



**Grant Number:** 2U01CA033193-34  
**FAIN:** U01CA033193

**Principal Investigator(s):**  
Kurt Straif

**Project Title:** Evaluation of Carcinogenic Risks to Humans

Dr. Kelm, Olaf  
Head of Grants Office  
150 cours Albert Thomas  
Lyon, 69008  
FRA

**Award e-mailed to:** igo@iarc.fr

**Period Of Performance:**  
**Budget Period:** 09/10/2015 – 08/31/2016  
**Project Period:** 09/01/1985 – 08/31/2020

Dear Business Official:

The National Institutes of Health hereby awards a grant in the amount of \$828,046 (see “Award Calculation” in Section I and “Terms and Conditions” in Section III) to INTERNATIONAL AGENCY FOR RES ON CANCER in support of the above referenced project. This award is pursuant to the authority of 42 USC 241 31 USC 6305 42 CFR 52 and is subject to the requirements of this statute and regulation and of other referenced, incorporated or attached terms and conditions.

Acceptance of this award including the “Terms and Conditions” is acknowledged by the grantee when funds are drawn down or otherwise obtained from the grant payment system.

Each publication, press release, or other document about research supported by an NIH award must include an acknowledgment of NIH award support and a disclaimer such as “Research reported in this publication was supported by the National Cancer Institute of the National Institutes of Health under Award Number U01CA033193. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.” Prior to issuing a press release concerning the outcome of this research, please notify the NIH awarding IC in advance to allow for coordination.

Award recipients must promote objectivity in research by establishing standards that provide a reasonable expectation that the design, conduct and reporting of research funded under NIH awards will be free from bias resulting from an Investigator’s Financial Conflict of Interest (FCOI), in accordance with the 2011 revised regulation at 42 CFR Part 50 Subpart F. The Institution shall submit all FCOI reports to the NIH through the eRA Commons FCOI Module. The regulation does not apply to Phase I Small Business Innovative Research (SBIR) and Small Business Technology Transfer (STTR) awards. Consult the NIH website <http://grants.nih.gov/grants/policy/coi/> for a link to the regulation and additional important information.

If you have any questions about this award, please contact the individual(s) referenced in Section IV.

Sincerely yours,

Joy Kears  
Grants Management Officer  
NATIONAL CANCER INSTITUTE

Additional information follows

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**SECTION I – AWARD DATA – 2U01CA033193-34****Award Calculation (U.S. Dollars)**

Salaries and Wages	\$448,529
Fringe Benefits	\$118,851
Personnel Costs (Subtotal)	\$567,380
Other Costs	\$165,427

Federal Direct Costs	\$732,807
Federal F&A Costs	\$95,265
Approved Budget	\$828,072
Total Amount of Federal Funds Obligated (Federal Share)	\$828,072
Less Unobligated Balance	\$26
<b>TOTAL FEDERAL AWARD AMOUNT</b>	<b>\$828,046</b>

**AMOUNT OF THIS ACTION (FEDERAL SHARE)** \$828,046

SUMMARY TOTALS FOR ALL YEARS		
YR	THIS AWARD	CUMULATIVE TOTALS
34	\$828,046	\$828,046
35	(b)(5)	
36		
37		
38		

Recommended future year total cost support, subject to the availability of funds and satisfactory progress of the project

**Fiscal Information:**

**CFDA Name:** Cancer Cause and Prevention Research  
**CFDA Number:** 93.393  
**EIN:** 1900210016A1  
**Document Number:** UCA033193I  
**PMS Account Type:** B (Subaccount)  
**Fiscal Year:** 2015

IC	CAN	2015	2016	2017	2018	2019
CA	8479565	\$828,046	(b)(5)			

Recommended future year total cost support, subject to the availability of funds and satisfactory progress of the project

**NIH Administrative Data:**

**PCC:** Y7DC / **OC:** 414M / **Released:** KEARSEJ 09/03/2015  
**Award Processed:** 06/15/2015 11:31:44 PM

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**SECTION II – PAYMENT/HOTLINE INFORMATION – 2U01CA033193-34**

For payment and HHS Office of Inspector General Hotline information, see the NIH Home Page at <http://grants.nih.gov/grants/policy/awardconditions.htm>

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**SECTION III – TERMS AND CONDITIONS – 2U01CA033193-34**

This award is based on the application submitted to, and as approved by, NIH on the above-titled project and is subject to the terms and conditions incorporated either directly or by reference in the following:

- The grant program legislation and program regulation cited in this Notice of Award.
- Conditions on activities and expenditure of funds in other statutory requirements, such as those included in appropriations acts.
- 45 CFR Part 75.
- National Policy Requirements and all other requirements described in the NIH Grants

- Policy Statement, including addenda in effect as of the beginning date of the budget period.
- e. Federal Award Performance Goals: As required by the periodic report in the RPPR or in the final progress report when applicable.
  - f. This award notice, INCLUDING THE TERMS AND CONDITIONS CITED BELOW.

(See NIH Home Page at <http://grants.nih.gov/grants/policy/awardconditions.htm> for certain references cited above.)

**Research and Development (R&D):** All awards issued by the National Institutes of Health (NIH) meet the definition of “Research and Development” at 45 CFR Part§ 75.2. As such, auditees should identify NIH awards as part of the R&D cluster on the Schedule of Expenditures of Federal Awards (SEFA). The auditor should test NIH awards for compliance as instructed in Part V, Clusters of Programs. NIH recognizes that some awards may have another classification for purposes of indirect costs. The auditor is not required to report the disconnect (i.e., the award is classified as R&D for Federal Audit Requirement purposes but non-research for indirect cost rate purposes), unless the auditee is charging indirect costs at a rate other than the rate(s) specified in the award document(s).

Carry over of an unobligated balance into the next budget period requires Grants Management Officer prior approval.

This award is subject to the requirements of 2 CFR Part 25 for institutions to receive a Dun & Bradstreet Universal Numbering System (DUNS) number and maintain an active registration in the System for Award Management (SAM). Should a consortium/subaward be issued under this award, a DUNS requirement must be included. See <http://grants.nih.gov/grants/policy/awardconditions.htm> for the full NIH award term implementing this requirement and other additional information.

This award has been assigned the Federal Award Identification Number (FAIN) U01CA033193. Recipients must document the assigned FAIN on each consortium/subaward issued under this award.

This award is not subject to the Transparency Act subaward and executive compensation reporting requirement of 2 CFR Part 170.

In accordance with P.L. 110-161, compliance with the NIH Public Access Policy is now mandatory. For more information, see NOT-OD-08-033 and the Public Access website: <http://publicaccess.nih.gov/>.

**Treatment of Program Income:**  
Additional Costs

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**SECTION IV – CA Special Terms and Conditions – 2U01CA033193-34**

**REQUIREMENT:** This award is issued as a cooperative agreement, a financial assistance mechanism in which substantial NIH scientific and/or programmatic involvement is anticipated in the performance of the activity. This award is subject to the Terms and Conditions of Award below, which are hereby incorporated by reference as special terms and conditions of this award.

**Cooperative Agreement Terms and Conditions of Award**

The following special terms of award are in addition to, and not in lieu of, otherwise applicable U.S. Office of Management and Budget (OMB) administrative guidelines, U.S. Department of Health and Human Services (DHHS) grant administration regulations at 45 CFR Parts 74 and 92 (Part 92 is applicable when State and local Governments are eligible to apply), and other HHS, PHS, and NIH grant administration policies.

The administrative and funding instrument used for this program will be the cooperative agreement, an "assistance" mechanism (rather than an "acquisition" mechanism), in which substantial NIH programmatic involvement with the awardees is anticipated during the performance of the activities. Under the cooperative agreement, the NIH purpose is to support and stimulate the recipients' activities by involvement in and otherwise working jointly with the award recipients in a partnership role; it is not to assume direction, prime responsibility, or a dominant role in the activities. Consistent with this concept, the dominant role and prime responsibility resides with the awardees for the project as a whole, although specific tasks and activities may be shared among the awardees and the NIH as defined below.

**The PD(s)/PI(s) will have the primary responsibility for:**

The PD/PI will have the primary responsibility for defining objectives and approaches, and for planning, conducting, analyzing, and publishing results, interpretations, and conclusions from the project. The PD/PI assumes responsibility and accountability to the applicant organization officials and to the NCI for the performance and proper conduct of the research activities in accordance with terms and conditions of the award.

*Specific activities include:*

- Planning, coordinating, and overseeing the activities for organizing and convening Advisory and Working Groups, and preparation of Monograph volumes;
- Selecting experts to serve on the multidisciplinary Advisory and Working Groups to engender balanced viewpoints and high scientific rigor while avoiding conflicts of interest;
- Conducting pre-meeting activities including systematic literature reviews and review of preliminary subgroup working papers;
- Convening Working Group meetings, facilitating review of subgroup papers and developing consensus drafts of findings;
- Conducting post-meeting activities to ensure the accuracy and clarity of the final Monograph text and rapid dissemination of the findings;
- Providing logistical and administrative support for all activities of Advisory and Working groups;
- Implementing methods to improve the transparency and efficiency of literature selection and review as well as incorporate public datasets to support evaluations;
- Collaborating with relevant health agencies and institutions globally to share methods to improve systematic review, carcinogen assessment, and data harmonization and accessibility; and
- Providing information to the NCI Program Official concerning progress by submitting annual progress report in a standard format.

Awardees will retain custody of and have primary rights to the data and software developed under these awards, subject to Government rights of access consistent with current DHHS, PHS, and NIH policies.

**NIH staff will have substantial programmatic involvement that is above and beyond the normal stewardship role in awards, as described below:**

A designated NCI Program staff member, acting as a Project Scientist, will have substantial programmatic involvement that is above and beyond the normal stewardship role in awards. The NCI Project Scientist will not attend peer review meetings of renewal or supplemental applications. If such participation is essential, this individual will seek a waiver according to the NCI procedures for management of conflict of interest.

The responsibilities of the NCI Project Scientist will include the following aspects:

- Monitoring the performance of the IARC Monographs program and making recommendations to the NCI on the allocation of funds; and
- Serving as a liaison between the IARC Monographs program and other NCI and NIH programs to stimulate broader interactions, disseminate results and leverage existing NIH resources and infrastructures.

The NCI reserves the right to adjust funding, withhold, suspend, or terminate the support to the IARC Monographs project awardee institution if the awardee is unable to meet the performance requirements set forth in these Terms and Conditions of Award, or significantly changes the level of performance.

An NCI Program staff member, acting as the Program Official, will be responsible for the normal scientific and programmatic stewardship of the award and will be named in the award notice. If this individual becomes substantially involved in the IARC Monographs program activities, he/she will not attend peer review meetings of renewal and/or supplemental applications or will seek NCI waiver if such participation is essential.

**Areas of Joint Responsibility include:**

- None; all responsibilities are divided between awardees and NIH staff as described above.

**Dispute Resolution:**

Any disagreements that may arise in scientific or programmatic matters (within the scope of the award) between award recipients and the NIH may be brought to Dispute Resolution. A Dispute Resolution Panel composed of three members will be convened. It will have three members: a designee of the Steering Committee chosen without NIH staff voting, one NIH designee, and a third designee with expertise in the relevant area who is chosen by the other two; in the case of individual disagreement, the first member may be chosen by the individual awardee. This special dispute resolution procedure does not alter the awardee's right to appeal an adverse action that is otherwise appealable in accordance with PHS regulation 42 CFR Part 50, Subpart D and DHHS regulation 45 CFR Part 16.

**INFORMATION:** Although the budget period start date for this award is 9/10/15, this award includes funds for twelve months of support. Future year budget periods will cycle on September 1<sup>st</sup>. Allowable preaward costs may be charged to this award, in accordance with the conditions in the NIH Grants Policy Statement, (March 2015), and with institutional requirements for prior approval. A link to the NIH GPS is available through the following NIH Guide Notice:<http://grants.nih.gov/grants/guide/notice-files/NOT-OD-15-087.html>

**INFORMATION:** In accordance with the National Cancer Institute's (NCI) policy, "Policy for Allowable Requested Budget Levels of Renewal (Type 2) R01, U01 and P01 Applications" announced in the NIH Guide for Grants and Contracts on August 15, 2008: ([NOT-CA-08-026](#),) the allowable Type 2 Cap for this award has been calculated at \$814,230 direct. In accordance with the National Cancer Institute's (NCI's) Fiscal Year (FY) 2015 funding policies, this award has been issued at 90% of the allowable Type 2 cap level. \*Spreadsheets used to calculate this award are available upon request.

**INFORMATION:** Future year total cost commitments appearing on the award notice under "Recommended Future Year Total Cost Support" have been calculated by applying the negotiated facilities and administrative cost rate(s) in effect at the time of this FY2015 award to the committed total direct cost level for each future year.

**INFORMATION:** The policies and procedures announced in Guide Notice NOT-OD-12-139, <http://grants.nih.gov/grants/guide/notice-files/NOT-OD-12-139.html> apply to this award.

**INFORMATION:** This award utilizes the unobligated balance from the 32- year Federal Financial Report as an offset in the amount of \$26.

**INFORMATION:** This award, including the budget and the budget period, has been discussed between Joy Kearse of the National Cancer Institute and Dr. Olaf Kelm on 8/26/15.

**STAFF CONTACTS**

The Grants Management Specialist is responsible for the negotiation, award and administration of this project and for interpretation of Grants Administration policies and provisions. The Program Official is responsible for the scientific, programmatic and technical aspects of this project. These individuals work together in overall project administration. Prior approval requests (signed by an Authorized Organizational Representative) should be submitted in writing to the Grants Management Specialist. Requests may be made via e-mail.

**Grants Management Specialist:** Joy Kearse  
**Email:** kearsej@mail.nih.gov **Phone:** 301-631-3002 **Fax:** 301-451-5391

Program Official: Ronald L Johnson  
Email: rjohnso2@mail.nih.gov Phone: 240-276-6250

**SPREADSHEET SUMMARY**  
**GRANT NUMBER: 2U01CA033193-34**

**INSTITUTION: INTERNATIONAL AGENCY FOR RES ON CANCER**

Budget	Year 34	Year 35	Year 36	Year 37	Year 38
Salaries and Wages	\$448,529	(b)(5)			
Fringe Benefits	\$118,851				
Personnel Costs (Subtotal)	\$567,380				
Other Costs	\$165,427				
TOTAL FEDERAL DC	\$732,807				
TOTAL FEDERAL F&A	\$95,265				
TOTAL COST	\$828,046				

Facilities and Administrative Costs	Year 34	Year 35	Year 36	Year 37	Year 38
F&A Cost Rate 1	13%	(b)(5)			
F&A Cost Base 1	\$732,807				
F&A Costs 1	\$95,265				



**Grant Number:** 2U01CA033193-34 REVISED  
**FAIN:** U01CA033193

**Principal Investigator(s):**  
Kurt Straif

**Project Title:** Evaluation of Carcinogenic Risks to Humans

Dr. Kelm, Olaf  
Head of Grants Office  
150 cours Albert Thomas  
Lyon, 69008  
FRA

**Award e-mailed to:** igo@iarc.fr

**Period Of Performance:**  
**Budget Period:** 09/10/2015 – 08/31/2016  
**Project Period:** 09/01/1985 – 08/31/2020

Dear Business Official:

The National Institutes of Health hereby revises this award (see “Award Calculation” in Section I and “Terms and Conditions” in Section III) to INTERNATIONAL AGENCY FOR RESEARCH ON CANCER in support of the above referenced project. This award is pursuant to the authority of 42 USC 241 31 USC 6305 42 CFR 52 and is subject to the requirements of this statute and regulation and of other referenced, incorporated or attached terms and conditions.

Acceptance of this award including the “Terms and Conditions” is acknowledged by the grantee when funds are drawn down or otherwise obtained from the grant payment system.

Each publication, press release, or other document about research supported by an NIH award must include an acknowledgment of NIH award support and a disclaimer such as “Research reported in this publication was supported by the National Cancer Institute of the National Institutes of Health under Award Number U01CA033193. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.” Prior to issuing a press release concerning the outcome of this research, please notify the NIH awarding IC in advance to allow for coordination.

Award recipients must promote objectivity in research by establishing standards that provide a reasonable expectation that the design, conduct and reporting of research funded under NIH awards will be free from bias resulting from an Investigator’s Financial Conflict of Interest (FCOI), in accordance with the 2011 revised regulation at 42 CFR Part 50 Subpart F. The Institution shall submit all FCOI reports to the NIH through the eRA Commons FCOI Module. The regulation does not apply to Phase I Small Business Innovative Research (SBIR) and Small Business Technology Transfer (STTR) awards. Consult the NIH website <http://grants.nih.gov/grants/policy/coi/> for a link to the regulation and additional important information.

If you have any questions about this award, please contact the individual(s) referenced in Section IV.

Sincerely yours,

Joy Kears  
Grants Management Officer  
NATIONAL CANCER INSTITUTE

Additional information follows

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**SECTION I – AWARD DATA – 2U01CA033193-34 REVISED****Award Calculation (U.S. Dollars)**

Salaries and Wages	\$448,529
Fringe Benefits	\$118,851
Personnel Costs (Subtotal)	\$567,380
Other Costs	\$165,427

Federal Direct Costs	\$732,807
Federal F&A Costs	\$95,265
Approved Budget	\$828,072
Total Amount of Federal Funds Obligated (Federal Share)	\$828,072
Less Unobligated Balance	\$26
<b>TOTAL FEDERAL AWARD AMOUNT</b>	<b>\$828,046</b>

**AMOUNT OF THIS ACTION (FEDERAL SHARE) \$0**

SUMMARY TOTALS FOR ALL YEARS		
YR	THIS AWARD	CUMULATIVE TOTALS
34	\$828,046	\$828,046
35	(b)(5)	
36		
37		
38		

Recommended future year total cost support, subject to the availability of funds and satisfactory progress of the project

**Fiscal Information:**

**CFDA Name:** Cancer Cause and Prevention Research  
**CFDA Number:** 93.393  
**EIN:** 1900210016A1  
**Document Number:** UCA033193I  
**PMS Account Type:** B (Subaccount)  
**Fiscal Year:** 2015

IC	CAN	2015	2016	2017	2018	2019
CA	8479565	\$828,046	(b)(5)			

Recommended future year total cost support, subject to the availability of funds and satisfactory progress of the project

**NIH Administrative Data:**

**PCC:** Y7DC / **OC:** 414M / **Released:** KEARSEJ 09/16/2015  
**Award Processed:** 06/15/2015 11:31:44 PM

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**SECTION II – PAYMENT/HOTLINE INFORMATION – 2U01CA033193-34 REVISED**

For payment and HHS Office of Inspector General Hotline information, see the NIH Home Page at <http://grants.nih.gov/grants/policy/awardconditions.htm>

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**SECTION III – TERMS AND CONDITIONS – 2U01CA033193-34 REVISED**

This award is based on the application submitted to, and as approved by, NIH on the above-titled project and is subject to the terms and conditions incorporated either directly or by reference in the following:

- The grant program legislation and program regulation cited in this Notice of Award.
- Conditions on activities and expenditure of funds in other statutory requirements, such as those included in appropriations acts.
- 45 CFR Part 75.
- National Policy Requirements and all other requirements described in the NIH Grants

- Policy Statement, including addenda in effect as of the beginning date of the budget period.
- e. Federal Award Performance Goals: As required by the periodic report in the RPPR or in the final progress report when applicable.
  - f. This award notice, INCLUDING THE TERMS AND CONDITIONS CITED BELOW.

(See NIH Home Page at <http://grants.nih.gov/grants/policy/awardconditions.htm> for certain references cited above.)

**Research and Development (R&D):** All awards issued by the National Institutes of Health (NIH) meet the definition of “Research and Development” at 45 CFR Part§ 75.2. As such, auditees should identify NIH awards as part of the R&D cluster on the Schedule of Expenditures of Federal Awards (SEFA). The auditor should test NIH awards for compliance as instructed in Part V, Clusters of Programs. NIH recognizes that some awards may have another classification for purposes of indirect costs. The auditor is not required to report the disconnect (i.e., the award is classified as R&D for Federal Audit Requirement purposes but non-research for indirect cost rate purposes), unless the auditee is charging indirect costs at a rate other than the rate(s) specified in the award document(s).

Carry over of an unobligated balance into the next budget period requires Grants Management Officer prior approval.

This award is subject to the requirements of 2 CFR Part 25 for institutions to receive a Dun & Bradstreet Universal Numbering System (DUNS) number and maintain an active registration in the System for Award Management (SAM). Should a consortium/subaward be issued under this award, a DUNS requirement must be included. See <http://grants.nih.gov/grants/policy/awardconditions.htm> for the full NIH award term implementing this requirement and other additional information.

This award has been assigned the Federal Award Identification Number (FAIN) U01CA033193. Recipients must document the assigned FAIN on each consortium/subaward issued under this award.

This award is not subject to the Transparency Act subaward and executive compensation reporting requirement of 2 CFR Part 170.

In accordance with P.L. 110-161, compliance with the NIH Public Access Policy is now mandatory. For more information, see NOT-OD-08-033 and the Public Access website: <http://publicaccess.nih.gov/>.

**Treatment of Program Income:**  
Additional Costs

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**SECTION IV – CA Special Terms and Conditions – 2U01CA033193-34 REVISED**

**INFORMATION:** This award corrects the F&A amount for the 38-Year. No action by the awardee is required.

THE FOLLOWING TERMS FROM THE PREVIOUS NOTICE OF GRANT AWARD ISSUED ON 9/10/15 ALSO APPLY TO THIS AWARD:

**REQUIREMENT:** This award is issued as a cooperative agreement, a financial assistance mechanism in which substantial NIH scientific and/or programmatic involvement is anticipated in

the performance of the activity. This award is subject to the Terms and Conditions of Award below, which are hereby incorporated by reference as special terms and conditions of this award.

#### Cooperative Agreement Terms and Conditions of Award

The following special terms of award are in addition to, and not in lieu of, otherwise applicable U.S. Office of Management and Budget (OMB) administrative guidelines, U.S. Department of Health and Human Services (DHHS) grant administration regulations at 45 CFR Parts 74 and 92 (Part 92 is applicable when State and local Governments are eligible to apply), and other HHS, PHS, and NIH grant administration policies.

The administrative and funding instrument used for this program will be the cooperative agreement, an "assistance" mechanism (rather than an "acquisition" mechanism), in which substantial NIH programmatic involvement with the awardees is anticipated during the performance of the activities. Under the cooperative agreement, the NIH purpose is to support and stimulate the recipients' activities by involvement in and otherwise working jointly with the award recipients in a partnership role; it is not to assume direction, prime responsibility, or a dominant role in the activities. Consistent with this concept, the dominant role and prime responsibility resides with the awardees for the project as a whole, although specific tasks and activities may be shared among the awardees and the NIH as defined below.

#### **The PD(s)/PI(s) will have the primary responsibility for:**

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#### *Specific activities include:*

- Planning, coordinating, and overseeing the activities for organizing and convening Advisory and Working Groups, and preparation of Monograph volumes;
- Selecting experts to serve on the multidisciplinary Advisory and Working Groups to engender balanced viewpoints and high scientific rigor while avoiding conflicts of interest;
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- Convening Working Group meetings, facilitating review of subgroup papers and developing consensus drafts of findings;
- Conducting post-meeting activities to ensure the accuracy and clarity of the final Monograph text and rapid dissemination of the findings;
- Providing logistical and administrative support for all activities of Advisory and Working groups;
- Implementing methods to improve the transparency and efficiency of literature selection and review as well as incorporate public datasets to support evaluations;
- Collaborating with relevant health agencies and institutions globally to share methods to improve systematic review, carcinogen assessment, and data harmonization and accessibility; and
- Providing information to the NCI Program Official concerning progress by submitting annual progress report in a standard format.

Awardees will retain custody of and have primary rights to the data and software developed under these awards, subject to Government rights of access consistent with current DHHS, PHS, and NIH policies.

#### **NIH staff will have substantial programmatic involvement that is above and beyond the normal stewardship role in awards, as described below:**

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The responsibilities of the NCI Project Scientist will include the following aspects:

- Monitoring the performance of the IARC Monographs program and making recommendations to the NCI on the allocation of funds; and
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The NCI reserves the right to adjust funding, withhold, suspend, or terminate the support to the IARC Monographs project awardee institution if the awardee is unable to meet the performance requirements set forth in these Terms and Conditions of Award, or significantly changes the level of performance.

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**Areas of Joint Responsibility include:**

- None; all responsibilities are divided between awardees and NIH staff as described above.

**Dispute Resolution:**

Any disagreements that may arise in scientific or programmatic matters (within the scope of the award) between award recipients and the NIH may be brought to Dispute Resolution. A Dispute Resolution Panel composed of three members will be convened. It will have three members: a designee of the Steering Committee chosen without NIH staff voting, one NIH designee, and a third designee with expertise in the relevant area who is chosen by the other two; in the case of individual disagreement, the first member may be chosen by the individual awardee. This special dispute resolution procedure does not alter the awardee's right to appeal an adverse action that is otherwise appealable in accordance with PHS regulation 42 CFR Part 50, Subpart D and DHHS regulation 45 CFR Part 16.

**INFORMATION:** Although the budget period start date for this award is 9/10/15, this award includes funds for twelve months of support. Future year budget periods will cycle on September 1<sup>st</sup>. Allowable preaward costs may be charged to this award, in accordance with the conditions in the NIH Grants Policy Statement, (March 2015), and with institutional requirements for prior approval. A link to the NIH GPS is available through the following NIH Guide Notice: <http://grants.nih.gov/grants/guide/notice-files/NOT-OD-15-087.html>

**INFORMATION:** In accordance with the National Cancer Institute's (NCI) policy, "Policy for Allowable Requested Budget Levels of Renewal (Type 2) R01, U01 and P01 Applications" announced in the NIH Guide for Grants and Contracts on August 15, 2008: ([NOT-CA-08-026](#)), the allowable Type 2 Cap for this award has been calculated at \$814,230 direct. In accordance with the National Cancer Institute's (NCI's) Fiscal Year (FY) 2015 funding policies, this award has been issued at 90% of the allowable Type 2 cap level. \*Spreadsheets used to calculate this award are available upon request.

**INFORMATION:** Future year total cost commitments appearing on the award notice under "Recommended Future Year Total Cost Support" have been calculated by applying the negotiated facilities and administrative cost rate(s) in effect at the time of this FY2015 award to the committed total direct cost level for each future year.

**INFORMATION:** The policies and procedures announced in Guide Notice NOT-OD-12-139, <http://grants.nih.gov/grants/guide/notice-files/NOT-OD-12-139.html> apply to this award.

**INFORMATION:** This award utilizes the unobligated balance from the 32- year Federal Financial Report as an offset in the amount of \$26.

**INFORMATION:** This award, including the budget and the budget period, has been discussed between Joy Kearse of the National Cancer Institute and Dr. Olaf Kelm on 8/26/15.

**STAFF CONTACTS**

The Grants Management Specialist is responsible for the negotiation, award and administration of this project and for interpretation of Grants Administration policies and provisions. The Program Official is responsible for the scientific, programmatic and technical aspects of this project. These individuals work together in overall project administration. Prior approval requests (signed by an Authorized Organizational Representative) should be submitted in writing to the Grants Management Specialist. Requests may be made via e-mail.

**Grants Management Specialist:** Joy Kearse  
**Email:** kearsej@mail.nih.gov **Phone:** 301-631-3002 **Fax:** 301-451-5391

**Program Official:** Ronald L Johnson  
**Email:** rjohnso2@mail.nih.gov **Phone:** 240-276-6250

**SPREADSHEET SUMMARY**  
**GRANT NUMBER:** 2U01CA033193-34 REVISED

**INSTITUTION:** INTERNATIONAL AGENCY FOR RES ON CANCER

Budget	Year 34	Year 35	Year 36	Year 37	Year 38
Salaries and Wages	\$448,529	(b)(5)			
Fringe Benefits	\$118,851				
Personnel Costs (Subtotal)	\$567,380				
Other Costs	\$165,427				
TOTAL FEDERAL DC	\$732,807				
TOTAL FEDERAL F&A	\$95,265				
TOTAL COST	\$828,046				

Facilities and Administrative Costs	Year 34	Year 35	Year 36	Year 37	Year 38
F&A Cost Rate 1	13%	(b)(5)			
F&A Cost Base 1	\$732,807				
F&A Costs 1	\$95,265				



APPLICATION FOR FEDERAL ASSISTANCE  
**SF 424 (R&R)**

<b>3. DATE RECEIVED BY STATE</b>		<b>State Application Identifier</b>
<b>1. TYPE OF SUBMISSION*</b>		<b>4.a. Federal Identifier</b> CA033193
<input type="radio"/> Pre-application <input checked="" type="radio"/> Application <input type="radio"/> Changed/Corrected Application		<b>b. Agency Routing Number</b>
<b>2. DATE SUBMITTED</b>	<b>Application Identifier</b>	<b>c. Previous Grants.gov Tracking Number</b>
<b>5. APPLICANT INFORMATION</b>		<b>Organizational DUNS*: 279551881</b>
Legal Name*:	International Agency for Research on Cancer	
Department:	IARC Monographs	
Division:		
Street1*:	150 cours Albert Thomas	
Street2:		
City*:	Lyon	
County:		
State*:		
Province:		
Country*:	FRA: FRANCE	
ZIP / Postal Code*:	69008	
Person to be contacted on matters involving this application		
Prefix: Dr.	First Name*: Olaf	Middle Name: Last Name*: Kelm      Suffix:
Position/Title:	Head of Grants Office	
Street1*:	150 cours Albert Thomas	
Street2:		
City*:	Lyon	
County:		
State*:		
Province:		
Country*:	FRA: FRANCE	
ZIP / Postal Code*:	69008	
Phone Number*:	Fax Number:	Email:
+33 4 7273 8494	+33 4 7273 8394	igo@iarc.fr
<b>6. EMPLOYER IDENTIFICATION NUMBER (EIN) or (TIN)*</b>		1900210016A1
<b>7. TYPE OF APPLICANT*</b>		W: Non-domestic (non-US) Entity
Other (Specify):		
<input checked="" type="radio"/> Small Business Organization Type <input type="radio"/> Women Owned <input type="radio"/> Socially and Economically Disadvantaged		
<b>8. TYPE OF APPLICATION*</b>		If Revision, mark appropriate box(es).
<input type="radio"/> New <input type="radio"/> Resubmission <input checked="" type="radio"/> Renewal <input type="radio"/> Continuation <input type="radio"/> Revision		<input type="radio"/> A. Increase Award <input type="radio"/> B. Decrease Award <input type="radio"/> C. Increase Duration <input type="radio"/> D. Decrease Duration <input type="radio"/> E. Other (specify) :
<b>Is this application being submitted to other agencies?*</b> <input type="radio"/> Yes <input checked="" type="radio"/> No      What other Agencies?		
<b>9. NAME OF FEDERAL AGENCY*</b> National Institutes of Health		<b>10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER TITLE:</b>
<b>11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT*</b> Evaluation of Carcinogenic Risks to Humans		
<b>12. PROPOSED PROJECT</b>		<b>13. CONGRESSIONAL DISTRICTS OF APPLICANT</b>
Start Date* 09/01/2015	Ending Date* 08/31/2020	00-000

**14. PROJECT DIRECTOR/PRINCIPAL INVESTIGATOR CONTACT INFORMATION**

Prefix: Dr. First Name\*: Kurt Middle Name: Last Name\*: Straif Suffix:  
 Position/Title: Head, IARC Monographs Section  
 Organization Name\*: International Agency for Research on Cancer  
 Department: IARC Monographs  
 Division:  
 Street1\*: 150 cours Albert Thomas  
 Street2:  
 City\*: Lyon  
 County:  
 State\*:  
 Province:  
 Country\*: FRA: FRANCE  
 ZIP / Postal Code\*: 69008  
 Phone Number\*: +33 4 7273 8511 Fax Number: +33 4 7273 8319 Email\*: straifk@iarc fr

**15. ESTIMATED PROJECT FUNDING**

a. Total Federal Funds Requested\* \$4,295,000.00  
 b. Total Non-Federal Funds\* \$0.00  
 c. Total Federal & Non-Federal Funds\* \$4,295,000.00  
 d. Estimated Program Income\* \$0.00

**16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS?\***

a. YES  THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON:  
 DATE:  
 b. NO  PROGRAM IS NOT COVERED BY E.O. 12372; OR  
 PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW

**17. By signing this application, I certify (1) to the statements contained in the list of certifications\* and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances \* and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 18, Section 1001)**

I agree\*

\* The list of certifications and assurances, or an Internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

**18. SFLL or OTHER EXPLANATORY DOCUMENTATION**

File Name:

**19. AUTHORIZED REPRESENTATIVE**

Prefix: Dr. First Name\*: Christopher Middle Name: Last Name\*: Wild Suffix:  
 Position/Title\*: Director  
 Organization Name\*: International Agency for Research on Cancer  
 Department: Director's Office  
 Division:  
 Street1\*: 150 cours Albert Thomas  
 Street2:  
 City\*: Lyon  
 County:  
 State\*:  
 Province:  
 Country\*: FRA: FRANCE  
 ZIP / Postal Code\*: 69008  
 Phone Number\*: +33 4 7273 8485 Fax Number: +33 4 7273 8575 Email\*: director@iarc fr

Signature of Authorized Representative\*

Christopher Wild

Date Signed\*

12/17/2014

**20. PRE-APPLICATION** File Name:**21. COVER LETTER ATTACHMENT** File Name:1258-Cover Letter.pdf

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## Project/Performance Site Location(s)

### Project/Performance Site Primary Location

I am submitting an application as an individual, and not on behalf of a company, state, local or tribal government, academia, or other type of organization.

Organization Name: International Agency for Research on Cancer  
Duns Number: 2795518810000  
Street1\*: 150 cours Albert Thomas  
Street2:  
City\*: Lyon  
County:  
State\*:  
Province:  
Country\*: FRA: FRANCE  
Zip / Postal Code\*: 69008  
Project/Performance Site Congressional District\*: 00-000

---

File Name

### Additional Location(s)

## RESEARCH & RELATED Other Project Information

<b>1. Are Human Subjects Involved?*</b> <input type="radio"/> Yes <input checked="" type="radio"/> No	
1.a. If YES to Human Subjects Is the Project Exempt from Federal regulations? <input type="radio"/> Yes <input type="radio"/> No If YES, check appropriate exemption number:      — 1 — 2 — 3 — 4 — 5 — 6 If NO, is the IRB review Pending? <input type="radio"/> Yes <input type="radio"/> No IRB Approval Date: Human Subject Assurance Number	
<b>2. Are Vertebrate Animals Used?*</b> <input type="radio"/> Yes <input checked="" type="radio"/> No	
2.a. If YES to Vertebrate Animals Is the IACUC review Pending? <input type="radio"/> Yes <input type="radio"/> No IACUC Approval Date: Animal Welfare Assurance Number	
<b>3. Is proprietary/privileged information included in the application?*</b> <input type="radio"/> Yes <input checked="" type="radio"/> No	
<b>4.a. Does this project have an actual or potential impact - positive or negative - on the environment?*</b> <input type="radio"/> Yes <input checked="" type="radio"/> No	
4.b. If yes, please explain: 4.c. If this project has an actual or potential impact on the environment, has an exemption been authorized or an environmental assessment (EA) or environmental impact statement (EIS) been performed? <input type="radio"/> Yes <input type="radio"/> No 4.d. If yes, please explain:	
<b>5. Is the research performance site designated, or eligible to be designated, as a historic place?*</b> <input type="radio"/> Yes <input checked="" type="radio"/> No	
5.a. If yes, please explain:	
<b>6. Does this project involve activities outside the United States or partnership with international collaborators?*</b> <input checked="" type="radio"/> Yes <input type="radio"/> No	
6.a. If yes, identify countries:	France
6.b. Optional Explanation:	The IARC is located in Lyon, France
<b>7. Project Summary/Abstract*</b>	Filename 1253-Abstract.pdf
<b>8. Project Narrative*</b>	1254-Narrative.pdf
<b>9. Bibliography &amp; References Cited</b>	1255-References.pdf
<b>10. Facilities &amp; Other Resources</b>	1256-Facilities and Other Resources.pdf
<b>11. Equipment</b>	1257-Equipment.pdf

**Abstract**

The IARC Monographs on the Evaluation of Carcinogenic Risks to Humans are an international evidence-based approach to carcinogen hazard identification initiated in 1971. The overall objective is to identify preventable causes of cancer. This is advanced by conducting authoritative evaluations of suspected carcinogens and disseminating the results through multiple media. Because a broad range of exposures may contribute to human cancer, carcinogen evaluations encompass environmental and occupational exposures, physical and biological agents, chemicals, complex mixtures and lifestyle factors. Almost 1000 agents have been evaluated to date, with 114 classified as carcinogenic and 352 as probably or possibly carcinogenic to humans. Agents are selected for evaluation based on evidence of human exposure, suspicion of carcinogenicity, and public health importance. Each IARC Monograph includes systematic reviews of the pertinent scientific literature and an evaluation of the weight of the evidence that an agent or exposure may be carcinogenic to humans. Monographs are developed by Working Groups selected on the principles of including the best-qualified experts and avoiding conflicts of interest. National and international health agencies use the IARC Monographs as a trustworthy source of scientific information and as the scientific basis for their efforts to control cancer. The specific aims of this project are to: organize at least 10 Monograph meetings to evaluate candidate carcinogenic agents of high global relevance and concern; convene Working Groups that are scientifically rigorous, respected, and free of conflict of interest; enhance the systematic search, evaluation and documentation of scientific data for carcinogen evaluations; advance the use of mechanistic data in carcinogen evaluations; promote wide dissemination of evaluation results and engage in collaborations with national and international organizations to improve the science and practice of evaluating potential carcinogens. Important new initiatives in the proposed project period are to: expand the spectrum of mechanistic data considered in making evaluations to additional data streams, such as high-throughput test results; further systematize the review of mechanistic data according to key characteristics of carcinogens; introduce new working procedures and Web-based tools to enhance the documentation of the search for and evaluation of relevant literature on cancer in humans, cancer in experimental animals, and relevant mechanisms.

## **Narrative**

The IARC Monographs Programme identifies preventable causes of cancer by conducting authoritative, internationally-respected evaluations of suspected carcinogens, encompassing environmental and occupational exposures, physical and biological agents, chemicals, complex mixtures and lifestyle factors, by expert working groups; and by disseminating the results in *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans* and through other media. This provides governments and health agencies worldwide with timely, trustworthy, authoritative scientific information to support actions to prevent cancer through control of exposure to known, probable, and possible carcinogens.

## Facilities and Other Resources

The proposed project will be conducted at the International Agency for Research on Cancer (IARC). The goals of the Agency are to describe the burden of cancer, identify the causes, and to develop approaches for early detection and prevention. The close working relationship between IARC and its parent organization, the World Health Organization (WHO), allows the research findings of the Agency to be translated effectively into timely policies for cancer control. IARC's unique position has led to development of large collaborative studies across different countries, and its inter-disciplinary nature brings together skills in epidemiology, laboratory sciences and biostatistics.

The Monographs Section is situated on the 5th floor of IARC's main building with 13 offices and two bibliography storage rooms allocated.

The IARC has excellent conference facilities, with multiple adjoining meeting rooms accommodating both plenary and sub-group sessions. Modern communications and audiovisual equipment is available, incl. microphones for all participants. GotoMeeting is used for pre-meeting conference calls with the Working Group members.

The IARC Library subscribes online to the major scientific cancer research journals, benefits from WHO Headquarters on-line subscriptions and has agreements with other scientific libraries.

The meeting rooms, library, staff offices, and cafeteria are all located in the main IARC building. This facilitates efficient conduct of the meetings.

IARC benefits from an Information and Communication Technology team with the capacity to maintain the large and complex computer network and to deal with specific needs and requests from scientific and administrative staff members and Working Group members.

A Communications team is available at IARC and supports the Monographs team with contacts with external printers and designers as well as with the organization of press conferences, press releases and other media contact as appropriate. The Communications team also includes a photographer.

IARC's multilingual staff can assist with on-the-spot translation of papers in virtually any language used for modern scientific publications.

A core part of the IARC's mission is education and training of cancer researchers worldwide, particularly in the area of cancer epidemiology. To achieve this, several courses and workshops are regularly organized. Some courses that have been offered in the past include the three-week Summer School in cancer registration and epidemiology, a week-long course in statistical practice in epidemiology with R, and a two-day biomedical research ethics course. The IARC supports international researchers in various stages of their career. All this contributes to the vibrant and collegial international research environment, which is unique to IARC. IARC also supports travel to at least one international meeting each year which provides an opportunity to present and discuss new research findings within the broader scientific community.

## **Equipment**

A sufficient number of PCs (20) and laptops (2) with appropriate software are available in the IARC Monographs section for carrying out the daily work, all connected to a centralized printer. Additional laptops and printers needed during Working Group meetings are available on loan from the Information Technology Services group. Additional printing capacity is also available from the Section of Support to Research before and during Working Group meetings.

PubMed and internet search engines are used for electronic retrieval, and Reference Manager for indexing and processing scientific literature.

Two state-of-the art web-based tools are being further developed and implemented, a modular systematic review tool for development of human health risk assessments and the IARC Table Builder, which was developed to address the IARC Monographs programme's needs for data capture, display and management, including secure access.

Pre- and post-meeting processing of Working Group documents is handled with Microsoft Office, InDesign, eXtyles and Typefi.

**RESEARCH & RELATED Senior/Key Person Profile (Expanded)**

PROFILE - Project Director/Principal Investigator				
Prefix: Dr.	First Name*: Kurt	Middle Name	Last Name*: Straif	Suffix:
Position/Title*:	Head, IARC Monographs Section			
Organization Name*:	International Agency for Research on Cancer			
Department:	IARC Monographs			
Division:				
Street1*:	150 cours Albert Thomas			
Street2:				
City*:	Lyon			
County:				
State*:				
Province:				
Country*:	FRA: FRANCE			
Zip / Postal Code*:	69008			
Phone Number*:	+33 4 7273 8511	Fax Number:	+33 4 7273 8319	E-Mail*: straik@iarc.fr
Credential, e.g., agency login:	(b) (4)			
Project Role*:	PD/PI	Other Project Role Category:		
Degree Type:	Degree Year:			
<b>Attach Biographical Sketch*:</b>	File Name		1240-Straif-biosketch_VerC.pdf	
<b>Attach Current &amp; Pending Support:</b>	File Name		1241-ResearchSupportStraif.pdf	

PROFILE - Senior/Key Person				
Prefix: Dr.	First Name*: Dana	Middle Name	Last Name*: Loomis	Suffix:
Position/Title*:	Deputy Head, IARC Monographs Section			
Organization Name*:	International Agency for Research on Cancer			
Department:	IARC Monographs			
Division:				
Street1*:	150 cours Albert Thomas			
Street2:				
City*:	Lyon			
County:				
State*:				
Province:				
Country*:	FRA: FRANCE			
Zip / Postal Code*:	69008			
Phone Number*: +33 4 7273 8049	Fax Number: +33 4 7273 8310	E-Mail*: loomisd@iarc.fr		
Credential, e.g., agency login	(b) (4)			
Project Role*: Co-Investigator	Other Project Role Category:			
Degree Type:	Degree Year:			
<b>Attach Biographical Sketch*:</b>	File Name 1242-Loomis_biosketch_VerC.pdf			
<b>Attach Current &amp; Pending Support:</b>	1243-ResearchSupportLoomis.pdf			

PROFILE - Senior/Key Person				
Prefix: Dr.	First Name*: Kathryn	Middle Name	Last Name*: Guyton	Suffix:
Position/Title*:	Scientist			
Organization Name*:	International Agency for Research on Cancer			
Department:	IARC Monographs			
Division:				
Street1*:	150 cours Albert Thomas			
Street2:				
City*:	Lyon			
County:				
State*:				
Province:				
Country*:	FRA: FRANCE			
Zip / Postal Code*:	69008			
Phone Number*: +33 4 7273 8654	Fax Number: +33 4 7273 8319	E-Mail*: guytonk@iarc fr		
Credential, e.g., agency login	(b)(4)			
Project Role*: Co-Investigator	Other Project Role Category:			
Degree Type:	Degree Year:			
<b>Attach Biographical Sketch*:</b>	File Name 1244-Guyton-biosketch_VerC.pdf			
<b>Attach Current &amp; Pending Support:</b>				

PROFILE - Senior/Key Person				
Prefix: Dr.	First Name*: Yann	Middle Name	Last Name*: Grosse	Suffix:
Position/Title*:	Scientist			
Organization Name*:	International Agency for Research on Cancer			
Department:	IARC Monographs			
Division:				
Street1*:	150 cours Albert Thomas			
Street2:				
City*:	France			
County:				
State*:				
Province:				
Country*:	FRA: FRANCE			
Zip / Postal Code*:	69008			
Phone Number*: +33 4 7273 8656	Fax Number: +33 4 7273 8319	E-Mail*: grossey@iarc fr		
Credential, e.g., agency login:				
Project Role*: Co-Investigator			Other Project Role Category:	
Degree Type:			Degree Year:	
			File Name	
<b>Attach Biographical Sketch*:</b>			1245-Grosse-biosketch_VerC.pdf	
<b>Attach Current &amp; Pending Support:</b>				

PROFILE - Senior/Key Person				
Prefix: Dr.	First Name*: B?atrice	Middle Name	Last Name*: Lauby-Secretan	Suffix:
Position/Title*:	Scientist			
Organization Name*:	International Agency for Research on Cancer			
Department:	IARC Monographs			
Division:				
Street1*:	150 cours Albert Thomas			
Street2:				
City*:	Lyon			
County:				
State*:				
Province:				
Country*:	FRA: FRANCE			
Zip / Postal Code*:	69008			
Phone Number*: +33 4 7273 8424	Fax Number: +33 4 7273 8319	E-Mail*: secretanb@iarc fr		
Credential, e.g., agency login:				
Project Role*: Co-Investigator			Other Project Role Category:	
Degree Type:			Degree Year:	
			File Name	
<b>Attach Biographical Sketch*:</b>			1246-Lauby-Secretan-biosketch_VerC.pdf	
<b>Attach Current &amp; Pending Support:</b>			1247-ResearchSupportLaubySecretan.pdf	

PROFILE - Senior/Key Person				
Prefix: Dr	First Name*: Heidi	Middle Name	Last Name*: Mattock	Suffix:
Position/Title*:	Editor			
Organization Name*:	International Agency for Research on Cancer			
Department:	IARC Monographs			
Division:				
Street1*:	150 cours Albert Thomas			
Street2:				
City*:	Lyon			
County:				
State*:				
Province:				
Country*:	FRA: FRANCE			
Zip / Postal Code*:	69008			
Phone Number*: + 33 4 7273 8420	Fax Number: +33 4 7273 8319	E-Mail*: mattockh@iarc.fr		
Credential, e.g., agency login:	(b)(4)			
Project Role*: Co-Investigator	Other Project Role Category:			
Degree Type:	Degree Year:			
	File Name			
<b>Attach Biographical Sketch*:</b>	1248-Mattock_biosketch_VerC.pdf			
<b>Attach Current &amp; Pending Support:</b>				

PROFILE - Senior/Key Person				
Prefix: Dr.	First Name*: V?ronique	Middle Name	Last Name*: Bouvard	Suffix:
Position/Title*:	Scientist			
Organization Name*:	International Agency for Research on Cancer			
Department:	IARC Monographs			
Division:				
Street1*:	150 cours Albert Thomas			
Street2:				
City*:	Lyon			
County:				
State*:				
Province:				
Country*:	FRA: FRANCE			
Zip / Postal Code*:	69008			
Phone Number*: +33 4 7273 8053	Fax Number: +33 4 7273 8319	E-Mail*: bouvardv@iarc.fr		
Credential, e.g., agency login:				
Project Role*: Co-Investigator	Other Project Role Category:			
Degree Type:	Degree Year:			
	File Name			
<b>Attach Biographical Sketch*:</b>	1249-Bouvard_biosketch_VerC.pdf			
<b>Attach Current &amp; Pending Support:</b>				

PROFILE - Senior/Key Person				
Prefix: Dr.	First Name*: Fatiha	Middle Name	Last Name*: El-Ghissassi	Suffix:
Position/Title*:	Scientist			
Organization Name*:	International Agency for Research on Cancer			
Department:	IARC Monographs			
Division:				
Street1*:	150 cours Albert Thomas			
Street2:				
City*:	Lyon			
County:				
State*:				
Province:				
Country*:	FRA: FRANCE			
Zip / Postal Code*:	69008			
Phone Number*: +33 4 7273 8526	Fax Number: +33 4 7273 8319	E-Mail*: elghissassif@iarc.fr		
Credential, e.g., agency login:				
Project Role*: Co-Investigator			Other Project Role Category:	
Degree Type:			Degree Year:	
<b>Attach Biographical Sketch*:</b>			File Name	
<b>Attach Current &amp; Pending Support:</b>			1250-El-Ghissassi-biosketch_VerC.pdf	

PROFILE - Senior/Key Person				
Prefix: Dr.	First Name*: Neela	Middle Name	Last Name*: Guha	Suffix:
Position/Title*:	Scientist			
Organization Name*:	International Agency for Research on Cancer			
Department:	IARC Monographs			
Division:				
Street1*:	150 cours Albert Thomas			
Street2:				
City*:	Lyon			
County:				
State*:				
Province:				
Country*:	FRA: FRANCE			
Zip / Postal Code*:	69008			
Phone Number*: +33 4 7273 8367	Fax Number:	E-Mail*: guhan@iarc fr		
Credential, e.g., agency login:				
Project Role*: Co-Investigator			Other Project Role Category:	
Degree Type:			Degree Year:	
<b>Attach Biographical Sketch*:</b>			File Name	
<b>Attach Current &amp; Pending Support:</b>			1251-Guha-biosketch_VerC.pdf	

PROFILE - Senior/Key Person				
Prefix: Dr.	First Name*: Lamia	Middle Name	Last Name*: Benbrahim-Tallaa	Suffix:
Position/Title*:	Scientist			
Organization Name*:	International Agency for Research on Cancer			
Department:	IARC Monographs			
Division:				
Street1*:	150 cours Albert Thomas			
Street2:				
City*:	Lyon			
County:				
State*:				
Province:				
Country*:	FRA: FRANCE			
Zip / Postal Code*:	69008			
Phone Number*:	+33 4 7273 8385	Fax Number:	+33 4 7273 8319	E-Mail*:
tallaal@iarc.fr				
Credential, e.g., agency login:	(b)(4)			
Project Role*:	Co-Investigator	Other Project Role Category:		
Degree Type:	Degree Year:			
<b>Attach Biographical Sketch*:</b>	File Name			
<b>Attach Current &amp; Pending Support:</b>	1252-Tallaa_biosketch_VerC.pdf			

**BIOGRAPHICAL SKETCH**

Provide the following information for the Senior/key personnel and other significant contributors.  
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME <b>STRAIF, Kurt</b>		POSITION TITLE Head, IARC Monographs Section International Agency for Research on Cancer Lyon, France	
eRA COMMONS USER NAME (credential, e.g., agency login) (b)(4)			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	MM/YY	FIELD OF STUDY
University of Bonn	B.A.	1984	Philosophy (Theory of Sci.)
University of Bonn, Medical School	M.D.	1984	Medicine
State Medical Chamber of North Rhine	Board Certification	1990	Internal Med./Oncology
UCLA, School of Public Health	M.P.H.	1991	Public Health
State Medical Chamber of Hestia	Board Certification	1994	Occupational Medicine
State Medical Chamber of Westphalia	Board Certification	1996	Social Medicine
State Medical Chamber of Westphalia	Board Certification	1996	Environmental Medicine
UCLA, School of Public Health	Ph.D.	2001	Epidemiology

**A. Personal Statement**

Dr Straif has worked for the IARC Monographs since 2001 and been Head of the program since 2010. His research spans the full breadth of environmental risk factors for cancer. He serves on several national and international committees on primary and secondary prevention of cancer; he is the Scientific Director of the IARC Summer School on Cancer Epidemiology.

**Positions and Honors****Employment**

1984-1990 Instructor and Fellow, Internal Medicine, Oncology, University of Bonn, Medical School  
 1991 Visiting Scientist, Dept. of Environmental Sciences, School of Public Health, Columbia University, New York  
 1991-1995 Fellow and Assistant Professor, Occupational and Social Medicine, University of Giessen  
 1995-2001 Assistant and Associate Professor, Head of Unit on Cancer and Occupational Epidemiology, Epidemiology and Social Medicine, University of Münster, Medical School  
 2001-2010 Senior Scientist, International Agency for Research on Cancer (IARC)  
 2009-2010 Acting Head, Lifestyle and Cancer Group, IARC  
 2010- Head, IARC Monographs Section

**Selected Post-Graduate Education**

06/1991 Risk assessment, Summer School, School of Public Health, Johns Hopkins University, Baltimore  
 05/1992 First International Course on Susceptibility in Occupational Toxicity, NIVA, Bergen, Norway  
 08/1993 Molecular Biology in Toxicology: Methods and Applications, NIVA, Helsinki, Finland  
 06/1995 Advanced Biostatistics for Epidemiologists, International Epidemiology Summer School, Münster, Germany  
 09/1998 Epidemiologic Analysis from a Truly Bayesian Perspective, S. Greenland, Münster, Germany (Organizer)  
 05/1999 Hierarchical Modeling, J.S. Witte, Münster, Germany (Organizer)  
 09/2002 New Methods in Epidemiology, EPICOH, Barcelona, Spain

**Federal and international committees**

1991- 2006 German Social Accident Insurance Institution Task Force: Health Risks of Uranium Miners  
 Since 1997 German Research Foundation, Commission on Maximum Concentrations at the Workplace (MAK)  
 1998 German Ministry of Labor: Committee on Occupational Diseases: nitrosamines-related occupational cancer. Invited external expert

- 2001-2002 Social Accident Insurance Institution. Scientific Advisory Group for Studies on Secondary Prevention of Asbestos Related Cancers
- 2001-2002 German Network of Competence: Malignant Lymphomas
- 2001-2004 Commission on Prevention, German Cancer Society
- 2001-2008 German National Agency for Radiation Safety, Scientific Advisory Committee: Epidemiologic Study of Childhood Leukemia in the Vicinity of Nuclear Power Plants
- 2002 "Europe Against Cancer Programme": European Code Against Cancer. Invited expert
- 2002 EUROpean Cancer Health Indicators Project (EUROCHIP). Invited expert
- 2003 European Commission, Directorate-General Health & Consumer Protection: Expert Meeting on Tobacco Ingredients
- Since 2004 UN Environment Programme, ILO & WHO: International Chemical Safety Cards (ICSCs)
- 2005 WHO IPCS/IARC Working group on chrysotile substitutes (reports to UN-Rotterdam Convention)
- 2005 International Labour Organization (ILO), Expert on updating of the List of Occupational Diseases
- 2005 Asbestos Interministerial Commission of Brazil: Asbestos and Health. Invited WHO expert.
- 2005 WHO Cancer Control Steering Group
- 2006 WHO Working group on elimination of asbestos-related diseases
- 2006 InVS Expert group, Carcinogenicity of Formaldehyde (reports to French Ministry of Labor)
- Since 2006 UK Health & Safety Executive (HSE): Burden of occupational cancer. Invited external expert
- 2006- 2010 WHO Expert Group on Indoor Air Quality Guidelines
- Since 2006 NIOSH NORA/IARC Working group on gaps in occupational carcinogen identification
- 2007 EU, Directorate-General Health & Consumer Protection, SCENIHR Expert group on smokeless tobacco
- 2007 WHO/TFI-IARC Working group on tobacco product regulation
- 2007 Irish Cancer Society Expert Group on Carcinogenicity of Biofuels
- Since 2007 WHO Global Burden of Foodborne Diseases. Epidemiology Reference Group (FERG)
- Since 2009 WHO Global Burden of Disease: indoor air pollution
- Since 2009 WHO Global Burden of Disease: occupational cancer
- 2010 WHO Expert Consultation on DDT
- 2010 International high-level expert conference on chemical safety and the Rotterdam Convention: Policies and practices in Russia
- 2011 International Panel of Experts on Hexavalent Chromium, Greek Ministry of Environment
- 2011 WHO expert meeting on asbestos
- 2011 Conference of Parties, FCTC, WHO
- 2012 German Committee on Radiation Protection
- Since 2012 WHO network on global collaboration in chemical risk assessment
- Since 2013 Regional Meeting on Implementation of the WHO Framework Convention on Tobacco Control
- 2014 Update of the Helsinki Criteria for Asbestos related diseases. Porvoo, Finland

### **Fellowships**

- 1990-1991 Fellowship, German Academic Exchange Office
- 1992 Fellowship, German Academic Exchange Office
- 1994 Fellowship, German Academic Exchange Office
- 1996 Fellowship, German Academic Exchange Office

### **C. Selected Peer-reviewed Publications (Selected from >150 peer-reviewed publications)**

#### **Most relevant to the current application (in chronological order)**

- Straif K, Loomis D, Guyton K, Grosse Y, Lauby-Secretan, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Mattock H; International Agency for Research on Cancer Monographs Advisory Group (IARC), Lyon, France. Future priorities for the IARC Monographs. *Lancet Oncol.* 2014; 15: 683-684  
[www.thelancet.com/journals/lanonc/article/PIIS1470-2045%2814%2970168-8/fulltext#article\\_upsell](http://www.thelancet.com/journals/lanonc/article/PIIS1470-2045%2814%2970168-8/fulltext#article_upsell)
- Herceg Z, Lambert MP, van Veldhoven K, Demetriou C, Vineis P, Smith M, Straif K, Wild C. Towards incorporating epigenetic mechanisms into carcinogen identification and evaluation. *Carcinogenesis* 2013; 34: 1955-1967, PMID: 23749751, PMCID: PMC3765050
- Murray CJL, Aboyans V, Abraham JP, Ackerman I, Ahn SY, Ali MK, et al. GBD 2010 country results: a global public good. *Lancet* 2013; dx.doi.org/10.1016/S0140-6736(13)60283-4, PMID: 23668561
- Lim SS, Vos T, Flaxman AD, Danaei G, Shibuya K, Adair-Rohani H, et al. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990-

- 2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet* 2012; 380:2224-2260, PMID: 23245609, PMCID: PMC4156511
- Olivier M, Hollstein M, Schmeiser HH, Straif K, Wild CP. Upper urinary tract urothelial cancers: where it is A:T. *Nat Rev Cancer* 2012; 12: 503-504, PMID: 23002458
- Demetriou C, Straif K, Vineis P. From testing to estimation: the problem of false positives in the context of carcinogen evaluation in the IARC Monographs. *Cancer Epidemiol Biom Prev* 2012; 21: 1272-1281, PMID: 22714739
- Cogliano VJ, Baan R, Straif K, Grosse Y, Secretan B, El Ghissassi F, et al. Preventable exposures associated with human cancers. *J Natl Cancer Inst.* 2011; 103: 1827-1839, PMID: 22158127, PMCID: PMC3243677
- Ward E, Schulte PA, Straif K, Hopf NB, Caldwell JC, Carreón T, et al. Research recommendations for selected IARC-classified agents. *Env Health Perspect* 2010; 118: 1355-62, PMID: 20562050, PMCID: PMC2957912

#### Additional recent publications of importance to the field (in chronological order)

(b)(4), (b)(6)

- Guha N, Warnakulasuriya S, Vlaanderen J, Straif K. Betel quid chewing and the risk of oral and oropharyngeal cancers: a meta-analysis with implications for cancer control. *Int J Cancer* 2014; 135: 1433-43, PMID: 24302487
- Vlaanderen J, Straif K, Martinsen JI, Kauppinen T, Pukkala E, Sparén P, et al. K. Cholangiocarcinoma among workers in the printing industry; using the NOCCA database to elucidate the generalizability of a cluster report from Japan. *Occup Environ Med* 2013; 70: 828-30, PMID: 24142991
- Chang JS, Straif K, Guha N. The role of alcohol dehydrogenase genes in head and neck cancers: a systematic review and meta-analysis of ADH1B and ADH1C. *Mutagenesis* 2012; 27: 275-86, PMID: 22042713
- Olsson AC, Gustavsson P, Kromhout H, Peters S, Vermeulen R, Brüske I, Pesch B, Siemiatycki J, Pintos J, Brüning T, Cassidy A, Wichmann HE, Consonni D, Landi MT, Caporaso N, Plato N, Merletti F, Mirabelli D, Richiardi L, Jöckel KH, Ahrens W, Pohlabeln H, Lissowska J, Szeszenia-Dabrowska N, Zaridze D, Stücker I, Benhamou S, Bencko V, Foretova L, Janout V, Rudnai P, Fabianova E, Stanescu Dumitru R, Gross IM, Kendzia B, Forastiere F, Bueno-de-Mesquita B, Brennan P, Boffetta P, Straif K. Exposure to diesel motor exhaust and lung cancer risk in a pooled analysis from case-control studies in Europe and Canada. *Am J Respir Crit Care Med* 2011; 183: 941-8, PMID: 21037020
- Leon ME, Beane-Freeman LE, Douwes J, Hoppin JA, Kromhout H, Lebaillly P, Nordby KC, Schenker M, Schüz J, Waring SC, Alavanja MC, Annesi-Maesano I, Baldi I, Dalvie MA, Ferro G, Fervers B, Langseth H, London L, Lynch CF, McLaughlin J, Merchant JA, Pahwa P, Sigsgaard T, Stayner L, Wesseling C, Yoo KY, Zahm SH, Straif K, Blair A. AGRICOH: a consortium of agricultural cohorts. *Int. J. Environ. Res. Public Health* 2011; 8: 1341-57, PMID: 21655123, PMC3108113
- Stevens RG, Hansen J, Costa G, Haus E, Kauppinen T, Aronson KJ, Castaño-Vinyals G, Davis S, Frings-Dresen MH, Fritschi L, Kogevinas M, Kogi K, Lie JA, Lowden A, Peplonska B, Pesch B, Pukkala E, Schernhammer E, Travis RC, Vermeulen R, Zheng T, Coglianò V, Straif K. Considerations of circadian impact for defining 'shift work' in cancer studies: IARC Working Group Report. *Occup Environ Med* 2011; 68: 154-62, PMID: 20962033

#### D. Research Support

##### CURRENT

**U01CA033193 (NCI) Straif, K (PI) 09/01/10-08/31/15**

Evaluation of Carcinogenic Risks to Humans - Y28 - Y33

This project supports the IARC Monographs Program that started in 1971 and has been co-financed by the NCI since 1982. The IARC Monographs Program convenes meetings of advisory groups (composed of senior officials and scientists from health agencies and cancer research institutions) to prioritize suspected cancer agents that are suggested by individuals and organizations worldwide. Agents are prioritized by the extent of human exposure, suspicion of carcinogenicity, public health relevance and public concern.

**Project Role: PI, IARC**

**Direct funding (NIEHS) Straif, K (PI) 09/01/14-08/31/15**

Evaluation of Carcinogenic Risks to Humans

The NIEHS co-finances the IARC Monograph Programme on an annual basis.

**Project Role: PI, IARC**

(b)(4), (b)(6) Straif, K (PI) 01/01/14-12/31/15

The IARC Handbooks of Cancer Prevention: Breast Cancer Screening

In 1995, the IARC Handbooks of Cancer Prevention were launched to complement the IARC Monographs by providing evaluations of approaches to cancer prevention. This funding partly covers the latest Prevention Handbook on breast cancer screening.

**Project Role: PI, IARC**

(b)(4), (b)(6) Loomis, D (PI) 01/01/14-12/31/14

The IARC Monographs Programme 2014

The funding from the (b)(4), (b)(6) co-finances the IARC Monograph Programme on an annual basis.

**Project Role: Co-investigator, IARC**

COMPLETED

U01CA033193 (NCI) Straif, K (PI) 09/01/13-08/31/14

Evaluation of Carcinogenic Risks to Humans - Y32 - supplemental award

This administrative supplement to the Monograph Programme is intended to co-finance the establishment of a fully searchable online database of the IARC Monographs with graphical user interface, and particularly linking it with the US NCI grants database.

**Project Role: PI, IARC**

(b)(4), (b)(6) Fensel, D (PI) 04/01/08-09/30/11

The Large Knowledge Collider (LarKC)

This project intended to develop a platform for large scale integrated reasoning and Web search.

**Project Role: Co-investigator, IARC**

Direct funding (NIEHS) Straif, K (PI) 09/01/13-08/31/14

Evaluation of Carcinogenic Risks to Humans

The NIEHS co-finances the IARC Monograph Programme on an annual basis.

**Project Role: PI, IARC**

Direct funding (NIEHS) Straif, K (PI) 09/01/12-08/31/13

Evaluation of Carcinogenic Risks to Humans

The NIEHS co-finances the IARC Monograph Programme on an annual basis.

**Project Role: PI, IARC**

Direct funding (NIEHS) Straif, K (PI) 09/01/11-08/31/12

Evaluation of Carcinogenic Risks to Humans

The NIEHS co-finances the IARC Monograph Programme on an annual basis.

**Project Role: PI, IARC**

(b)(4), (b)(6) Straif, K (PI) 08/27/09-03/27/12

Occupational and environmental risk factors of lung cancer 2009-11

The main objective of this project was to assess the risk of lung cancer from combined exposure to occupational and environmental agents, using advanced bio-statistical modeling.

**Project Role: PI, IARC**

(b)(4), (b)(6) Straif, K (PI) 01/01/07-12/31/11

Pooled analysis of Case-Control Studies on the Interaction of Occupational Carcinogens in the Development of Lung Cancer (SYNERGY)

This project intended to study effect modification in a pooled analysis of occupational risk factors for lung cancer.

**Project Role: PI, IARC**

(b)(4), (b)(6) Straif, K (PI) 01/01/07-12/31/11

(b)(4), (b)(6) Exposure Assessment for Shift-work 2009.

This project intended to develop recommendations for exposure assessment in studies on shift-work and cancer, following requests from the Scientific Community after the IARC Monographs evaluation of shiftwork.

**Project Role: PI, IARC**

**BIOGRAPHICAL SKETCH**

Provide the following information for the Senior/key personnel and other significant contributors.  
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME Dana Loomis		POSITION TITLE Deputy Section Head, IARC Monographs Section International Agency for Research on Cancer Lyon, France	
eRA COMMONS USER NAME (credential, e.g., agency login) (b)(4), (b)			
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	MM/YY	FIELD OF STUDY
Oberlin College Oberlin OH, USA	BA	1978	Geology
University of North Carolina, Chapel Hill, USA	MSPH	1986	Environmental Sciences
University of North Carolina, Chapel Hill, USA	PhD	1989	Epidemiology

**A. Personal statement**

I am a senior investigator with interests in occupational and environmental epidemiology and exposure assessment. My research examines the role of environmental and occupational exposures in carcinogenesis. Recent and ongoing projects have investigated asbestos fiber size and shape in relation to cancer risk and development of methods for occupational cancer studies. Other previous work includes research on cancer risks from occupational exposure to polychlorinated biphenyls and electromagnetic fields and ethnic disparities in occupational cancer risks. My publications have been cited over 3000 times (h-Index 35). In addition, I have extensive experience in directing large, complex projects, in research evaluation and in institutional administration. I currently serve as Deputy Head of the Section of IARC Monographs and Responsible Officer for selected Monograph evaluations.

**B. Positions and Honors**Employment

1989-96 Assistant Professor, Department of Epidemiology, University of North Carolina, Chapel Hill, NC  
 1996-2001 Associate Professor, Department of Epidemiology, University of North Carolina, Chapel Hill, NC  
 1997 Fulbright Scholar, Instituto Nacional de Salud Pública de México, Cuernavaca, Mexico  
 2001-2006 Professor, Department of Epidemiology, University of North Carolina, Chapel Hill, NC  
 2002-2006 Professor, Department of Environmental Sciences & Engineering, University of North Carolina  
 2006 Interim Chair, Department of Epidemiology, University of North Carolina, Chapel Hill, NC  
 2007-2010 Professor of Environmental & Occupational Health, University of Nevada, Reno NV  
 2008-2010 Director, School of Public Health, University of Nevada, Reno NV  
 2010-2012 Professor and Chair, Dept of Epidemiology, University of Nebraska Medical Center, Omaha NE  
 2010-2012 Associate Director, Eppley Cancer Center, University of Nebraska Medical Center, Omaha NE  
 2012- Deputy Head, Section of IARC Monographs, International Agency for Research on Cancer, Lyon, France

Editorial, Professional Societies and Advisory Boards (selected)

1998-2003 Member & Chair, Safety & Occupational Health Study Section, Center for Scientific Review, DHHS  
 2006- Chair, Scientific Committee on Epidemiology, International Commission on Occupational Health  
 2004-2013 Editor, *Occupational & Environmental Medicine*  
 2010-2012 Member, National Toxicology Program, Board of Scientific Counselors

**C. Selected peer-reviewed publications** (from over 160 peer-reviewed publications)Most relevant to the current application

Loomis D, Grosse Y, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Baan R, Mattock H, Straif K. The carcinogenicity of outdoor air pollution. *Lancet Oncol*. 2013;14 (13):1262-3. PMID: 25035875

Loomis D, Huang W, Chen G. The International Agency for Research on Cancer (IARC) evaluation of the carcinogenicity of outdoor air pollution: focus on China. *Chin J Cancer*. 2014;33:189-96. doi: 10.5732/cjc.014.10028. PMID: 24694836.

Hamra GB, Guha N, Cohen AJ, Laden F, Raaschou-Neilsen O, Samet J, Vineis P, Forastiere F, Saldiva PHN, Yorifuji T, Loomis D. Outdoor particulate matter exposure and lung cancer risk: a systematic review and meta-analysis. *Environmental Health Perspectives* 2014;122:906-11. PMID: 24911630.

Vlaanderen J, Straif K, Ruder A, Blair A, Hansen J, Lynge E, Charbotel B, Loomis D, Kauppinen T, Kyyronen P, Pukkala E, Weiderpass E, Guha N. Tetrachloroethylene Exposure and Bladder Cancer Risk: A Meta-Analysis of Dry-Cleaning-Worker Studies. *Environ Health Perspect*. 2014;122:661-6. PMID: 24659585

Straif K, Loomis D, Guyton K, Grosse Y, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Mattock H; International Agency for Research on Cancer Monographs Advisory Group (IARC), Lyon, France. Future priorities for the IARC Monographs. *Lancet Oncology* 2014;15(7):683-684.

[www.thelancet.com/journals/lanonc/article/PIIS1470-2045%2814%2970168-8/fulltext#article\\_upsell](http://www.thelancet.com/journals/lanonc/article/PIIS1470-2045%2814%2970168-8/fulltext#article_upsell)

#### Other related publications

Loomis DP, Savitz DA, Ananth CV. Breast cancer mortality among female electrical workers in the United States. *J Natl Cancer Inst* 1994;86:921-925. PMID: 8196082

Savitz DA, Loomis DP. Magnetic field exposure in relation to leukemia and brain cancer mortality among electric utility workers. *Am J Epidemiol* 1995;141:123-134. PMID: 77817968

Loomis DP, Wolf SH. Mortality of workers at the Y-12 nuclear materials plant, 1947-1990. *Am J Ind Med* 1996;29:131-141. PMID: 8821356

Loomis DP, Browning SH, Schenck AP, Gregory E, Savitz DA. Cancer mortality among electric utility workers exposed to polychlorinated biphenyls. *Occ Environ Med* 1997;54:720-728. PMID: 9404319, PMCID: 1128926

Loomis D, Schulz M. Mortality from six work-related cancers among African-Americans and Latinos. *Am J Ind Med* 2000;38:565-575. PMID: 11025498

Richardson DB, Loomis D. The impact of exposure categorization for grouped analyses of cohort data. *Occup Environ Med* 2004;61:930-935. PMID: 15477287

Loomis D, Richardson DB, Elliott L. Poisson regression analysis of ungrouped data. *Occup Environ Med* 2005;62:325-329. PMID: 15837854.

Loomis D, Dement JM, Wolf SH, Richardson DB. Lung cancer mortality and fiber exposure among North Carolina asbestos textile workers. *Occup Environ Med* 2009;66:535-42. PMID: 19282317

Loomis D, Dement JM, Richardson DB, Wolf S. Asbestos fiber dimensions and lung cancer mortality among workers exposed to chrysotile. *Occ Environ Med* 2010;67:580-4. PMID 19897464. PMID: 19897464, PMCID: PMC2975987.

Kim HM, Richardson D, Loomis D, van Tongeren M, Burstyn I. Bias in the estimation of exposure effects with individual- and group-based exposure assessment. *J Expo Scie Environ Epidemiol* 2011;21:212-21. PMID 20179749.

Elliott L, Loomis D, Dement J, Hein MJ, Richardson D, Stayner L. Lung cancer mortality in North Carolina and South Carolina asbestos textile workers. *Occup Environ Med* 2012;69:385-90. PMID: 22267448

Loomis D, Dement JM, Elliott L, Richardson DB, Kuempel E, Stayner LT. Increased lung cancer mortality among chrysotile asbestos textile workers is more strongly associated with exposure to long, thin fibers. *Occup Environ Med* 2012;69:564-568. PMID: 22581965

Hamra GB, Loomis D, Dement J. Examining the association of lung cancer and highly-correlated fibre size-specific asbestos exposures with a hierarchical Bayesian model. *Occup Environ Med.* 2014 May;71(5):353-7. doi: 10.1136/oemed-2013-101965. PMID: 24569623.

#### D. Research Support

##### *CURRENT*

(b)(4), (b)(6) Loomis, D (PI) 01/01/14-12/31/14

The IARC Monographs Programme 2014

The funding from the (b)(4), (b)(6) co-finances the IARC Monograph Programme on an annual basis.

**Project Role: PI, IARC**

##### *COMPLETED*

**R01 ES015326-01A1 (NIEHS) Styblo, M (PI) 08/07/08-05/31/13**

Environmental Arsenic and Diabetes Mellitus

This is a translational research project that examines the association between environmental exposures to arsenic and diabetes mellitus, focusing on arsenic metabolism as a key determinant of the outcome of exposure. Cell culture, animal and human population studies are included in this project.

**R01 CA117841 (NCI) Loomis, D (PI) 01/07-12/12**

Cohort analysis methods for occupational cancer studies

Subcontract to the University of North Carolina, D. Richardson, PI

Agency: NCI Period:

This competing renewal of a current R01 project continues development of analytical methods for occupational cohort studies.

**Project Role: PI, UNR**

**U54 OH 010162 (NIOSH) Loomis, D (Co-PI) 10/01/11-09/29/16**

**Central States Center for Agricultural Safety and Health**

This grant establishes the Central States Center for Agricultural Safety and Health, a multi-disciplinary research center focusing primarily on respiratory disease research, injury prevention, and educational needs of farmers and ranchers.

**Project Role: Deputy Director** (Note: responsibility for this project passed to others upon my departure from the University of Nebraska).

**BIOGRAPHICAL SKETCH**

Provide the following information for the Senior/key personnel and other significant contributors.  
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME Guyton, Kathryn Z		POSITION TITLE Scientist	
eRA COMMONS USER NAME (credential, e.g., agency login) (b)(4),		Monographs Program, International Agency for Research on Cancer, World Health Organization	
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)			
INSTITUTION AND LOCATION (if applicable)	DEGREE (if applicable)	MM/YY	FIELD OF STUDY
Johns Hopkins University, Baltimore, MD, USA	BA (cum laude)	06/87	Biology with minor in French
Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA	PhD	06/93	Environmental Health Sciences

**A. Personal Statement**

My qualifications to contribute meaningfully to the proposed work comprise expert technical abilities coupled with exceptional leadership, teamwork and communication skills. My technical strengths include currency with mechanistic toxicology and carcinogenesis, centered in the scientific assessment and classification of carcinogenic substances. For the IARC Monographs Programme, I am advancing methods to systematically apply mechanistic and high-throughput/high-content data streams to carcinogen classification. Prior work at the US Environmental Protection Agency was also centered on carcinogenesis mechanisms in human health risk assessments. In particular, I served as a leader or key contributor to assessments of prevalent environmental contaminants (including tetrachloroethylene, trichloroethylene, trichloroacetic acid and dioxin). Other previous work involved providing expertise in molecular toxicology and carcinogenesis to the US National Cancer Institute for projects in the screening, prevention, treatment and imaging of cancer in at-risk populations. With this experience as background, I am well-qualified to provide input to this project. Indeed, I have a strong record of successfully completing quality written work products, including highly cited and influential scientific publications (with numerous articles cited >100 times and an overall *h*-index of 27). In summary, I have a demonstrated record of contributing to and completing high-impact projects in the area of mechanistic data interpretation and carcinogen classification that will benefit this research project.

**B. Positions and Honors****Positions and Employment**

1993-1997 Research Fellow, National Institute on Aging, National Institutes of Health, Baltimore, MD, USA  
 1997-1999 Scientist, CCS Associates (<http://www.ccsainc.com>), Vienna, VA, USA  
 1999-2000 Senior Scientist, CCS Associates, Vienna, VA, USA  
 2000-2005 Director, Scientific Affairs, CCS Associates, Vienna, VA, USA  
 2005-2013 Toxicologist, National Center for Environmental Assessment, Office of Research and Development, US Environmental Protection Agency (US EPA), Washington DC, USA  
 5-12/2012 Acting Deputy National Program Director, Human Health Risk Assessment Research Program, Office of Research and Development, US EPA, Washington DC, USA  
 2014- Scientist, Section of IARC Monographs, International Agency for Research on Cancer, Lyon, France

**Other Experience and Professional Memberships (selected)**

1997- Member, Society of Toxicology

- 1998- Diplomat, American Board of Toxicology  
 2002 Board of Scientific Advisors, Bionexus Ventures  
 2006- Editorial Board Member, *Mutation Research*  
 2012-2013 Risk Assessment Forum, US Environmental Protection Agency

### **Honors**

- 2012 Gold Medal for Exceptional Service, US EPA  
 2010 Scientific and Technological Achievement Award, Level III, US EPA  
 2008 SOT Award, Best Presentation in Risk Assessment  
 2008–2011 Outstanding Performance Rating, US EPA  
 2007–2012 Superior Performance Awards, US EPA  
 1993 Cornelius W. Krusé Award for outstanding dissertation in Environmental Health Sciences  
 1991–1992 Meritorious Research Awards from SOT Specialty Sections (Mechanisms, 1991, Carcinogenesis, 1992)  
 1991 SOT Predoctoral Fellowship, Hoffmann-LaRoche  
 1991 SOT Student Travel Award  
 1987–1992 National Research Service Award, Training Grant, sponsored by the National Institute of Environmental Health Sciences

### **C. Peer-reviewed Publications Relevant to the Proposal** (Selected from 60 peer-reviewed publications)

#### **Most Relevant to the Current Application**

- Grosse Y, Loomis D, **Guyton K**, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Scoccianti C, Mattock H, Straif K, International Agency for Research on Cancer Monograph Working Group. Carcinogenicity of fluoro-edenite, silicon carbide fibres and whiskers, and carbon nanotubes. *Lancet Oncol*, 2014, Epub ahead of print Oct. 31, 2014 [http://dx.doi.org/10.1016/S1470-2045\(14\)71109-X](http://dx.doi.org/10.1016/S1470-2045(14)71109-X)
- Straif K, Loomis D, **Guyton K**, Grosse Y, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Mattock H. Future priorities for the IARC Monographs. *Lancet Oncol*. 2014 15(7): 683-4. [http://www.thelancet.com/journals/lanonc/article/PIIS1470-2045%2814%2970168-8/fulltext#article\\_upsell](http://www.thelancet.com/journals/lanonc/article/PIIS1470-2045%2814%2970168-8/fulltext#article_upsell)
- Benbrahim-Tallaa L, Lauby-Secretan B, Loomis D, **Guyton KZ**, Grosse Y, El Ghissassi F, Bouvard V, Guha N, Mattock H, Straif K. Carcinogenicity of perfluorooctanoic acid, tetrafluoroethylene, dichloromethane, 1,2-dichloropropane, and 1,3-propane sultone. *Lancet Oncol*. 2014 15(9):924-5, PMID: 25225686
- Thomas R, Hubbard AE, McHale CM, Zhang L, Rappaport SM, Lan Q, Rothman N, Vermeulen R, **Guyton KZ**, Jinot J, Sonawane BR, Smith MT. Characterization of changes in gene expression and biochemical pathways at low levels of benzene exposure. *PLoS One*. 2014 9(5):e91828. PMID: 24786086, PMCID: PMC4006721
- Guyton KZ**, Hogan KA, Scott CS, Cooper GS, Bale AS, Kopylev L, Barone Jr. S, Makris SL, Glenn B, Subramaniam R, Gwinn MR, Dzubow RC, Chiu WA. Human health effects of tetrachloroethylene: Key findings and scientific issues. 2014. *Environ Health Perspect*. 122(4): 325-334. PMID: 24531164, PMCID: PMC3984230
- Rusyn I, Chiu WA, Lash LH, Kromhout H, Hansen J, **Guyton KZ**. Trichloroethylene: mechanistic, epidemiologic, and other supporting evidence of carcinogenic hazard. 2014. *Pharmacology and Therapeutics*. 141(1): 55-68. PMID: 23973663, PMCID: PMC3867557
- Kushman ME, Kraft AD, **Guyton KZ**, Chiu WA, Makris SL, Rusyn I. A systematic approach for identifying and presenting mechanistic evidence in human health assessments. 2013. *Reg Tox Pharm*, 67(2):266-277. PMID: 23959061, PMCID: PMC3818152

Zeise L, Bois FY, Chiu WA, Hattis D, Rusyn I, **Guyton KZ**. 2012. Addressing human variability in next-generation human health risk assessments of environmental chemicals. *Environ Health Perspect*. 121(1):23-31. PMID: 23086705, PMCID: PMC3553440

Rusyn I, Sedykh A, Low Y, **Guyton KZ**, Tropsha A. 2012. Predictive modeling of chemical hazard by integrating numerical descriptors of chemical structures and short-term toxicity assay data. *Toxicological Sciences*, 127(1):1-9. PMID: 22387746, PMCID: PMC3327873

**Guyton KZ**, Kyle AD, Aubrecht J, Cogliano VJ, Eastmond DA, Jackson M, Keshava N, Sandy MS, Sonawane B, Zhang L, Waters MD, Smith MT. 2009. Improving prediction of chemical carcinogenicity by considering multiple mechanisms and applying toxicogenomic approaches. *Mutation Research* 681(2-3): 230-240. PMID: 19010444

**Guyton KZ**, Kensler TW. 1993. Oxidative mechanisms in carcinogenesis. *British Medical Bulletin* 49(3): 523-544, PMID: 8221020

### **Primary Research Articles—Mechanisms**

Fawcett TW, Martindale JL, **Guyton KZ**, Hai T, Holbrook NJ. 1999. Complexes containing activating transcription factor (ATF)/cAMP-responsive-element-binding protein (CREB) interact with the CCAAT/enhancer-binding protein (C/EBP)-ATF composite site to regulate Gadd153 expression during the stress response. *The Biochemical Journal* 339 ( Pt 1): 135-141. PMID: 10085237, PMCID: PMC1220137

**Guyton KZ**, Xu Q, Holbrook NJ. 1996. Induction of the mammalian stress response gene GADD153 by oxidative stress: role of AP-1 element. *The Biochemical Journal* 314 ( Pt 2): 547-554. PMID: 8670069, PMCID: PMC1217084

**Guyton KZ**, Liu Y, Gorospe M, Xu Q, Holbrook NJ. 1996. Activation of mitogen-activated protein kinase by H<sub>2</sub>O<sub>2</sub>. Role in cell survival following oxidant injury. *The Journal of Biological Chemistry* 271(8): 4138-4142. PMID: 8626753

Liu Y, **Guyton KZ**, Gorospe M, Xu Q, Lee JC, Holbrook NJ. 1996. Differential activation of ERK, JNK/SAPK and P38/CSBP/RK map kinase family members during the cellular response to arsenite. *Free Radical Biology & Medicine* 21(6): 771-781. PMID: 8902523

**BIOGRAPHICAL SKETCH**

Provide the following information for the Senior/key personnel and other significant contributors.  
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME GROSSE, Yann		POSITION TITLE Scientist, Section of the IARC Monographs	
eRA COMMONS USER NAME (credential, e.g., agency login)			
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	MM/YY	FIELD OF STUDY
LEGTP Jean Rostand, Strasbourg, France	B.T.S.	1987	Biochemistry
Faculty of Sciences, University of Metz, France	B.S.	1989	Chemistry & Biochemistry
Faculty of Sciences, University of Strasbourg, France	M.S.	1992	Environ. toxicology
Institut National Polytechnique of Toulouse, France	Ph.D.	1996	Genetic toxicology

**A. Personal Statement**

I have worked for the *IARC Monographs* since 1999. Since 2001, I organize *IARC Monographs* meetings as Responsible Officer (11 to date), and I am the senior rapporteur and reviewer of the section on "Studies of Cancer in Experimental Animals" for each *IARC Monographs* meeting.

**B. Positions and Honors****Employment**

- 1997-1998 Postdoc., Unit of Gene-Environment Interactions, International Agency for Research on Cancer, WHO, Lyon, France.
- 1999-pres. Scientist, section of the *IARC Monographs*, International Agency for Research on Cancer, WHO, Lyon, France.

**Committees**

- 2006 Invitation to serve on the French Agency for Environmental and Occupational Health Safety (AFSSET) Board of Scientific Counselors on Formaldehyde

**Fellowships**

- 1992-1995 PhD Scholarship, Ministry of Research and Technology/University of Strasbourg, France
- 1995-1996 Graduate Teaching Assistant Fellowship, Department of Microbiology, Institut National Polytechnique of Toulouse, France

**C. Selected peer-reviewed publications****Most relevant to the current application**

- Grosse Y, Baan R, Straif K, Secretan B, El Ghissassi F, Bouvard V, Altieri A, Coglianò V, on behalf of the WHO International Agency for Research on Cancer Monograph Working Group (2007) Carcinogenicity of 1,3-butadiene, ethylene oxide, vinyl chloride, vinyl fluoride, and vinyl bromide. *Lancet Oncol.* 8(8), 679-680, PMID:17726789
- Grosse Y, Baan R, Straif K, Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Galichet L, Coglianò V; WHO International Agency for Research on Cancer Monograph Working Group (2009) A review of human carcinogens-Part A: pharmaceuticals. *Lancet Oncol.* 10(1), 13-14, PMID:19115512

- Grosse Y, Baan R, Secretan-Lauby B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Islami F, Galichet L, Straif K; WHO International Agency for Research on Cancer Monograph Working Group (2011) Carcinogenicity of chemicals in industrial and consumer products, food contaminants and flavourings, and water chlorination byproducts. *Lancet Oncol.*, 12(4), 328-329, PMID:21598447
- Grosse Y, Loomis D, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Baan R, Mattock H, Straif K; International Agency for Research on Cancer Monograph Working Group (2013) Carcinogenicity of some drugs and herbal products. *Lancet Oncol.* 14(9), 807-808, PMID:24058961
- Grosse Y, Loomis D, Guyton KZ, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Scoccianti C, Mattock H, Straif K; International Agency for Research on Cancer Monograph Working Group (2014) Carcinogenicity of fluoro-edenite, silicon carbide fibres and whiskers, and carbon nanotubes. *Lancet Oncol.* 2014; 15: 1427-1428, PMID: not yet indexed

### **Additional recent publications of importance to the field**

- Grosse Y, Baan R, Straif K, Secretan B, El Ghissassi F, Cogliano V on behalf of the WHO International Agency for Research on Cancer Monographs Working Group (2006) Carcinogenicity of nitrate, nitrite, and cyanobacterial toxins. *Lancet Oncol.*, 7(8), 628-629, PMID:16900606
- Cogliano VJ, Baan RA, Straif K, Grosse Y, Secretan B, El Ghissassi F (2008) Use of mechanistic data in IARC evaluations. *Environ. Mol. Mutagen.*, 49(2), 100-109, PMID:19240161
- Baan R, Grosse Y, Straif K, Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Freeman C, Galichet L, Cogliano V; WHO International Agency for Research on Cancer Monograph Working Group (2009) A review of human carcinogens-Part F: chemical agents and related occupations. *Lancet Oncol.*, 10(12), 1143-1144, PMID:19998521
- Baan R, Grosse Y, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Islami F, Galichet L, Straif K; WHO International Agency for Research on Cancer Monograph Working Group (2011) Carcinogenicity of radiofrequency electromagnetic fields. *Lancet Oncol.*, 12(7), 624-626, PMID:21845765
- Cogliano VJ, Baan R, Straif K, Grosse Y, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Freeman C, Galichet L, Wild CP (2011) Preventable exposures associated with human cancers. *J. Natl Cancer Inst.*, 103(24), 1827-1839, PMID:22158127
- Lauby-Secretan B, Baan R, Grosse Y, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Galichet L, Straif K; WHO International Agency for Research on Cancer Monograph Working Group (2011) Bitumens and bitumen emissions, and some heterocyclic polycyclic aromatic hydrocarbons. *Lancet Oncol.*, 12(13), 1190-1191, PMID:22232803
- Bouvard V, Baan RA, Grosse Y, Lauby-Secretan B, El Ghissassi F, Benbrahim-Tallaa L, Guha N, Straif K; WHO International Agency for Research on Cancer Monograph Working Group (2012) Carcinogenicity of malaria and of some polyomaviruses. *Lancet Oncol.*, 13(4), 339-340, PMID:22577663
- Benbrahim-Tallaa L, Baan RA, Grosse Y, Lauby-Secretan B, El Ghissassi F, Bouvard V, Guha N, Loomis D, Straif K; International Agency for Research on Cancer Monograph Working Group (2012) Carcinogenicity of diesel-engine and gasoline-engine exhausts and some nitroarenes. *Lancet Oncol.*, 13(7), 663-664, PMID:22946126
- Guha N, Loomis D, Grosse Y, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Baan R, Mattock H, Straif K; International Agency for Research on Cancer Monograph Working Group (2012) Carcinogenicity of trichloroethylene, tetrachloroethylene, some other chlorinated solvents, and their metabolites. *Lancet Oncol.*, 13(12):1192-1193, PMID:23323277
- Lauby-Secretan B, Loomis D, Grosse Y, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Baan R, Mattock H, Straif K; International Agency for Research on Cancer Monograph Working Group (2013) Carcinogenicity of polychlorinated biphenyls and polybrominated biphenyls. *Lancet Oncol.*, 14(4), 287-288, PMID:23499544
- Loomis D, Grosse Y, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Baan R, Mattock H, Straif K; International Agency for Research on Cancer Monograph Working Group (2013) The carcinogenicity of outdoor air pollution. *Lancet Oncol.*, 15(9), 924-925, PMID:25035875

**BIOGRAPHICAL SKETCH**

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NAME LAUBY-SECRETAN, Marie Béatrice		POSITION TITLE Scientist, IARC Monographs Section	
eRA COMMONS USER NAME (credential, e.g., agency login)			
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	MM/YY	FIELD OF STUDY
University of Geneva, Switzerland	Licence (BSc)	1985-1989	Biochemistry
University of Geneva, Switzerland	Diplôme (MSc)	1989-1991	Biochemistry
St. Bartholomew and the Royal London School of Medicine and Dentistry, London, UK	PhD	1992-1996	Toxicology

**A. Personal Statement**

I have been working as scientist in the Section of the IARC Monographs since 2002. In that function, I have been Responsible Officer for 4 Monographs, and Scientific Coordinator and editor for the IARC Working Group Report No. 1. I have acted as rapporteur and scientific editor in all Monograph meetings and several IARC Handbooks of Cancer Prevention meetings. Most recently I have been responsible for relaunching the IARC Handbooks of Cancer Prevention series, and Responsible Officer for the meeting for Handbook vol. 15.

**B. Positions and Honors****Employment**

1990–1991: Master's trainee, ISREC, Dept. of Chemical Carcinogenesis, Epalinges s/ Lausanne, Switzerland  
 1991–1992: Research assistant, *GlaxoWellcome*, Biomedical Research Institute, Geneva, Switzerland  
 1996–1997: Research Assistant, Dept. of Toxicology, St. Bartholomew & the Royal London School of Medicine and Dentistry, London, UK  
 1998–2001: Post-doctoral fellow, Dept. of Cancer Cell Biology, Harvard School of Public Health, Boston, MA; Dept. of Environmental Health, UCLA School of Medicine and Public Health, Los Angeles, CA (transfer of the research group from Boston to Los Angeles)  
 2001–2002: Post-doctoral fellow, Unit of Gene-Environment Interactions, IARC/WHO, Lyon, France  
 2002–present: Scientist, Section of the IARC Monographs programme, IARC/WHO, Lyon, France

**Fellowships**

Jan. 1999 – Dec. 1999: Post-doctoral fellowship awarded by the Swiss Cancer League  
 Jan. 1998 – Dec. 1998: Post-doctoral fellowship awarded by the Swiss National Fund  
 Oct. 1992 - April 1996: PhD studentship awarded by *GlaxoWellcome*, R & D, Ware, UK  
 March 1994 and 1996: Student bursary awarded by the British Toxicology Society for the participation at international scientific meetings

**Other Experience and Professional Memberships**

2007-2013 Vice-president to a specialized expert committee on chemical substances at the French National Agency for Health and Safety (ANSES)  
 2006-2011 Taught Master classes in cancer epidemiology at the Grenoble University  
 2013-2015 President to the Selection Committee of General Support staff member at IARC

**C. Selected peer-reviewed publications**

- Lauby-Secretan B**, Straif K (2014) Human carcinogens identified through the IARC Monographs program. In: The Cancer Atlas, 2<sup>nd</sup> edition. Eds: Jemal A, Vineis P, Bray F, Torre L, Forman D. Atlanta, USA: The American Cancer Society.
- Scoccianti C, **Lauby-Secretan B**, Bello PY, Chajes V, Romieu I (2014) Female breast cancer and alcohol consumption: a review of the literature. *Am J Prev Med.* 46 (3 Suppl 1):S16-25. doi: 10.1016/j.amepre.2013.10.031. PMID: 24512927
- Lauby-Secretan MB**, Loomis D, Grosse Y, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Baan R, Mattock H, Straif K (2013) Carcinogenicity of polychlorinated biphenyls and polybrominated biphenyls. *Lancet Oncol*, **14**, 287-8, PMID: 23499544
- Cogliano VJ, Baan R, Straif K, Grosse Y, **Lauby-Secretan B**, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Freeman C, Galichet L, Wild CP (2011) Preventable exposures associated with human cancers. *J Natl. Cancer Inst.* 103: 1827-1839, PMID: 22158127, PMCID: PMC3243577
- Lauby-Secretan B**, Baan R, Grosse Y, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Galichet L, Straif K (2011) Bitumens and bitumen emissions, and some heterocyclic polycyclic aromatic hydrocarbons. *Lancet Oncol* 12: 1190-1191, PMID: 22232803
- Secretan B**, Straif K, Baan R, Grosse Y, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Galichet L, Coglianov V, on behalf of the WHO International Agency for Research on Cancer Monograph Working Group (2009) A review of human carcinogens--Part E: tobacco, areca nut, alcohol, coal smoke, and salted fish. *Lancet Oncol* 10: 1033-1034, PMID: 19891056
- Cogliano VJ, Baan RA, Straif K, Grosse Y, **Secretan B**, El Ghissassi F (2008) Use of mechanistic data in IARC evaluations. *Environ. Mol. Mutagen.*, **49**, 100-109, PMID:18240161
- The International Agency for Research on Cancer Working Group on artificial ultraviolet (UV) light and skin cancer cancer (**Secretan B**) (2007) The association of use of sunbeds with cutaneous malignant melanoma and other skin cancers: A systematic review. *Int J Cancer*, 120(1): 1116-1122. Erratum in *Int J Cancer*, 120, 2526; PMID: 17131335
- IARC (2006) Preamble to the IARC monographs on the evaluation of carcinogenic risks to humans. <http://monographs.iarc.fr/ENG/Preamble/CurrentPreamble.pdf>
- Cogliano VJ, Baan RA, Straif K, Grosse Y, **Secretan MB**, El Ghissassi F, Kleihues P (2004) The science and practice of carcinogen identification and evaluation. *Environ. Health Perspect.*, **112**, 1269-1274, PMID: 15345338, PMCID: PMC1247515
- Sasco A, **Secretan, MB**, Straif K (2004). Tobacco smoke and cancer: a brief review of recent epidemiological evidence. *Lung Cancer*, **45**, Suppl2: S3-S9, PMID: 15552776
- Secretan MB**, Scuric Z, Oshima J, Bishop AJR, Howlett NG, Yau D, Schiestl RH (2004) Effect of Ku86 and DNA-PKcs deficiency on Non-homologous End-Joining and Homologous Recombination using a transient transfection assay. *Mutat. Res.*, **554**, 351-364, PMID: 15450431
- Rugo RE, **Secretan MB**, Schiestl RH (2002) X-radiation causes a persistent induction of reactive oxygen species and a delayed reinduction of TP53 in normal human diploid fibroblasts. *Radiation Res*, **158**, 210-219, PMID: 12105992
- Aubrecht J, **Secretan MB**, Bishop AJR, Schiestl RH (1999) Involvement of p53 in X-ray induced intrachromosomal recombination in mice. *Carcinogenesis*, **20**, 2229-2236, PMID: 10590213

## D. Research Support

### COMPLETED

(b)(4), (b)(6) **Lauby-Secretan, B (PI)** 01/01/13-12/31/13

The IARC Monographs Programme 2013

The funding from the (b)(4), (b)(6) co-finances the IARC Monograph Programme on an annual basis.

**Project Role: PI, IARC**

(b)(4), (b)(6)

**Lauby-Secretan, B (PI)**

**01/01/12-12/31/12**

The IARC Monographs Programme 2012

The funding from the (b)(4), (b)(6) co-finances the IARC Monograph Programme on an annual basis.

**Project Role: PI, IARC**

**BIOGRAPHICAL SKETCH**

Provide the following information for the Senior/key personnel and other significant contributors.  
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME MATTOCK, Heidi Karen		POSITION TITLE Scientific Editor, IARC Monograph Section	
eRA COMMONS USER NAME (credential, e.g., agency login) (b)(4)			
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	MM/YY	FIELD OF STUDY
University of Sussex, Lewes, England	BSc	06/94	Biology with European Studies (French)
University of Dundee, Dundee, Scotland	PhD	11/99	Biochemistry/Cell Biology

**A. Personal Statement**

With a PhD in cancer research, I have had 14 years' experience as a scientific and technical editor, both in-house and freelance, working mainly for the World Health Organization (WHO). Before joining the IARC Monographs team, I was responsible for editing the *WHO Classification of Tumours* ("Blue Books") and the Joint FAO/WHO Expert Committee on Food Additives and Joint Meeting on Pesticide Residues (JECFA/JMPR) monographs, as well as numerous technical books, reports and journal articles on diverse topics related to health, medicine and development.

**B. Positions and Professional Memberships**

1998-1999 *Research assistant*, CRC Cell Transformation Laboratories, Department of Biochemistry, Medical Sciences Institute, University of Dundee, Scotland

2000-2002 *Scientific editor for World Cancer Report* (a 350-page book directed to a multidisciplinary professional readership and based on a comprehensive appraisal of all aspects of cancer), Office of the Director, IARC, Lyon, France

2003-2009 *Freelance scientific and technical editor*  
Departments within WHO: Special Programme for Research and Training in Tropical Diseases, International Programme on Chemical Safety, HIV/AIDS, Essential Drugs and Medicines Policy, Global Programme on Evidence for Health Policy, *WHO Bulletin*.  
Editor for Joint FAO/WHO Expert Committee on Food Additives and Joint Meeting on Pesticide Residues (JECFA/JMPR), Geneva and Rome, 2003-2009: editing of technical reports and toxicological monographs.  
Other clients: Sanofi-Pasteur MSD, DodetBiosciences, The Academy of Sciences for the Developing World

2009-2012 *Scientific editor for the WHO Classification of Tumours series* (Pathology and Genetics), Section of Molecular Pathology, IARC, Lyon, France

2012- *Scientific editor*, IARC Monographs, IARC, Lyon, France

**Professional Membership**

2014- Member, European Association of Science Editors

**C. Selected Publications**

Grosse Y, Loomis D, Guyton K, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Scoccianti C, Mattock H, Straif K (2014) Carcinogenicity of fluoro-edenite, silicon carbide fibres and whiskers, and carbon nanotubes. *Lancet Oncol.* 2014; 15: 1427-1428 PMID: not yet indexed

- Benbrahim-Tallaa L, Lauby-Secretan B, Loomis D, Guyton K, Grosse Y, El Ghissassi F, Bouvard V, Guha N, Mattock H, Straif K (2014) Carcinogenicity of perfluorooctanoic acid, tetrafluoroethylene, dichloromethane, 1,2-dichloropropane, and 1,3-propane sultone. *Lancet Oncol.*, 15:924–925. PMID: 25225686
- Loomis D, Grosse Y, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Baan R, Mattock H, Straif K (2013) The carcinogenicity of outdoor air pollution. *Lancet Oncol.*, 14:1262–1263. PMID: 25035875
- Grosse Y, Loomis D, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Baan R, Mattock H, Straif K, International Agency for Research on Cancer Monograph Working Group (2013) Carcinogenicity of some drugs and herbal products. *Lancet Oncol.*, 14:807–808. PMID: 24058961
- Guha N, Loomis D, Grosse Y, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Baan R, Mattock H, Straif K; International Agency for Research on Cancer Monograph Working Group (2012). Carcinogenicity of trichloroethylene, tetrachloroethylene, some other chlorinated solvents, and their metabolites. *Lancet Oncol.*, 13:1192–1193. PMID: 23323277
- Lauby-Secretan B, Loomis D, Grosse Y, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Baan R, Mattock H, Straif K; International Agency for Research on Cancer Monograph Working Group (2013). Carcinogenicity of polychlorinated biphenyls and polybrominated biphenyls. *Lancet Oncol.*, 14:287–288. PMID: 23499544
- Loomis D, Grosse Y, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Baan R, Mattock H, Straif K, International Agency for Research on Cancer Monograph Working Group (2013) The carcinogenicity of outdoor air pollution. *Lancet Oncol.*, 14:1262–1263. PMID: 25035875
- Mattock H (2002) Brought to book: first steps in publishing. *Science's Next Wave*. Internet article: <http://intl-nextwave.sciencemag.org/cgi/content/full/2002/01/30/3>
- Mattock H, Lane DP, Warbrick E (2001). Inhibition of cell proliferation by the PCNA-binding region of p21 expressed as a GFP-miniprotein. *Exp. Cell Res.*, 265:234–241. PMID: 11302688
- Mattock H, Jares P, Zheleva DI, Lane DP, Warbrick E, Blow JJ (2001). Use of peptides from p21(Waf1/Cip1) to investigate PCNA function in *Xenopus* egg extracts. *Exp. Cell Res.*, 265:242–251. PMID: 11302689

**BIOGRAPHICAL SKETCH**

Provide the following information for the Senior/key personnel and other significant contributors.  
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME BOUVARD, Véronique	POSITION TITLE Scientist		
COMMONS USER NAME (credential, e.g., agency login)			
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	MM/YY	FIELD OF STUDY
Universite Claude Bernard Lyon I (France)	Maitrise	1982	Cellular Biology
Universite Claude Bernard Lyon I (France)	DEA	1983	Microbiological Ecology
Universite Claude Bernard Lyon I (France)	CES	1984	General Immunology
Universite Claude Bernard Lyon I (France)	Doctorat	1987	Microbiology

**A. Personal Statement**

Dr Bouvard is a microbiologist, virologist and molecular biologist with a long experience in basic research mostly on the topic of infectious agents, particularly papillomaviruses, and carcinogenesis. She joined the IARC Monographs since 2006 where her research focuses on environmental risk factors for cancer, more specifically on "infection and cancer". She was the Responsible Officer for the two most recent IARC Monographs on Biological Agents: Volume 100B and Volume 104.

**B. Positions and Honors.****Positions and Employment**

**1987-1989:** Post-doctoral Scientist, Laboratoire de Culture Cutanée, Hôpital St-Sacrement, Québec, Canada

**1990-1997:** Junior Scientist, International Centre for Genetic Engineering and biotechnology (ICGEB) initially part of UNIDO (United Nations Industrial Development Organization), "Virology group", Padriciano, Trieste, Italy.

**1997-2000:** Researcher in molecular biology, "Laboratoire de Cancérogénèse Moléculaire", CEA/CNRS, CEN Fontenay aux Roses, France.

**2001-2003:** Researcher in molecular biology, "Molecular Engines Laboratories", Paris, France.

**2004-2006:** Scientific Specialist, "Infections and Cancer Biology" Group, IARC, Lyon, France.

**2006-** Scientific Specialist, "IARC Monograph Section", IARC, Lyon, France.

**Other Experience and Professional Memberships**

**Since January 2014:** Member of the ANSES expert Committee on Water.

**C. Selected peer-reviewed publications**

1. **V. Bouvard**, A. Storey, D. Pim, L. Banks. Characterization of the human papillomavirus E2 protein: evidence of trans-activation and trans-repression in cervical keratinocytes. EMBO J. 13 (22):5451-5459, 1994. PMID:7957111, PMCID:PMC395503.

2. **V. Bouvard**, T. Zaitchouk, M. Vacher, A. Duthu, M. Canivet, C. Choisy-Rossi, M. Nieruchalski, E. May. Tissue and cell-specific expression of the p53-target genes: bax, fas, mdm2 and waf1/p21, before and following ionising irradiation in mice. Oncogene 19 (5):649-660, 2000. PMID:10698510.

3. **V. Bouvard**, AS Gabet, R. Accardi, SB Sylla, M. Tommasino. The Cutaneous Human Papillomavirus types and Non-melanoma Skin Cancer. In: From Natural History to Vaccines and Beyond, edited by M.Saveria Campo, Caister Academic Press, 2006, p. 269-277.
4. P. Massimi, M. Thomas, **V. Bouvard**, I. Ruberto, M. S. Campo, M. Tommasino, L. Banks. Comparative transforming potential of different human papillomaviruses associated with non-melanoma skin cancer. *Virology* 371 (2):374-379, 2008. PMID:17997466.
5. R. Baan, Y. Grosse, K. Straif, B. Secretan, F. El Ghissassi, **V. Bouvard**, L. Benbrahim-Tallaa, N. Guha, C. Freeman, L. Galichet, V. Coglianò. A review of human carcinogens--Part F: chemical agents and related occupations. *Lancet Oncol* 10 (12):1143-1144, 2009. PMID:19998521.
6. **V. Bouvard**, R. Baan, K. Straif, Y. Grosse, B. Secretan, F. El Ghissassi, L. Benbrahim-Tallaa, N. Guha, C. Freeman, L. Galichet, V. Coglianò. A review of human carcinogens--Part B: biological agents. *Lancet Oncol* 10 (4):321-322, 2009, PMID:19350698.
7. B. Secretan, K. Straif, R. Baan, Y. Grosse, F. El Ghissassi, **V. Bouvard**, L. Benbrahim-Tallaa, N. Guha, C. Freeman, L. Galichet, V. Coglianò. A review of human carcinogens--Part E: tobacco, areca nut, alcohol, coal smoke, and salted fish. *Lancet Oncol* 10 (11):1033-1034, 2009. PMID:19891056.
8. H. R. Shin, J. K. Oh, E. Masuyer, M. P. Curado, **V. Bouvard**, Y. Fang, S. Wiangnon, B. Sripa, S. T. Hong. Comparison of incidence of intrahepatic and extrahepatic cholangiocarcinoma--focus on East and South-Eastern Asia. *Asian Pac.J.Cancer Prev.* 11 (5):1159-1166, 2010. PMID:21198257.
9. R. Baan, Y. Grosse, B. Lauby-Secretan, F. El Ghissassi, **V. Bouvard**, L. Benbrahim-Tallaa, N. Guha, F. Islami, L. Galichet, K. Straif. Carcinogenicity of radiofrequency electromagnetic fields. *Lancet Oncol* 12 (7):624-626, 2011. PMID:21845765.
10. V. J. Coglianò, R. Baan, K. Straif, Y. Grosse, B. Lauby-Secretan, F. El Ghissassi, **V. Bouvard**, L. Benbrahim-Tallaa, N. Guha, C. Freeman, L. Galichet, C. P. Wild. Preventable exposures associated with human cancers. *J.Natl.Cancer Inst.* 103 (24):1827-1839, 2011. PMID:22158127, PMCID:PMC3243677.
11. L. Benbrahim-Tallaa, R. A. Baan, Y. Grosse, B. Lauby-Secretan, F. El Ghissassi, **V. Bouvard**, N. Guha, D. Loomis, K. Straif. Carcinogenicity of diesel-engine and gasoline-engine exhausts and some nitroarenes. *Lancet Oncol.* 13 (7):663-664, 2012. PMID:22946126.
12. **V. Bouvard**, R. A. Baan, Y. Grosse, B. Lauby-Secretan, F. El Ghissassi, L. Benbrahim-Tallaa, N. Guha, K. Straif. Carcinogenicity of malaria and of some polyomaviruses. *Lancet Oncol.* 13 (4):339-340, 2012. PMID:22577663.
13. I. Cornet, **V. Bouvard**, M. S. Campo, M. Thomas, L. Banks, L. Gissmann, J. Lamartine, B. S. Sylla, R. Accardi, M. Tommasino. Comparative analysis of transforming properties of E6 and E7 from different beta human papillomavirus types. *J Virol.* 86 (4):2366-2370, 2012. PMID:22171257, PMCID:PMC3302372.
14. Y. Grosse, D. Loomis, B. Lauby-Secretan, F. El Ghissassi, **V. Bouvard**, L. Benbrahim-Tallaa, N. Guha, R. Baan, H. Mattock, K. Straif. Carcinogenicity of some drugs and herbal products. *Lancet Oncol.* 14 (9):807-808, 2013. PMID:24058961.
15. D. Loomis, Y. Grosse, B. Lauby-Secretan, F. El Ghissassi, **V. Bouvard**, L. Benbrahim-Tallaa, N. Guha, R. Baan, H. Mattock, K. Straif. The carcinogenicity of outdoor air pollution. *Lancet Oncol.* 14 (13):1262-1263, 2013. PMID:25035875.

**BIOGRAPHICAL SKETCH**

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Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME EL GHISSASSI, Fatiha		POSITION TITLE Scientist, IARC Monographs Section	
eRA COMMONS USER NAME (credential, e.g., agency login)			
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	MM/YY	FIELD OF STUDY
Scientific and Medical University, Grenoble, France	BSc	1980	Structural and metabolic biochemistry Organic chemistry
University Claude Bernard Lyon I, France	MSc	1982	Molecular biology, Endocrinology
University Claude Bernard Lyon I	DEA	1983	Biochemistry, Pharmacology
University Jean Moulin Lyon III	BSc of Philosophy	1985	Philosophy antique, classic, moral
University Claude Bernard Lyon I	DSc ( <i>summa cum laude</i> )	1986	Biochemistry, Cystic fibrosis, Bile acids and cholesterol
University Claude Bernard Lyon I	PhD ( <i>summa cum laude</i> )	1995	Biochemistry, toxicology

**A. Personal statement**

My broad background and research in biochemistry with a specific training in chemical genotoxicity form strong qualifications for contributing to IARC Monograph Programme. I apply and expand my experience in the mechanisms of carcinogenicity to the scientific review of the relevant section and I serve as rapporteur in the subgroup on mechanisms in the IARC Monographs meetings. I contribute to advancing methods to systematically apply mechanistic data streams to carcinogen classification. I will contribute to the planning of future Monograph evaluations, providing support on carcinogenic mechanisms or serving as the responsible officer. In summary, I have a demonstrated record of contributing expertise to projects in the area of mechanistic data for carcinogen classification that will benefit this assessment project.

**B. Positions and Employment**

1987-1995 Postgraduate research, Environmental Carcinogens and Host Factors Unit, IARC, Lyon, France  
 1996-1997 Postdoctoral research, Mechanisms of Carcinogenesis Unit, IARC, Lyon, France  
 1997-2001 Postdoctoral research, Léon Bérard Center, Oncogenesis and Tumoral Progression Department, INSERM U590, Lyon, France  
 2002-Present Scientist position, IARC Monographs Section, IARC, Lyon, France

Fellowship

1983-1986 Studentship in biochemistry, for Doctorate es Science degree, Laboratory of Hormonology, Hospital University Center, South Lyon, France

**Other experience and Professional Memberships**

- 2005-2011 Member, National Working Group for the construction of toxicological reference values (VTR) for carcinogenic and chemical compounds, French Agency for Environmental and Occupational Health and Safety, AFSSET, Paris
- 2012-2013 Member, Specialist Experts Committee on "Limit Values in Occupational Workplace" (CES-VLEP) French National Agency for Health Safety of Diet, Environment and Occupational workplace", ANSES, Paris
- 2014-present Member, CES "Characterisation of Hazard Substances and VTR", ANSES, Paris

**C. Selected peer-reviewed publications.****Most relevant for the current application**

- Grosse Y, Loomis D, Guyton K, Lauby-Secretan B, **El Ghissassi F**, Bouvard V, Benbrahim-Tallaa L, Guha N, Scoccianti C, Mattock H, Straif K, International Agency for Research on Cancer Monograph Working Group. Carcinogenicity of fluoro-edenite, silicon carbide fibres and whiskers, and carbon nanotubes. *Lancet Oncol.* 2014 Nov; Published online October 31, 2014. [http://dx.doi.org/10.1016/S1470-2045\(14\)71109-X](http://dx.doi.org/10.1016/S1470-2045(14)71109-X)
- Benbrahim-Tallaa L, Lauby-Secretan B, Loomis, Guyton K, Grosse Y, **El Ghissassi F**, Bouvard V, Guha N, Mattock H, Straif K, on behalf of the International Agency for Research on Cancer Monograph Working Group. Carcinogenicity of perfluorooctanoic acid, tetrafluoroethylene, dichloromethane, 1,2-dichloropropane, and 1,3-propane sultone. *Lancet Oncol.* 2014 Aug;15(9):924-5. PMID: 25225686
- Straif K, Loomis D, Guyton K, Grosse Y, Lauby-Secretan B, **El Ghissassi F**, Bouvard v, Benbrahim-Tallaa L, Guha N, Mattock H. Future priorities for the IARC Monographs. *Lancet Oncol.* Published online May 6, 2014 [http://dx.doi.org/10.1016/S1470-2045\(14\)70168-8](http://dx.doi.org/10.1016/S1470-2045(14)70168-8)
- Loomis D, Grosse Y, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Baan R, Mattock H, Straif K; International Agency for Research on Cancer Monograph Working Group IARC. The carcinogenicity of outdoor air pollution. *Lancet Oncol.* 2013 Dec;14(13):1262-3. PMID: 25035875
- Lauby-Secretan B, Loomis D, Grosse Y, **El Ghissassi F**, Bouvard V, Benbrahim-Tallaa L, Guha N, Baan R, Mattock H, Straif K; International Agency for Research on Cancer Monograph Working Group IARC, Lyon, France. Carcinogenicity of polychlorinated biphenyls and polybrominated biphenyls. *Lancet Oncol.* 2013 Apr;14(4):287-8. PMID: 23499544
- Guha N, Loomis D, Grosse Y, Lauby-Secretan B, **El Ghissassi F**, Bouvard V, Benbrahim-Tallaa L, Baan R, Mattock H, Straif K; International Agency for Research on Cancer Monograph Working Group. Carcinogenicity of trichloroethylene, tetrachloroethylene, some other chlorinated solvents, and their metabolites. *Lancet Oncol.* 2012 Dec;13(12):1192-3. PMID: 23323277
- Cogliano VJ, Baan R, Straif K, Grosse Y, Lauby-Secretan B, **El Ghissassi F**, Bouvard V, Benbrahim-Tallaa L, Guha N, Freeman C, Galichet L, Wild CP. Preventable exposures associated with human cancers. *J Natl Cancer Inst.* 2011 Dec 21;103(24):1827-39. PMID: 22158127, PMCID:PMC3243677
- Baan R, Grosse Y, Straif K, Secretan B, **El Ghissassi F**, Bouvard V, Benbrahim-Tallaa L, Guha N, Freeman C, Galichet L, Coglian V; WHO International Agency for Research on Cancer Monograph Working Group (2009) A review of human carcinogens--Part F: chemical agents and related occupations. *Lancet Oncol.*,10, 1143-1144. PMID: 19998521
- El Ghissassi F**, Baan R, Straif K, Grosse Y, Secretan B, Bouvard V, Benbrahim-Tallaa L, Guha N, Freeman C, Galichet L, Coglian V; WHO International Agency for Research on Cancer Monograph Working Group (2009) A review of human carcinogens--part D: radiation. *Lancet Oncol.*, 10, 751-752. PMID: 19655431

### **Primary Research Articles—Mechanisms**

- El Ghissassi F.**, Boivin S., LeFrançois L., Barbin A. & Marion M.J. (1995) Glutathione transferase *Mu1-1* (*GSTM1*) genotype in individuals exposed to vinyl chloride in relation to "vinyl chloride disease" and liver angiosarcoma. *Clin. Chem. (Suppl)*, 41, 1922-1924. (Suppl Not available in PUBMED)
- El Ghissassi F.**, Barbin A., Nair J. & Bartsch H. (1995) Formation of 1,*N*<sup>6</sup>-ethenoadenine and 3,*N*<sup>4</sup>-ethenocytosine by lipid peroxidation products and nucleic acids bases. *Chem. Res. Toxicol*, 8, 278-283. PMID: 7766812
- Guichard Y., **El Ghissassi F.**, Nair J., Bartsch H. & Barbin A. (1996) Formation and accumulation of DNA ethenobases in adult Sprague-Dawley rats exposed to vinyl chloride. *Carcinogenesis*, 17, 1553-1559. PMID: 8761409
- El Ghissassi F.**, Barbin A. & Bartsch H. (1998) Metabolic activation of vinyl chloride by rat liver microsomes: low-dose kinetics and involvement of cytochrome P450 2E1. *Bioche. Pharmacol.*, 55, 1445-1452. PMID: 10076537
- North S., **El Ghissassi F.**, Pluquet O., Verhaegh G. & Hainaut P. (2000) The cytoprotective aminothiols WR1065 activates p21waf-1 and down regulates cell cycle progression through a p53-dependent pathway. *Oncogene*, 19, 1206-14. North S. and **El Ghissassi F.** contributed equally to this paper. PMID: 10713709
- El Ghissassi F.**, Valsesia-Wittmann S., Falette N., Duriez C., Walden P.D. & Puisieux A. (2002) BTG2(TIS21/PC3) induces neuronal differentiation and prevents apoptosis of terminally differentiated PC12 cells. *Oncogene*, 21, 6772-6778. PMID: 12360398

**BIOGRAPHICAL SKETCH**

Provide the following information for the Senior/key personnel and other significant contributors.  
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME GUHA, Neela	POSITION TITLE Scientist, IARC Monographs Section		
eRA COMMONS USER NAME (credential, e.g., agency login)			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	MM/YY	FIELD OF STUDY
University of California, Berkeley	B.A.	2000	Molecular and Cell Biology, Genetics
University of California, Berkeley	M.P.H.	2004	Epidemiology/Biostatistics
University of California, Berkeley	Ph.D.	2009	Epidemiology

**A. Personal Statement**

I have worked for the IARC Monographs since 2008. My research focuses on environmental risk factors for cancer and I have ample experience in conducting systematic reviews, meta-analyses, and pooled analyses. I also serve on national and international committees conducting hazard identification or focusing on the primary and secondary prevention of cancer.

**B. Position and Honors****Positions and Employment**

1998-1999 Research Assistant, Dept. of Surgical Oncology, University of California San Francisco  
 1999-2000 Research Assistant, Lawrence Berkeley National Laboratory, Berkeley, CA  
 2000-2000 Research Assistant, University of California at Berkeley Sequencing Facility  
 2000-2002 Staff Research Associate, Dept. of Surgical Oncology, University of California at San Francisco  
 2002-2004 Graduate Student Researcher, University of California at Berkeley  
 2003-2003 Researcher, California Department of Health Services, Environmental Health Investigations Branch, Oakland, CA  
 2004-2005 Special Training Awardee, International Agency for Research on Cancer, Lyon, France  
 2007-2007 Research Fellow, Kaiser Permanente Division of Research, Oakland, CA  
 2007-2007 Graduate Student Instructor, University of California at Berkeley  
 2008-present Scientist, International Agency for Research on Cancer, Lyon, France

**Other Experience and Professional Memberships**

2012-present European Code Against Cancer, European Commission/IARC; Working Group member on Tobacco and Cancer  
 2013-present US National Toxicology Program, Report on Carcinogens – Invited Technical Advisor for the review of Trichloroethylene  
 2014-present Member, International Committee on Occupational Health  
 2007-2008 Member, European Association of Cancer Research  
 2012-2013 Member, Society for Risk Analysis

**Honors**

2004 Special Training Award, International Agency for Research on Cancer  
 2006 Susan Kersch DeYoung Memorial Scholarship  
 2007 Kaiser Permanent-UCB Center for Health Research Fellowship  
 2008 Russell M. Grossman Endowment

**C. Selected peer-reviewed publications (in chronological order)**

1: Hamra GB, **Guha N**, Cohen A, Laden F, Raaschou-Nielsen O, Samet JM, Vineis P, Forastiere F, Saldiva P, Yorifuji T, Loomis D. Outdoor Particulate Matter Exposure and Lung Cancer: A Systematic Review and Meta-Analysis. *Environ Health Perspect.* 2014; 122(9): 906-11. doi: 10.1289/ehp.1408092 Epub 2014 June 3. PubMed PMID:24911640; PubMed Central PMCID: 4154221

2: Vlaanderen J, Straif K, Ruder A, Blair A, Hansen J, Lynge E, Charbotel B, Loomis D, Kauppinen T, Kyyronen P, Pukkala E, Weiderpass E, **Guha N**. Tetrachloroethylene exposure and bladder cancer risk: a meta-analysis of dry-cleaning-worker studies. *Environ Health Perspect.* 2014 Jul;122(7):661-6. doi: 10.1289/ehp.1307055. Epub 2014 Mar 20. PubMed PMID: 24659585; PubMed Central PMCID: PMC4080536.

3: **Guha N**, Warnakulasuriya S, Vlaanderen J, Straif K. Betel quid chewing and the risk of oral and oropharyngeal cancers: A meta-analysis with implications for cancer control. *Int J Cancer.* 2014 Sep 15;135(6):1433-43. doi: 10.1002/ijc.28643. Epub 2014 May 14. PubMed PMID: 24302487.

4: Grosse Y, Loomis D, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, **Guha N**, Baan R, Mattock H, Straif K; International Agency for Research on Cancer Monograph Working Group. Carcinogenicity of some drugs and herbal products. *Lancet Oncol.* 2013 Aug;14(9):807-8. PubMed PMID: 24058961.

5: Lauby-Secretan B, Loomis D, Grosse Y, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, **Guha N**, Baan R, Mattock H, Straif K; International Agency for Research on Cancer Monograph Working Group IARC, Lyon, France. Carcinogenicity of polychlorinated biphenyls and polybrominated biphenyls. *Lancet Oncol.* 2013 Apr;14(4):287-8. doi: 10.1016/S1470-2045(13)70104-9. Epub 2013 Mar 15. PubMed PMID: 23499544.

6: **Guha N**, Loomis D, Grosse Y, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Baan R, Mattock H, Straif K; International Agency for Research on Cancer Monograph Working Group. Carcinogenicity of trichloroethylene, tetrachloroethylene, some other chlorinated solvents, and their metabolites. *Lancet Oncol.* 2012 Dec;13(12):1192-3. PubMed PMID: 23323277.

7: **Guha N**, Ward MH, Gunier R, Colt JS, Lea CS, Buffler PA, Metayer C. Characterization of residential pesticide use and chemical formulations through self-report and household inventory: the Northern California Childhood Leukemia study. *Environ Health Perspect.* 2013 Feb;121(2):276-82. doi: 10.1289/ehp.1204926. Epub 2012 Oct 24. PubMed PMID: 23110983; PubMed Central PMCID: PMC3569677.

8: Benbrahim-Tallaa L, Baan RA, Grosse Y, Lauby-Secretan B, El Ghissassi F, Bouvard V, **Guha N**, Loomis D, Straif K; International Agency for Research on Cancer Monograph Working Group. Carcinogenicity of diesel-engine and gasoline-engine exhausts and some nitroarenes. *Lancet Oncol.* 2012 Jul;13(7):663-4. PubMed PMID: 22946126.

9: Chokkalingam AP, Metayer C, Scelo GA, Chang JS, Urayama KY, Aldrich MC, **Guha N**, Hansen HM, Dahl GV, Barcellos LF, Wiencke JK, Wiemels JL, Buffler PA. Variation in xenobiotic transport and metabolism genes, household chemical exposures, and risk of childhood acute lymphoblastic leukemia. *Cancer Causes Control.* 2012 Aug;23(8):1367-75. doi: 10.1007/s10552-012-9947-4. Epub 2012 Jun 7. PubMed PMID: 22674224; PubMed Central PMCID: PMC3390694.

10: Bouvard V, Baan RA, Grosse Y, Lauby-Secretan B, El Ghissassi F, Benbrahim-Tallaa L, **Guha N**, Straif K; WHO International Agency for Research on Cancer Monograph Working Group. Carcinogenicity of malaria and of some polyomaviruses. *Lancet Oncol.* 2012 Apr;13(4):339-40. Epub 2012 Mar 16. PubMed PMID: 22577663.

11: Lauby-Secretan B, Baan R, Grosse Y, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, **Guha N**, Galichet L, Straif K; WHO International Agency for Research on Cancer Monograph Working Group. Bitumens and bitumen emissions, and some heterocyclic polycyclic aromatic hydrocarbons. *Lancet Oncol.* 2011 Dec;12(13):1190-1. PubMed PMID: 22232803.

12: Cogliano VJ, Baan R, Straif K, Grosse Y, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, **Guha N**, Freeman C, Galichet L, Wild CP. Preventable exposures associated with human cancers. *J Natl Cancer Inst.* 2011 Dec 21;103(24):1827-39. doi: 10.1093/jnci/djr483. Epub 2011 Dec 12. Review. PubMed PMID: 22158127; PubMed Central PMCID: PMC3243677.

13: Chang JS, Straif K, **Guha N**. The role of alcohol dehydrogenase genes in head and neck cancers: a systematic review and meta-analysis of ADH1B and ADH1C. *Mutagenesis.* 2012 May;27(3):275-86. doi: 10.1093/mutage/ger073. Epub 2011 Oct 31. Review. PubMed PMID: 22042713.

14: Chokkalingam AP, Bartley K, Wiemels JL, Metayer C, Barcellos LF, Hansen HM, Aldrich MC, **Guha N**, Urayama KY, Scélo G, Chang JS, Month SR, Wiencke JK, Buffler PA. Haplotypes of DNA repair and cell cycle control genes, X-ray exposure, and risk of childhood acute lymphoblastic leukemia. *Cancer Causes Control.* 2011 Dec;22(12):1721-30. doi: 10.1007/s10552-011-9848-y. Epub 2011 Oct 11. PubMed PMID: 21987080; PubMed Central PMCID: PMC3206192.

15: Baan R, Grosse Y, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, **Guha N**, Islami F, Galichet L, Straif K; WHO International Agency for Research on Cancer Monograph Working Group. Carcinogenicity of radiofrequency electromagnetic fields. *Lancet Oncol.* 2011 Jul;12(7):624-6. PubMed PMID: 21845765.

16: **Guha N**, Straif K, Benbrahim-Tallaa L. The IARC Monographs on the carcinogenicity of crystalline silica. *Med Lav.* 2011 Jul-Aug;102(4):310-20. Review. PubMed PMID: 21834268.

17: Metayer C, Scélo G, Chokkalingam AP, Barcellos LF, Aldrich MC, Chang JS, **Guha N**, Urayama KY, Hansen HM, Block G, Kiley V, Wiencke JK, Wiemels JL, Buffler PA. Genetic variants in the folate pathway and risk of childhood acute lymphoblastic leukemia. *Cancer Causes Control.* 2011 Sep;22(9):1243-58. doi: 10.1007/s10552-011-9795-7. Epub 2011 Jul 12. PubMed PMID: 21748308; PubMed Central PMCID: PMC3744066.

18: Grosse Y, Baan R, Secretan-Lauby B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, **Guha N**, Islami F, Galichet L, Straif K; WHO International Agency for Research on Cancer Monograph Working Group. Carcinogenicity of chemicals in industrial and consumer products, food contaminants and flavourings, and water chlorination byproducts. *Lancet Oncol.* 2011 Apr;12(4):328-9. PubMed PMID: 21598447.

19: Chang JS, Wiemels JL, Chokkalingam AP, Metayer C, Barcellos LF, Hansen HM, Aldrich MC, **Guha N**, Urayama KY, Scélo G, Green J, May SL, Kiley VA, Wiencke JK, Buffler PA. Genetic polymorphisms in adaptive immunity genes and childhood acute lymphoblastic leukemia. *Cancer Epidemiol Biomarkers Prev.* 2010 Sep;19(9):2152-63. doi: 10.1158/1055-9965.EPI-10-0389. Epub 2010 Aug 17. PubMed PMID: 20716621; PubMed Central PMCID: PMC3257312.

20: **Guha N**, Steenland NK, Merletti F, Altieri A, Cogliano V, Straif K. Bladder cancer risk in painters: a meta-analysis. *Occup Environ Med.* 2010 Aug;67(8):568-73. doi: 10.1136/oem.2009.051565. Review. PubMed PMID: 20647380.

21: **Guha N**, Merletti F, Steenland NK, Altieri A, Cogliano V, Straif K. Lung cancer risk in painters: a meta-analysis. *Environ Health Perspect.* 2010 Mar;118(3):303-12. doi: 10.1289/ehp.0901402. Epub 2009 Oct 22. Review. PubMed PMID: 20064777; PubMed Central PMCID: PMC2854755.

22: Baan R, Grosse Y, Straif K, Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, **Guha N**, Freeman C, Galichet L, Cogliano V; WHO International Agency for Research on Cancer Monograph Working Group. A review of human carcinogens--Part F: chemical agents and related occupations. *Lancet Oncol.* 2009 Dec;10(12):1143-4. PubMed PMID: 19998521.

- 23: Secretan B, Straif K, Baan R, Grosse Y, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, **Guha N**, Freeman C, Galichet L, Coglianò V; WHO International Agency for Research on Cancer Monograph Working Group. A review of human carcinogens--Part E: tobacco, areca nut, alcohol, coal smoke, and salted fish. *Lancet Oncol.* 2009 Nov;10(11):1033-4. PubMed PMID: 19891056.
- 24: El Ghissassi F, Baan R, Straif K, Grosse Y, Secretan B, Bouvard V, Benbrahim-Tallaa L, **Guha N**, Freeman C, Galichet L, Coglianò V; WHO International Agency for Research on Cancer Monograph Working Group. A review of human carcinogens--part D: radiation. *Lancet Oncol.* 2009 Aug;10(8):751-2. PubMed PMID: 19655431.
- 25: Straif K, Benbrahim-Tallaa L, Baan R, Grosse Y, Secretan B, El Ghissassi F, Bouvard V, **Guha N**, Freeman C, Galichet L, Coglianò V; WHO International Agency for Research on Cancer Monograph Working Group. A review of human carcinogens--part C: metals, arsenic, dusts, and fibres. *Lancet Oncol.* 2009 May;10(5):453-4. PubMed PMID: 19418618.
- 26: Bouvard V, Baan R, Straif K, Grosse Y, Secretan B, El Ghissassi F, Benbrahim-Tallaa L, **Guha N**, Freeman C, Galichet L, Coglianò V; WHO International Agency for Research on Cancer Monograph Working Group. A review of human carcinogens--Part B: biological agents. *Lancet Oncol.* 2009 Apr;10(4):321-2. PubMed PMID: 19350698.
- 27: Coglianò V, Baan R, Straif K, Grosse Y, Secretan B, El Ghissassi F, Bouvard V, Lamia Benbrahim-Tallaa, **Guha N**. Future priorities for IARC monographs. *Lancet Oncol.* 2008 Aug;9(8):708. PubMed PMID: 19274804.
- 28: **Guha N**, Kwan ML, Quesenberry CP Jr, Weltzien EK, Castillo AL, Caan BJ. Soy isoflavones and risk of cancer recurrence in a cohort of breast cancer survivors: the Life After Cancer Epidemiology study. *Breast Cancer Res Treat.* 2009 Nov;118(2):395-405. doi: 10.1007/s10549-009-0321-5. Epub 2009 Feb 17. PubMed PMID: 19221874; PubMed Central PMCID: PMC3470874.
- 29: Grosse Y, Baan R, Straif K, Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, **Guha N**, Galichet L, Coglianò V; WHO International Agency for Research on Cancer Monograph Working Group. A review of human carcinogens-Part A: pharmaceuticals. *Lancet Oncol.* 2009 Jan;10(1):13-4. PubMed PMID: 19115512.
- 30: **Guha N**, Chang JS, Chokkalingam AP, Wiemels JL, Smith MT, Buffler PA. NQO1 polymorphisms and de novo childhood leukemia: a HuGE review and meta-analysis. *Am J Epidemiol.* 2008 Dec 1;168(11):1221-32. doi: 10.1093/aje/kwn246. Epub 2008 Oct 22. Review. Erratum in: *Am J Epidemiol.* 2009 May 15;169(10):1280. PubMed PMID: 18945694; PubMed Central PMCID: PMC2727266.
- 31: **Guha N**, Boffetta P, Wünsch Filho V, Eluf Neto J, Shangina O, Zaridze D, Curado MP, Koifman S, Matos E, Menezes A, Szeszenia-Dabrowska N, Fernandez L, Mates D, Daudt AW, Lissowska J, Dikshit R, Brennan P. Oral health and risk of squamous cell carcinoma of the head and neck and esophagus: results of two multicentric case-control studies. *Am J Epidemiol.* 2007 Nov 15;166(10):1159-73. Epub 2007 Aug 30. PubMed PMID: 17761691.
- 32: Arvola ND, **Guha N**, Wang D, Matli M, Deen DF, Warren RS, Haas-Kogan DA. Hypoxia-induced radioresistance is independent of hypoxia-inducible factor-1A in vitro. *Int J Radiat Oncol Biol Phys.* 2005 May 1;62(1):207-12. PubMed PMID:15850923.
- \*co-first authorship work

## BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.  
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME <b>Benbrahim-TALLAA, Lamia</b>	POSITION TITLE <b>Scientist, IARC Monographs Section</b>		
eRA COMMONS USER NAME (credential, e.g., agency login) <span style="background-color: black; color: red;">(b)(4)</span>			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	MM/YY	FIELD OF STUDY
USTHB, Algiers, Algeria	BSc	1991	Endocrinology
Claude Bernard University, Lyon I, France	BSc	1996	Physiology, Endocrinology, Metabolism
Claude Bernard University, Lyon I, France	MSc	1997	Metabolism, Endocrinology, Nutrition
INSERM/Lyon I, France	PhD	2001	Toxicology, Molecular biology

### A. Personal Statement

I am a toxicologist and molecular biologist with a long experience in basic research mostly on toxicology and metals carcinogenesis. Since 2007, I served as the Co-Responsible Officer for Volume 100C (metals and fibers), and as a Responsible Officer for Volumes 105 (diesel and gasoline exhaust and some nitroarenes) and 110 (perfluoro-octanoic acid, fluoroethylene, dichloromethane, 1,2-dichloropropane, propane sultone) which entailed the preparation of the meeting, supervision and management of the checking, final read and correcting of this Volume for publication online. I regularly serve as a rapporteur during the regular Working Group meetings. Outside the IARC, I had maintained my professional standing at an international level by being a reviewer for several scientific journals, a junior councilor for a Society of Toxicology Specialty Section, a Special volunteer at the National Toxicology Programme, by co-authoring over 40 scientific publications and communications, and by attending international scientific meetings.

### B. Positions and Honors

#### Positions

2001: PhD, INSERM/Claude Bernard University, Lyon I, France  
 2002 - 2007: PostDoc: National Cancer Institute at NIEHS, NC  
 2007 - Present: Scientist, IARC Monographs Section

#### Honors

1999: Fellowship, INSERM graduate program, A.R.C. (Association for Research on Cancer, France)  
 2005: SOT Award for Research Excellence in Carcinogenesis  
 2006: SOT Award for Research Excellence in Metal Carcinogenesis  
 2007: SOT/MERCK Award for Meritorious Research (Mechanisms Specialty Section)  
 2014: Honors in appreciation of distinguished service as Councilor of the stem cells specialty section (2012-2014)

#### Other professional activities

2013 - Present: Member of the IARC Advisory Group on Publication committee (ACP).  
 2009 -2012: Member of the editorial board of *Toxicology and Applied Pharmacology* journal.

### C. Selected Peer-reviewed Publications

**Benbrahim-Tallaa L**, Lauby-Secretan B, Loomis D, Grosse Y, El Ghissassi F, Bouvard V, Guha N, Straif K. Carcinogenicity of perfluorooctanoic acid, tetrafluoroethylene, dichloromethane, 1,2-dichloropropane, and 1,3-propane sultone. *Lancet oncol* 2014; 15:924-925. PMID: 25225686

**Benbrahim-Tallaa L**, Baan R, Grosse Y, Lauby-Secretan B, El Ghissassi F, Bouvard V, Guha N, Loomis D, Straif K. Carcinogenicity of diesel-engine and gasoline-engine exhausts and some nitroarenes. *Lancet oncol* 2012; 13:663-664. PMID: 22946126

Guha N, Straif K, **Benbrahim-Tallaa L**. The IARC Monographs on the Carcinogenicity of Crystalline Silica. *Med Lav*. 2011; 310-20. Review. PMID: 21834268

Tokar EJ, **Benbrahim-Tallaa L**, Waalkes MP. Metal ions in human cancer development. In: Siegel A, Siegel H, Siegel RKO, Eds, *Metal ions in life sciences*, RSC Publishing, Cambridge, UK, 2011; 375-401. PMID: 21473387

Tokar EJ, **Benbrahim-Tallaa L**, Ward JM, Lunn R, Sams RL, Waalkes MP. Cancer in experimental animals exposed to arsenic and arsenic compounds. *Crit Rev Toxicol* 2010; 40:912-927. Review. PMID: 20812815, PMCID: PMC3076186

**Benbrahim-Tallaa L**, Tokar EJ, Diwan BA, Dill AL, Coppin JF, and Waalkes MP. Cadmium Malignantly Transforms Normal Human Breast Epithelial Cells into a Basal-like Phenotype. *Environ Health Perspect* 2009; 117:1847-1852. [note: Manuscript highlighted in Science Selections section pp A552]. PMID: 20049202, PMCID: PMC2799457

Straif K, **Benbrahim-Tallaa L**, Baan R, Grosse Y, Secretan B, El Ghissassi F, Bouvard V, Guha N, Galichet L, Coglianò V. A review of human carcinogens— Part C: metals, arsenic, dusts, and fibres. *Lancet oncol*. 2009; 10:453-454. PMID: 19418618

**Benbrahim-Tallaa L** and Waalkes MP. Inorganic arsenic and prostate cancer. *Environ Health Perspect* 2008; 116:158-164. PMID: 18288312, PMCID: PMC2235216

**Benbrahim-Tallaa L**, Siddeek B, Bozec A, Tronchon V, Florin A, Friry C, Tabone E, Mauduit C, and Benahmed M. Alterations of Sertoli cell activity in the long-term testicular germ cell death process induced by fetal androgen disruption *J. Endocrinol* 2008 196:21-31. PMID: 18180314

**Benbrahim-Tallaa L**, Waterland RA, Webber MM and Waalkes MP. Tumor Suppressor Gene Inactivation During Cadmium-induced malignant transformation of human prostate cells correlates with over-expression of *de novo* DNA methyltransferase. *Environ Health Perspect* 2007; 115:1454-1459. PMID: 17938735, PMCID: PMC2022656

Xie Y, Liu J, **Benbrahim-Tallaa L**, Ward JM, Logston D, Diwan BA, Waalkes MP. Aberrant DNA methylation and gene expression in livers of newborn mice transplacentally exposed to a hepatocarcinogenic dose of inorganic arsenic. *Toxicology*. 2007; 236:7-15. PMID: 17451858, PMC2465467

**Benbrahim-Tallaa L**, Webber MM and Waalkes MP. Mechanisms of acquired androgen independence during arsenic-induced malignant transformation of human prostate epithelial cells. *Environ Health Perspect* 2007; 115:143-147. PMID: 17384772; PMCID: PMC1817693

**Benbrahim-Tallaa L**, Liu J, Webber MM and Waalkes MP. Estrogen signaling and disruption of androgen metabolism in acquired androgen-independence during cadmium carcinogenesis in human prostate epithelial cells. *Prostate* 2007; 67:135-145. PMID: 17075824

Liu J, **Benbrahim-Tallaa L**, Qian X, Yu L, Xie Y, Boos J, Qu W, Waalkes MP. Further studies on aberrant gene expression associated with arsenic-induced malignant transformation in rat liver TRL 1215 cells. *Toxicol Appl Pharmacol*. 2006; 216:407-415. PMID: 16876216

**Benbrahim-Tallaa L**, Webber MM and Waalkes MP. Acquisition of androgen-independence in human prostate epithelial cells during arsenic-induced malignant transformation. *Environ Health Perspect* 2005; 113:1134-1139. [note: **Manuscript highlighted in Science Selections section**]. PMID: 16140617; PMCID: PMC1280391

**Benbrahim-Tallaa L**, Waterland RA, Webber MM and Waalkes MP. Molecular Events Associated with arsenic-induced malignant transformation of human prostatic epithelial cells: aberrant genomic DNA methylation and K-ras oncogene activation. *Toxicol Appl Pharmacol.* 2005; 206:288-298. PMID: 16039940

**D. Research Support***CURRENT***U01CA033193 (NCI)****Straif, K (PI)****09/01/10-08/31/15**

Evaluation of Carcinogenic Risks to Humans - Y28 - Y33

This project supports the IARC Monographs Program that started in 1971 and has been co-financed by the NCI since 1982. The IARC Monographs program convenes meetings of advisory groups to prioritize suspected cancer agents that are suggested by individuals and organizations worldwide. Advisory groups are composed of senior officials and scientists from international health agencies and cancer research institutions. Agents are prioritized by the extent of human exposure, suspicion of carcinogenicity, public health relevance and public concern.

**Project Role: PI, IARC****Direct funding (NIEHS)****Straif, K (PI)****09/01/14-08/31/15**

Evaluation of Carcinogenic Risks to Humans

The NIEHS co-finances the IARC Monograph Programme on an annual basis.

**Project Role: PI, IARC****(b)(4), (b)(6)****Straif, K (PI)****01/01/14-12/31/15**

The IARC Handbooks of Cancer Prevention: Breast Cancer Screening

In 1995, the IARC Handbooks of Cancer Prevention were launched to complement the IARC Monographs by providing evaluations of approaches to cancer prevention. This funding partly covers the latest Prevention Handbook looking at breast cancer screening.

**Project Role: PI, IARC****(b)(4), (b)(6)****Loomis, D (PI)****01/01/14-12/31/14**

The IARC Monographs Programme 2014

The funding from the **(b)(4), (b)(6)** co-finances the IARC Monograph Programme on an annual basis.

**Project Role: Co-investigator, IARC***COMPLETED***U01CA033193 (NCI)****Straif, K (PI)****09/01/13-08/31/14**

Evaluation of Carcinogenic Risks to Humans - Y32 - supplemental award

This administrative supplement to the Monograph Programme is intended to co-finance the establishment of a fully searchable online database of the IARC Monographs with graphical user interface, and particularly linking it with the US NCI grants database.

**Project Role: PI, IARC****(b)(4), (b)(6)****Fensel, D (PI)****04/01/08-09/30/11**

The Large Knowledge Collider (LarKC)

This project intended to develop a platform for large scale integrated reasoning and Web search with applications to the Monographs.

**Project Role: Co-investigator, IARC****Direct funding (NIEHS)****Straif, K (PI)****09/01/13-08/31/14**

Evaluation of Carcinogenic Risks to Humans

The NIEHS co-finances the IARC Monograph Programme on an annual basis.

**Project Role: PI, IARC****Direct funding (NIEHS)****Straif, K (PI)****09/01/12-08/31/13**

Evaluation of Carcinogenic Risks to Humans

The NIEHS co-finances the IARC Monograph Programme on an annual basis.

**Project Role: PI, IARC**

**Direct funding (NIEHS)**

**Straif, K (PI)**

**09/01/11-08/31/12**

Evaluation of Carcinogenic Risks to Humans

The NIEHS co-finances the IARC Monograph Programme on an annual basis.

**Project Role: PI, IARC**

**(b)(4), (b)(6)**

**Straif, K (PI)**

**08/27/09-03/27/12**

Occupational and environmental risk factors of lung cancer 2009-11

The main objective of this project was to assess the risk of lung cancer from combined exposure to occupational and environmental agents.

**Project Role: PI, IARC**

**(b)(4), (b)(6)**

**Straif, K (PI)**

**01/01/07-12/31/11**

Pooled analysis of Case-Control Studies on the Interaction of Occupational Carcinogens in the Development of Lung Cancer (SYNERGY)

This project intended to study effect modification in a pooled analysis of occupational risk factors for lung cancer.

**Project Role: PI, IARC**

**(b)(4), (b)(6)**

**Straif, K (PI)**

**01/01/07-12/31/11**

**(b)(4), (b)(6)** Exposure Assessment for Shift-work 2009.

This project intended to develop recommendations for exposure assessment in studies on shift-work and cancer, following requests from the Scientific Community after the IARC Monographs evaluation of shiftwork as probably carcinogenic to humans.

**Project Role: PI, IARC**

## D. Research Support

### *CURRENT*

(b)(4), (b)(6) Loomis, D (PI)  
01/01/14-12/31/14

The IARC Monographs Programme 2014

The funding from the (b)(4), (b)(6) co-finances the IARC Monograph Programme on an annual basis.

**Project Role: PI, IARC**

### *COMPLETED*

R01 ES015326-01A1 (NIEHS) Styblo, M (PI)  
08/07/08-05/31/13

Environmental Arsenic and Diabetes Mellitus

This is a translational research project that examines the association between environmental exposures to arsenic and diabetes mellitus, focusing on arsenic metabolism as a key determinant of the outcome of exposure. Cell culture, animal and human population studies are included in this project.

R01 CA117841 (NCI) Loomis, D (PI)  
01/07-12/12

Cohort analysis methods for occupational cancer studies

Subcontract to the University of North Carolina, D. Richardson, PI

Agency: NCI Period:

This competing renewal of a current R01 project continues development of analytical methods for occupational cohort studies.

**Project Role: PI, UNR**

U54 OH 010162 (NIOSH) Loomis, D (Co-PI)  
10/01/11-09/29/16

**Central States Center for Agricultural Safety and Health**

This grant establishes the Central States Center for Agricultural Safety and Health, a multi-disciplinary research center focusing primarily on respiratory disease research, injury prevention, and educational needs of farmers and ranchers.

**Project Role: Deputy Director** (Note: responsibility for this project passed to others upon my departure from the University of Nebraska).

## D. Research Support

COMPLETED

(b)(4), (b)(6) Lauby-Secretan, B (PI) 01/01/13-12/31/13

The IARC Monographs Programme 2013

The funding from the European Commission co-finances the IARC Monograph Programme on an annual basis.

**Project Role: PI, IARC**

(b)(4), (b)(6) Lauby-Secretan, B (PI) 01/01/12-12/31/12

The IARC Monographs Programme 2012

The funding from the (b)(4), (b)(6) co-finances the IARC Monograph Programme on an annual basis.

**Project Role: PI, IARC**

## RESEARCH & RELATED BUDGET - SECTION A & B, Budget Period 1

**ORGANIZATIONAL DUNS\*:** 2795518810000

**Budget Type\*:**  Project  Subaward/Consortium

**Enter name of Organization:** International Agency for Research on Cancer

**Start Date\*:** 09-01-2015

**End Date\*:** 08-31-2016

**Budget Period:** 1

A. Senior/Key Person												
Prefix	First Name*	Middle Name	Last Name*	Suffix	Project Role*	Base Salary (\$)	Calendar Months	Academic Months	Summer Months	Requested Salary (\$)*	Fringe Benefits (\$)*	Funds Requested (\$)*
1 .	Dr.	Kurt	Straif		PD/PI	(b)(4), (b)(6)				0.00	0.00	0.00
2 .	Dr.	Dana	Loomis		Co-investigator	(b)(4), (b)(6)				0.00	0.00	0.00
3 .	Dr.	Kathryn	Guyton		Co-investigator	(b)(4), (b)(6)				0.00	0.00	0.00
4 .	Dr.	Yann	Grosse		Co-investigator	(b)(4), (b)(6)				0.00	0.00	0.00
5 .	Dr.	B??atrice	Lauby-Secretan		Co-investigator	(b)(4), (b)(6)				0.00	0.00	0.00
6 .	Dr.	Heidi	Mattock		Co-investigator	(b)(4), (b)(6)				65,915.00	17,164.00	83,079.00
7 .	Dr.	V??ronique	Bouvard		Co-investigator	(b)(4), (b)(6)				80,255.00	22,051.00	102,306.00
8 .	Dr.	Fatiha	El-Ghissassi		Co-investigator	(b)(4), (b)(6)				74,863.00	18,791.00	93,654.00
<b>Total Funds Requested for all Senior Key Persons in the attached file</b>											<b>183,736.00</b>	
<b>Additional Senior Key Persons:</b>						File Name: 1234-Straif- EVACRH_2014_2AdditionalSenior-KeyPersons_Y1.pdf		<b>Total Senior/Key Person</b>			<b>462,775.00</b>	

B. Other Personnel							
Number of Personnel*	Project Role*	Calendar Months	Academic Months	Summer Months	Requested Salary (\$)*	Fringe Benefits*	Funds Requested (\$)*
	Post Doctoral Associates						
	Graduate Students						
	Undergraduate Students						
1	Secretarial/Clerical	12.00			0.00	0.00	0.00
1	Technical Officer	4.00			26,710.00	5,898.00	32,608.00
1	Literature specialist	8.00			39,395.00	11,785.00	51,180.00
1	Publication support	8.00			31,630.00	8,303.00	39,933.00
<b>4</b>	<b>Total Number Other Personnel</b>				<b>Total Other Personnel</b>		<b>123,721.00</b>
<b>Total Salary, Wages and Fringe Benefits (A+B)</b>							<b>586,496.00</b>

RESEARCH & RELATED Budget {A-B} (Funds Requested)

## RESEARCH & RELATED BUDGET - SECTION C, D, & E, Budget Period 1

**ORGANIZATIONAL DUNS\*:** 2795518810000

**Budget Type\*:**     Project     Subaward/Consortium

**Organization:** International Agency for Research on Cancer

**Start Date\*:** 09-01-2015

**End Date\*:** 08-31-2016

**Budget Period:** 1

<b>C. Equipment Description</b>		<b>Funds Requested (\$)*</b>
List items and dollar amount for each item exceeding \$5,000		
<b>Equipment Item</b>		_____
<b>Total funds requested for all equipment listed in the attached file</b>		_____
<b>Total Equipment</b>		_____
<b>Additional Equipment:</b> File Name:		

<b>D. Travel</b>		<b>Funds Requested (\$)*</b>
1. Domestic Travel Costs ( Incl. Canada, Mexico, and U.S. Possessions)		
2. Foreign Travel Costs		
<b>Total Travel Cost</b>		_____

<b>E. Participant/Trainee Support Costs</b>		<b>Funds Requested (\$)*</b>
1. Tuition/Fees/Health Insurance		
2. Stipends		
3. Travel		
4. Subsistence		
5. Other:		
<b>Number of Participants/Trainees</b>	<b>Total Participant Trainee Support Costs</b>	_____

RESEARCH & RELATED Budget (C-E) (Funds Requested)

## RESEARCH & RELATED BUDGET - SECTIONS F-K, Budget Period 1

**ORGANIZATIONAL DUNS\*:** 2795518810000

**Budget Type\*:**     Project     Subaward/Consortium

**Organization:** International Agency for Research on Cancer

**Start Date\*:** 09-01-2015

**End Date\*:** 08-31-2016

**Budget Period:** 1

<b>F. Other Direct Costs</b>	<b>Funds Requested (\$)*</b>
1. Materials and Supplies	
2. Publication Costs	10,000.00
3. Consultant Services	
4. ADP/Computer Services	
5. Subawards/Consortium/Contractual Costs	
6. Equipment or Facility Rental/User Fees	
7. Alterations and Renovations	
8. Working Group meetings	158,000.00
9. Literature retrieval	3,000.00
<b>Total Other Direct Costs</b>	<b>171,000.00</b>

<b>G. Direct Costs</b>	<b>Funds Requested (\$)*</b>
<b>Total Direct Costs (A thru F)</b>	<b>757,496.00</b>

<b>H. Indirect Costs</b>			
Indirect Cost Type	Indirect Cost Rate (%)	Indirect Cost Base (\$)	Funds Requested (\$)*
1. Modified Total Direct Costs	13.40	757,496.00	101,504.00
<b>Total Indirect Costs</b>			<b>101,504.00</b>
<b>Cognizant Federal Agency</b>		DHHS, Darryl W. Mayes, (212) 264-1823	
(Agency Name, POC Name, and POC Phone Number)			

<b>I. Total Direct and Indirect Costs</b>	<b>Funds Requested (\$)*</b>
<b>Total Direct and Indirect Institutional Costs (G + H)</b>	<b>859,000.00</b>

<b>J. Fee</b>	<b>Funds Requested (\$)*</b>

<b>K. Budget Justification*</b>
File Name: 1239-Budget_Justification_V2.pdf (Only attach one file.)

RESEARCH & RELATED Budget {F-K} (Funds Requested)

IARC

Principal Investigator/Program Director (Last, first, middle):

Straif, Kurt

DETAILED BUDGET FOR INITIAL BUDGET PERIOD						FROM	THROUGH			
DIRECT COSTS ONLY						09/01/2015	08/31/2016			
PERSONNEL <i>(Applicant organization only)</i>		Months Devoted to Project			DOLLAR AMOUNT REQUESTED <i>(omit cents)</i>					
NAME	ROLE ON PROJECT	Cal. Mnths	Acad. Mnths	Sum. Mnths	INST. BASE SALARY	SALARY REQUESTED	FRINGE BENEFITS	TOTAL	FTE %	Appt Type
Dr. Neela Guha	Co-Investigator	(b)(4), (b)(6)			(b)(4), (b)(6)	65,688.00	16,378.00	82,066.00	(b)(4), (b)(6)	Cal
Dr. Lamia Benbrahim-Tallaa	Co-Investigator					79,185.00	22,485.00	101,670.00		Cal
<b>SUBTOTALS</b>						144,873.00	38,863.00	183,736.00		

## RESEARCH & RELATED BUDGET - SECTION A & B, Budget Period 2

**ORGANIZATIONAL DUNS\*:** 2795518810000

**Budget Type\*:**  Project  Subaward/Consortium

**Enter name of Organization:** International Agency for Research on Cancer

**Start Date\*:** 09-01-2016

**End Date\*:** 08-31-2017

**Budget Period:** 2

A. Senior/Key Person												
Prefix	First Name*	Middle Name	Last Name*	Suffix	Project Role*	Base Salary (\$)	Calendar Months	Academic Months	Summer Months	Requested Salary (\$)*	Fringe Benefits (\$)*	Funds Requested (\$)*
1 .	Dr.	Kurt	Straif		PD/PI	(b)(4), (b)(6)				0.00	0.00	0.00
2 .	Dr.	Dana	Loomis		Co-investigator					0.00	0.00	0.00
3 .	Dr.	Kathryn	Guyton		Co-investigator					0.00	0.00	0.00
4 .	Dr.	Yann	Grosse		Co-investigator					0.00	0.00	0.00
5 .	Dr.	B??atrice	Lauby-Secretan		Co-investigator					0.00	0.00	0.00
6 .	Dr.	Heidi	Mattock		Co-investigator					65,915.00	17,164.00	83,079.00
7 .	Dr.	V??ronique	Bouvard		Co-investigator					80,255.00	22,051.00	102,306.00
8 .	Dr.	Fatiha	El-Ghissassi		Co-investigator					74,863.00	18,791.00	93,654.00
<b>Total Funds Requested for all Senior Key Persons in the attached file</b>											<b>183,736.00</b>	
<b>Additional Senior Key Persons:</b>						File Name: 1235-Straif-EVACRH_2014_2AdditionalSenior-KeyPersons_Y2.pdf					<b>Total Senior/Key Person</b>	<b>462,775.00</b>

B. Other Personnel							
Number of Personnel*	Project Role*	Calendar Months	Academic Months	Summer Months	Requested Salary (\$)*	Fringe Benefits*	Funds Requested (\$)*
	Post Doctoral Associates						
	Graduate Students						
	Undergraduate Students						
1	Secretarial/Clerical	12.00			0.00	0.00	0.00
1	Technical Officer	4.00			26,710.00	5,898.00	32,608.00
1	Literature specialist	8.00			39,395.00	11,785.00	51,180.00
1	Publication support	8.00			31,630.00	8,303.00	39,933.00
<b>4</b>	<b>Total Number Other Personnel</b>					<b>Total Other Personnel</b>	<b>123,721.00</b>
<b>Total Salary, Wages and Fringe Benefits (A+B)</b>							<b>586,496.00</b>

RESEARCH & RELATED Budget {A-B} (Funds Requested)

## RESEARCH & RELATED BUDGET - SECTION C, D, & E, Budget Period 2

**ORGANIZATIONAL DUNS\*:** 2795518810000

**Budget Type\*:**     Project     Subaward/Consortium

**Organization:** International Agency for Research on Cancer

**Start Date\*:** 09-01-2016

**End Date\*:** 08-31-2017

**Budget Period:** 2

<b>C. Equipment Description</b>		<b>Funds Requested (\$)*</b>
List items and dollar amount for each item exceeding \$5,000		
<b>Equipment Item</b>		_____
<b>Total funds requested for all equipment listed in the attached file</b>		_____
		<b>Total Equipment</b>
<b>Additional Equipment:</b> File Name:		

<b>D. Travel</b>		<b>Funds Requested (\$)*</b>
1. Domestic Travel Costs ( Incl. Canada, Mexico, and U.S. Possessions)		
2. Foreign Travel Costs		
		_____
		<b>Total Travel Cost</b>

<b>E. Participant/Trainee Support Costs</b>		<b>Funds Requested (\$)*</b>
1. Tuition/Fees/Health Insurance		
2. Stipends		
3. Travel		
4. Subsistence		
5. Other:		
<b>Number of Participants/Trainees</b>		_____
		<b>Total Participant Trainee Support Costs</b>

RESEARCH & RELATED Budget (C-E) (Funds Requested)

## RESEARCH & RELATED BUDGET - SECTIONS F-K, Budget Period 2

**ORGANIZATIONAL DUNS\*:** 2795518810000

**Budget Type\*:**     Project     Subaward/Consortium

**Organization:** International Agency for Research on Cancer

**Start Date\*:** 09-01-2016

**End Date\*:** 08-31-2017

**Budget Period:** 2

<b>F. Other Direct Costs</b>	<b>Funds Requested (\$)*</b>
1. Materials and Supplies	
2. Publication Costs	10,000.00
3. Consultant Services	
4. ADP/Computer Services	
5. Subawards/Consortium/Contractual Costs	
6. Equipment or Facility Rental/User Fees	
7. Alterations and Renovations	
8. Working Group meetings	158,000.00
9. Literature retrieval	3,000.00
<b>Total Other Direct Costs</b>	<b>171,000.00</b>

<b>G. Direct Costs</b>	<b>Funds Requested (\$)*</b>
<b>Total Direct Costs (A thru F)</b>	<b>757,496.00</b>

<b>H. Indirect Costs</b>			
Indirect Cost Type	Indirect Cost Rate (%)	Indirect Cost Base (\$)	Funds Requested (\$)*
1. Modified Total Direct Costs	13.40	757,496.00	101,504.00
<b>Total Indirect Costs</b>			<b>101,504.00</b>
<b>Cognizant Federal Agency</b>		DHHS, Darryl W. Mayes, (212) 264-1823	
(Agency Name, POC Name, and POC Phone Number)			

<b>I. Total Direct and Indirect Costs</b>	<b>Funds Requested (\$)*</b>
<b>Total Direct and Indirect Institutional Costs (G + H)</b>	<b>859,000.00</b>

<b>J. Fee</b>	<b>Funds Requested (\$)*</b>

<b>K. Budget Justification*</b>
File Name: 1239-Budget_Justification_V2.pdf (Only attach one file.)

RESEARCH & RELATED Budget {F-K} (Funds Requested)

IARC

Principal Investigator/Program Director (Last, first, middle):

Straif, Kurt

DETAILED BUDGET FOR INITIAL BUDGET PERIOD						FROM	THROUGH			
DIRECT COSTS ONLY						09/01/2016	08/31/2017			
PERSONNEL (Applicant organization only)		Months Devoted to Project			DOLLAR AMOUNT REQUESTED (omit cents)					
NAME	ROLE ON PROJECT	Cal. Mnths	Acad. Mnths	Sum. Mnths	INST. BASE SALARY	SALARY REQUESTED	FRINGE BENEFITS	TOTAL	FTE %	Appt Type
Dr. Neela Guha	Co-Investigator	(b)(4), (b)(6)			(b)(4), (b)(6)	65,688.00	16,378.00	82,066.00	(b)(4), (b)(6)	Cal
Dr. Lamia Benbrahim-Tallaa	Co-Investigator					79,185.00	22,485.00	101,670.00		Cal
<b>SUBTOTALS</b>										
						144,873.00	38,863.00	183,736.00		

## RESEARCH & RELATED BUDGET - SECTION A & B, Budget Period 3

**ORGANIZATIONAL DUNS\*:** 2795518810000

**Budget Type\*:**  Project  Subaward/Consortium

**Enter name of Organization:** International Agency for Research on Cancer

**Start Date\*:** 09-01-2017

**End Date\*:** 08-31-2018

**Budget Period:** 3

A. Senior/Key Person												
Prefix	First Name*	Middle Name	Last Name*	Suffix	Project Role*	Base Salary (\$)	Calendar Months	Academic Months	Summer Months	Requested Salary (\$)*	Fringe Benefits (\$)*	Funds Requested (\$)*
1 .	Dr.	Kurt	Straif		PD/PI	(b)(4), (b)(6)				0.00	0.00	0.00
2 .	Dr.	Dana	Loomis		Co-investigator	(b)(4), (b)(6)				0.00	0.00	0.00
3 .	Dr.	Kathryn	Guyton		Co-investigator	(b)(4), (b)(6)				0.00	0.00	0.00
4 .	Dr.	Yann	Grosse		Co-investigator	(b)(4), (b)(6)				0.00	0.00	0.00
5 .	Dr.	B??atrice	Lauby-Secretan		Co-investigator	(b)(4), (b)(6)				0.00	0.00	0.00
6 .	Dr.	Heidi	Mattock		Co-investigator	(b)(4), (b)(6)				65,915.00	17,164.00	83,079.00
7 .	Dr.	V??ronique	Bouvard		Co-investigator	(b)(4), (b)(6)				80,255.00	22,051.00	102,306.00
8 .	Dr.	Fatiha	El-Ghissassi		Co-investigator	(b)(4), (b)(6)				74,863.00	18,791.00	93,654.00
<b>Total Funds Requested for all Senior Key Persons in the attached file</b>											<b>183,736.00</b>	
<b>Additional Senior Key Persons:</b>						File Name: 1236-Straif- EVACRH_2014_2AdditionalSenior-KeyPersons_Y3.pdf					<b>Total Senior/Key Person</b>	<b>462,775.00</b>

B. Other Personnel							
Number of Personnel*	Project Role*	Calendar Months	Academic Months	Summer Months	Requested Salary (\$)*	Fringe Benefits*	Funds Requested (\$)*
	Post Doctoral Associates						
	Graduate Students						
	Undergraduate Students						
1	Secretarial/Clerical	12.00			0.00	0.00	0.00
1	Technical Officer	4.00			26,710.00	5,898.00	32,608.00
1	Literature specialist	8.00			39,395.00	11,785.00	51,180.00
1	Publication support	8.00			31,630.00	8,303.00	39,933.00
<b>4</b>	<b>Total Number Other Personnel</b>					<b>Total Other Personnel</b>	<b>123,721.00</b>
<b>Total Salary, Wages and Fringe Benefits (A+B)</b>							<b>586,496.00</b>

RESEARCH & RELATED Budget {A-B} (Funds Requested)

## RESEARCH & RELATED BUDGET - SECTION C, D, & E, Budget Period 3

**ORGANIZATIONAL DUNS\*:** 2795518810000

**Budget Type\*:**     Project     Subaward/Consortium

**Organization:** International Agency for Research on Cancer

**Start Date\*:** 09-01-2017

**End Date\*:** 08-31-2018

**Budget Period:** 3

<b>C. Equipment Description</b>		<b>Funds Requested (\$)*</b>
List items and dollar amount for each item exceeding \$5,000		
<b>Equipment Item</b>		_____
<b>Total funds requested for all equipment listed in the attached file</b>		_____
		<b>Total Equipment</b>
<b>Additional Equipment:</b> File Name:		

<b>D. Travel</b>		<b>Funds Requested (\$)*</b>
1. Domestic Travel Costs ( Incl. Canada, Mexico, and U.S. Possessions)		
2. Foreign Travel Costs		
		_____
		<b>Total Travel Cost</b>

<b>E. Participant/Trainee Support Costs</b>		<b>Funds Requested (\$)*</b>
1. Tuition/Fees/Health Insurance		
2. Stipends		
3. Travel		
4. Subsistence		
5. Other:		
<b>Number of Participants/Trainees</b>		_____
		<b>Total Participant Trainee Support Costs</b>

RESEARCH & RELATED Budget (C-E) (Funds Requested)

## RESEARCH & RELATED BUDGET - SECTIONS F-K, Budget Period 3

**ORGANIZATIONAL DUNS\*:** 2795518810000

**Budget Type\*:**     Project     Subaward/Consortium

**Organization:** International Agency for Research on Cancer

**Start Date\*:** 09-01-2017

**End Date\*:** 08-31-2018

**Budget Period:** 3

<b>F. Other Direct Costs</b>	<b>Funds Requested (\$)*</b>
1. Materials and Supplies	
2. Publication Costs	10,000.00
3. Consultant Services	
4. ADP/Computer Services	
5. Subawards/Consortium/Contractual Costs	
6. Equipment or Facility Rental/User Fees	
7. Alterations and Renovations	
8. Working Group meetings	158,000.00
9. Literature retrieval	3,000.00
<b>Total Other Direct Costs</b>	<b>171,000.00</b>

<b>G. Direct Costs</b>	<b>Funds Requested (\$)*</b>
<b>Total Direct Costs (A thru F)</b>	<b>757,496.00</b>

<b>H. Indirect Costs</b>			
Indirect Cost Type	Indirect Cost Rate (%)	Indirect Cost Base (\$)	Funds Requested (\$)*
1. Modified Total Direct Costs	13.40	757,496.00	101,504.00
<b>Total Indirect Costs</b>			<b>101,504.00</b>
<b>Cognizant Federal Agency</b>		DHHS, Darryl W. Mayes, (212) 264-1823	
(Agency Name, POC Name, and POC Phone Number)			

<b>I. Total Direct and Indirect Costs</b>	<b>Funds Requested (\$)*</b>
<b>Total Direct and Indirect Institutional Costs (G + H)</b>	<b>859,000.00</b>

<b>J. Fee</b>	<b>Funds Requested (\$)*</b>

<b>K. Budget Justification*</b>
File Name: 1239-Budget_Justification_V2.pdf (Only attach one file.)

RESEARCH & RELATED Budget {F-K} (Funds Requested)

IARC

Principal Investigator/Program Director (Last, first, middle):

Straif, Kurt

DETAILED BUDGET FOR INITIAL BUDGET PERIOD						FROM	THROUGH	
DIRECT COSTS ONLY						09/01/2017	08/31/2018	
PERSONNEL <i>(Applicant organization only)</i>		Months Devoted to Project			DOLLAR AMOUNT REQUESTED <i>(omit cents)</i>			
NAME	ROLE ON PROJECT	Cal. Mnths	Acad. Mnths	Sum. Mnths	INST. BASE SALARY	SALARY REQUESTED	FRINGE BENEFITS	TOTAL
Dr. Neela Guha	Co-Investigator	(b)(4), (b)(6)			(b)(4), (b)(6)	65,688.00	16,378.00	82,066.00
Dr. Lamia Benbrahim-Tallaa	Co-Investigator					79,185.00	22,485.00	101,670.00
<b>SUBTOTALS</b>						144,873.00	38,863.00	183,736.00

FTE %	Appt Type
(b)(4), (b)(6)	Cal
	Cal

## RESEARCH & RELATED BUDGET - SECTION A & B, Budget Period 4

**ORGANIZATIONAL DUNS\*:** 2795518810000

**Budget Type\*:**  Project  Subaward/Consortium

**Enter name of Organization:** International Agency for Research on Cancer

**Start Date\*:** 09-01-2018

**End Date\*:** 08-31-2019

**Budget Period:** 4

A. Senior/Key Person												
Prefix	First Name*	Middle Name	Last Name*	Suffix	Project Role*	Base Salary (\$)	Calendar Months	Academic Months	Summer Months	Requested Salary (\$)*	Fringe Benefits (\$)*	Funds Requested (\$)*
1 .	Dr.	Kurt	Straif		PD/PI	(b)(4), (b)(6)				0.00	0.00	0.00
2 .	Dr.	Dana	Loomis		Co-investigator	(b)(4), (b)(6)				0.00	0.00	0.00
3 .	Dr.	Kathryn	Guyton		Co-investigator	(b)(4), (b)(6)				0.00	0.00	0.00
4 .	Dr.	Yann	Grosse		Co-investigator	(b)(4), (b)(6)				0.00	0.00	0.00
5 .	Dr.	B??atrice	Lauby-Secretan		Co-investigator	(b)(4), (b)(6)				0.00	0.00	0.00
6 .	Dr.	Heidi	Mattock		Co-investigator	(b)(4), (b)(6)				65,915.00	17,164.00	83,079.00
7 .	Dr.	V??ronique	Bouvard		Co-investigator	(b)(4), (b)(6)				80,255.00	22,051.00	102,306.00
8 .	Dr.	Fatiha	El-Ghissassi		Co-investigator	(b)(4), (b)(6)				74,863.00	18,791.00	93,654.00
<b>Total Funds Requested for all Senior Key Persons in the attached file</b>											<b>183,736.00</b>	
<b>Additional Senior Key Persons:</b>						File Name: 1237-Straif- EVACRH_2014_2AdditionalSenior-KeyPersons_Y4.pdf		<b>Total Senior/Key Person</b>			<b>462,775.00</b>	

B. Other Personnel							
Number of Personnel*	Project Role*	Calendar Months	Academic Months	Summer Months	Requested Salary (\$)*	Fringe Benefits*	Funds Requested (\$)*
	Post Doctoral Associates						
	Graduate Students						
	Undergraduate Students						
1	Secretarial/Clerical	12.00			0.00	0.00	0.00
1	Technical Officer	4.00			26,710.00	5,898.00	32,608.00
1	Literature specialist	8.00			39,395.00	11,785.00	51,180.00
1	Publication support	8.00			31,630.00	8,303.00	39,933.00
<b>4</b>	<b>Total Number Other Personnel</b>					<b>Total Other Personnel</b>	<b>123,721.00</b>
<b>Total Salary, Wages and Fringe Benefits (A+B)</b>							<b>586,496.00</b>

RESEARCH & RELATED Budget {A-B} (Funds Requested)

## RESEARCH & RELATED BUDGET - SECTION C, D, & E, Budget Period 4

**ORGANIZATIONAL DUNS\*:** 2795518810000

**Budget Type\*:**     Project     Subaward/Consortium

**Organization:** International Agency for Research on Cancer

**Start Date\*:** 09-01-2018

**End Date\*:** 08-31-2019

**Budget Period:** 4

<b>C. Equipment Description</b>		<b>Funds Requested (\$)*</b>
List items and dollar amount for each item exceeding \$5,000		
<b>Equipment Item</b>		_____
<b>Total funds requested for all equipment listed in the attached file</b>		_____
<b>Total Equipment</b>		_____
<b>Additional Equipment:</b> File Name: _____		

<b>D. Travel</b>	<b>Funds Requested (\$)*</b>
1. Domestic Travel Costs ( Incl. Canada, Mexico, and U.S. Possessions)	_____
2. Foreign Travel Costs	_____
<b>Total Travel Cost</b>	_____

<b>E. Participant/Trainee Support Costs</b>	<b>Funds Requested (\$)*</b>
1. Tuition/Fees/Health Insurance	_____
2. Stipends	_____
3. Travel	_____
4. Subsistence	_____
5. Other:	_____
<b>Number of Participants/Trainees</b>	<b>Total Participant Trainee Support Costs</b>
	_____

RESEARCH & RELATED Budget (C-E) (Funds Requested)

## RESEARCH & RELATED BUDGET - SECTIONS F-K, Budget Period 4

**ORGANIZATIONAL DUNS\*:** 2795518810000

**Budget Type\*:**     Project     Subaward/Consortium

**Organization:** International Agency for Research on Cancer

**Start Date\*:** 09-01-2018

**End Date\*:** 08-31-2019

**Budget Period:** 4

<b>F. Other Direct Costs</b>	<b>Funds Requested (\$)*</b>
1. Materials and Supplies	
2. Publication Costs	10,000.00
3. Consultant Services	
4. ADP/Computer Services	
5. Subawards/Consortium/Contractual Costs	
6. Equipment or Facility Rental/User Fees	
7. Alterations and Renovations	
8. Working Group meetings	158,000.00
9. Literature retrieval	3,000.00
<b>Total Other Direct Costs</b>	<b>171,000.00</b>

<b>G. Direct Costs</b>	<b>Funds Requested (\$)*</b>
<b>Total Direct Costs (A thru F)</b>	<b>757,496.00</b>

<b>H. Indirect Costs</b>			
Indirect Cost Type	Indirect Cost Rate (%)	Indirect Cost Base (\$)	Funds Requested (\$)*
1. Modified Total Direct Costs	13.40	757,496.00	101,504.00
<b>Total Indirect Costs</b>			<b>101,504.00</b>
<b>Cognizant Federal Agency</b>		DHHS, Darryl W. Mayes, (212) 264-1823	
(Agency Name, POC Name, and POC Phone Number)			

<b>I. Total Direct and Indirect Costs</b>	<b>Funds Requested (\$)*</b>
<b>Total Direct and Indirect Institutional Costs (G + H)</b>	<b>859,000.00</b>

<b>J. Fee</b>	<b>Funds Requested (\$)*</b>

<b>K. Budget Justification*</b>
File Name: 1239-Budget_Justification_V2.pdf (Only attach one file.)

RESEARCH & RELATED Budget {F-K} (Funds Requested)

IARC

Principal Investigator/Program Director (Last, first, middle):

Straif, Kurt

DETAILED BUDGET FOR INITIAL BUDGET PERIOD						FROM	THROUGH				
DIRECT COSTS ONLY						09/01/2018	08/31/2019				
PERSONNEL <i>(Applicant organization only)</i>		Months Devoted to Project			DOLLAR AMOUNT REQUESTED <i>(omit cents)</i>						
NAME	ROLE ON PROJECT	Cal. Mnths	Acad. Mnths	Sum. Mnths	INST. BASE SALARY	SALARY REQUESTED	FRINGE BENEFITS	TOTAL	FTE %	Appt Type	
Dr. Neela Guha	Co-Investigator	(b)(4), (b)(6)			(b)(4), (b)(6)	65,688.00	16,378.00	82,066.00	(b)(4), (b)(6)	Cal	
Dr. Lamia Benbrahim-Tallaa	Co-Investigator					79,185.00	22,485.00	101,670.00		Cal	
<b>SUBTOTALS</b>						144,873.00	38,863.00	183,736.00			

## RESEARCH & RELATED BUDGET - SECTION A & B, Budget Period 5

**ORGANIZATIONAL DUNS\*:** 2795518810000

**Budget Type\*:**  Project  Subaward/Consortium

**Enter name of Organization:** International Agency for Research on Cancer

**Start Date\*:** 09-01-2019

**End Date\*:** 08-31-2020

**Budget Period:** 5

A. Senior/Key Person												
Prefix	First Name*	Middle Name	Last Name*	Suffix	Project Role*	Base Salary (\$)	Calendar Months	Academic Months	Summer Months	Requested Salary (\$)*	Fringe Benefits (\$)*	Funds Requested (\$)*
1 .	Dr.	Kurt	Straif		PD/PI	(b)(4), (b)(6)				0.00	0.00	0.00
2 .	Dr.	Dana	Loomis		Co-investigator					0.00	0.00	0.00
3 .	Dr.	Kathryn	Guyton		Co-investigator					0.00	0.00	0.00
4 .	Dr.	Yann	Grosse		Co-investigator					0.00	0.00	0.00
5 .	Dr.	B??atrice	Lauby-Secretan		Co-investigator					0.00	0.00	0.00
6 .	Dr.	Heidi	Mattock		Co-investigator					65,915.00	17,164.00	83,079.00
7 .	Dr.	V??ronique	Bouvard		Co-investigator					80,255.00	22,051.00	102,306.00
8 .	Dr.	Fatiha	El-Ghissassi		Co-investigator					74,863.00	18,791.00	93,654.00
<b>Total Funds Requested for all Senior Key Persons in the attached file</b>											<b>183,736.00</b>	
<b>Additional Senior Key Persons:</b> File Name: 1238-Straif-EVACRH_2014_2AdditionalSenior-KeyPersons_Y5.pdf											<b>Total Senior/Key Person</b>	<b>462,775.00</b>

B. Other Personnel							
Number of Personnel*	Project Role*	Calendar Months	Academic Months	Summer Months	Requested Salary (\$)*	Fringe Benefits*	Funds Requested (\$)*
	Post Doctoral Associates						
	Graduate Students						
	Undergraduate Students						
1	Secretarial/Clerical	12.00			0.00	0.00	0.00
1	Technical Officer	4.00			26,710.00	5,898.00	32,608.00
1	Literature specialist	8.00			39,395.00	11,785.00	51,180.00
1	Publication support	8.00			31,630.00	8,303.00	39,933.00
<b>4</b>	<b>Total Number Other Personnel</b>					<b>Total Other Personnel</b>	<b>123,721.00</b>
<b>Total Salary, Wages and Fringe Benefits (A+B)</b>							<b>586,496.00</b>

RESEARCH & RELATED Budget {A-B} (Funds Requested)

## RESEARCH & RELATED BUDGET - SECTION C, D, & E, Budget Period 5

**ORGANIZATIONAL DUNS\*:** 2795518810000

**Budget Type\*:**     Project     Subaward/Consortium

**Organization:** International Agency for Research on Cancer

**Start Date\*:** 09-01-2019

**End Date\*:** 08-31-2020

**Budget Period:** 5

<b>C. Equipment Description</b>	<b>Funds Requested (\$)*</b>
List items and dollar amount for each item exceeding \$5,000	
<b>Equipment Item</b>	
<b>Total funds requested for all equipment listed in the attached file</b>	
	<b>Total Equipment</b>
<b>Additional Equipment:</b> File Name:	

<b>D. Travel</b>	<b>Funds Requested (\$)*</b>
1. Domestic Travel Costs ( Incl. Canada, Mexico, and U.S. Possessions)	
2. Foreign Travel Costs	
	<b>Total Travel Cost</b>

<b>E. Participant/Trainee Support Costs</b>	<b>Funds Requested (\$)*</b>
1. Tuition/Fees/Health Insurance	
2. Stipends	
3. Travel	
4. Subsistence	
5. Other:	
<b>Number of Participants/Trainees</b>	<b>Total Participant Trainee Support Costs</b>

RESEARCH & RELATED Budget (C-E) (Funds Requested)

**RESEARCH & RELATED BUDGET - SECTIONS F-K, Budget Period 5****ORGANIZATIONAL DUNS\*:** 2795518810000**Budget Type\*:**  Project  Subaward/Consortium**Organization:** International Agency for Research on Cancer**Start Date\*:** 09-01-2019**End Date\*:** 08-31-2020**Budget Period:** 5

<b>F. Other Direct Costs</b>	<b>Funds Requested (\$)*</b>
1. Materials and Supplies	
2. Publication Costs	10,000.00
3. Consultant Services	
4. ADP/Computer Services	
5. Subawards/Consortium/Contractual Costs	
6. Equipment or Facility Rental/User Fees	
7. Alterations and Renovations	
8. Working Group meetings	158,000.00
9. Literature retrieval	3,000.00
<b>Total Other Direct Costs</b>	<b>171,000.00</b>

<b>G. Direct Costs</b>	<b>Funds Requested (\$)*</b>
<b>Total Direct Costs (A thru F)</b>	<b>757,496.00</b>

<b>H. Indirect Costs</b>			
<b>Indirect Cost Type</b>	<b>Indirect Cost Rate (%)</b>	<b>Indirect Cost Base (\$)</b>	<b>Funds Requested (\$)*</b>
1. Modified Total Direct Costs	13.40	757,496.00	101,504.00
<b>Total Indirect Costs</b>			<b>101,504.00</b>
<b>Cognizant Federal Agency</b>		DHHS, Darryl W. Mayes, (212) 264-1823	
(Agency Name, POC Name, and POC Phone Number)			

<b>I. Total Direct and Indirect Costs</b>	<b>Funds Requested (\$)*</b>
<b>Total Direct and Indirect Institutional Costs (G + H)</b>	<b>859,000.00</b>

<b>J. Fee</b>	<b>Funds Requested (\$)*</b>

<b>K. Budget Justification*</b>
File Name: 1239-Budget_Justification_V2.pdf (Only attach one file.)

RESEARCH &amp; RELATED Budget {F-K} (Funds Requested)

IARC

Principal Investigator/Program Director (Last, first, middle):

Straif, Kurt

<b>DETAILED BUDGET FOR INITIAL BUDGET PERIOD</b>						FROM	THROUGH			
<b>DIRECT COSTS ONLY</b>						09/01/2019	08/31/2020			
PERSONNEL <i>(Applicant organization only)</i>		Months Devoted to Project			DOLLAR AMOUNT REQUESTED <i>(omit cents)</i>					
NAME	ROLE ON PROJECT	Cal. Mnths	Acad. Mnths	Sum. Mnths	INST. BASE SALARY	SALARY REQUESTED	FRINGE BENEFITS	TOTAL	FTE %	Appt Type
Dr. Neela Guha	Co-Investigator	(b)(4), (b)(6)			(b)(4), (b)(6)	65,688.00	16,378.00	82,066.00	(b)(4), (b)(6)	Cal
Dr. Lamia Benbrahim-Tallaa	Co-Investigator					79,185.00	22,485.00	101,670.00		Cal
<b>SUBTOTALS</b>						144,873.00	38,863.00	183,736.00		

## Budget Justification

### Personnel

K. Straif, PD/PI ((b)(4), (b)(6) months per year) is the Head of the IARC Monographs programme. He will be overall responsible for the prioritisation of agents for evaluation, development of Monographs and management of the Programme. His salary is fully covered by the IARC regular budget.

D. Loomis, co-investigator ((b)(4), (b)(6) months per year) is the Deputy Head and Senior Epidemiologist of the IARC Monographs programme. He works closely with the Head of the Programme and oversees for all Monographs the sections on exposure and cancer in humans. He serves as Responsible Officer, on average for 1 out of 4 meetings, and for all Monographs as rapporteur of the section on cancer in humans. His salary is fully covered by the IARC regular budget.

K. Guyton, co-investigator ((b)(4), (b)(6) months per year) is the Senior Toxicologist of the IARC Monographs programme. She works closely with the Head of the Programme and oversees for all Monographs the sections on cancer bioassays and mechanisms of carcinogenesis. She serves as Responsible Officer, on average for 1 out of 4 meetings, and for all Monographs as rapporteur of the section on mechanisms of carcinogenesis. Her salary is fully covered by the IARC regular budget.

Y Grosse, co-investigator ((b)(4), (b)(6) per year) is the expert on cancer bioassays and works closely with the Senior Toxicologist. He serves as Responsible Officer, on average for 1 out of 4 meetings, and for all Monographs as rapporteur of the section on cancer bioassays. His salary is fully covered by the IARC regular budget.

B. Lauby-Secretan, co-investigator ((b)(4), (b)(6) months per year) is the expert on exposure and works closely with the Senior Epidemiologist. She serves as Responsible Officer, on average for 1 out of 4 meetings, and for all Monographs as rapporteur of the section on exposure. Her salary is fully covered by the IARC regular budget.

H. Mattock, co-investigator ((b)(4), (b) months per year) is the Editor of the Programme. She is responsible for overseeing the literature retrieval (together with the Responsible Officer), the pre- and post-meeting document handling and final editing of the Monographs.

V. Bouvard, co-investigator ((b)(4), (b) months per year) is co-rapporteur in the section on exposure and reviews the scientific accuracy of this section.

F. El Ghissassi, co-investigator ((b)(4), (b)(6) months per year) is co-rapporteur in the section on mechanisms of carcinogenesis and reviews the scientific accuracy of this section.

N. Guha, co-investigator ((b)(4), (b) months per year) is co-rapporteur in the section on cancer in humans and reviews the scientific accuracy of this section.

L. Benbrahim-Tallaa, co-investigator ((b)(4), (b)(6) months per year) is co-rapporteur in the section on cancer bioassays and reviews the scientific accuracy of this section.

C. Scocianti, Technical Officer ((b)(4), (b)(6) months per year) supports the rapporteurs and co-rapporteurs with the verification of the scientific accuracy of the Monographs.

S. Egraz, literature specialist ((b)(4), (b)(6) months per year) is the principal archivist. She supervises literature searches and maintains the computerized archival of documents cited by the *Monographs*.

S. Quennehen, publication support (b)(4), (b) months per year) is pre- and post-meeting responsible for preparation of working documents and final *Monographs* for printing, as well as for maintenance of the *Monographs* programme website.

H. Lorenzen-Augros, Secretary (b)(4), (b)(6) months per year) is the assistant of the Monographs section. She supports the PI and co-investigators with the management of the Programme and the preparation of the Monograph meetings. Her salary is fully covered by the IARC regular budget.

### **Other Expenses**

Funds are requested to support

- 2 Working Group meetings per year, including travel cost and per diem for non-US Govt. participants (no honorarium will be paid to experts for the preparation of draft working papers): \$158.000/year.
- Literature retrieval (books, journals, reprints and reproduction costs): \$3.000/year.
- Printing costs of 2 Monographs per year: \$10.000/year.

### **Indirect Costs**

The F&A costs are corresponding to 13.4% of modified total direct costs throughout all 5 years (based on 2015 provisional rate from Nonprofit Rate Agreement dated 11/20/2013).

## RESEARCH & RELATED BUDGET - Cumulative Budget

	Totals (\$)	
<b>Section A, Senior/Key Person</b>		<b>2,313,875.00</b>
<b>Section B, Other Personnel</b>		<b>618,605.00</b>
Total Number Other Personnel	20	
<b>Total Salary, Wages and Fringe Benefits (A+B)</b>		<b>2,932,480.00</b>
<b>Section C, Equipment</b>		
<b>Section D, Travel</b>		
1. Domestic		
2. Foreign		
<b>Section E, Participant/Trainee Support Costs</b>		
1. Tuition/Fees/Health Insurance		
2. Stipends		
3. Travel		
4. Subsistence		
5. Other		
6. Number of Participants/Trainees		
<b>Section F, Other Direct Costs</b>		<b>855,000.00</b>
1. Materials and Supplies		
2. Publication Costs	50,000.00	
3. Consultant Services		
4. ADP/Computer Services		
5. Subawards/Consortium/Contractual Costs		
6. Equipment or Facility Rental/User Fees		
7. Alterations and Renovations		
8. Other 1	790,000.00	
9. Other 2	15,000.00	
10. Other 3		
<b>Section G, Direct Costs (A thru F)</b>		<b>3,787,480.00</b>
<b>Section H, Indirect Costs</b>		<b>507,520.00</b>
<b>Section I, Total Direct and Indirect Costs (G + H)</b>		<b>4,295,000.00</b>
<b>Section J, Fee</b>		

## PHS 398 Cover Page Supplement

OMB Number: 0925-0001

### 1. Project Director / Principal Investigator (PD/PI)

Prefix: Dr.  
 First Name\*: Kurt  
 Middle Name:  
 Last Name\*: Straif  
 Suffix:

### 2. Human Subjects

Clinical Trial?  No  Yes  
 Agency-Defined Phase III Clinical Trial?\*  No  Yes

### 3. Permission Statement\*

If this application does not result in an award, is the Government permitted to disclose the title of your proposed project, and the name, address, telephone number and e-mail address of the official signing for the applicant organization, to organizations that may be interested in contacting you for further information (e.g., possible collaborations, investment)?

Yes  No

### 4. Program Income\*

Is program income anticipated during the periods for which the grant support is requested?  Yes  No

If you checked "yes" above (indicating that program income is anticipated), then use the format below to reflect the amount and source(s). Otherwise, leave this section blank.

Budget Period*	Anticipated Amount (\$)*	Source(s)*
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

## PHS 398 Cover Page Supplement

### 5. Human Embryonic Stem Cells

Does the proposed project involve human embryonic stem cells?\*  No  Yes

If the proposed project involves human embryonic stem cells, list below the registration number of the specific cell line(s) from the following list: [http://grants.nih.gov/stem\\_cells/registry/current.htm](http://grants.nih.gov/stem_cells/registry/current.htm). Or, if a specific stem cell line cannot be referenced at this time, please check the box indicating that one from the registry will be used:

**Cell Line(s):**  Specific stem cell line cannot be referenced at this time. One from the registry will be used.

### 6. Inventions and Patents (For renewal applications only)

Inventions and Patents\*:  Yes  No

If the answer is "Yes" then please answer the following:

Previously Reported\*:  Yes  No

### 7. Change of Investigator / Change of Institution Questions

Change of principal investigator / program director

Name of former principal investigator / program director:

Prefix:

First Name\*:

Middle Name:

Last Name\*:

Suffix:

Change of Grantee Institution

Name of former institution\*:

**PHS 398 Research Plan**

Please attach applicable sections of the research plan, below.

OMB Number: 0925-0001

**1. Introduction to Application**

(for RESUBMISSION or REVISION only)

**2. Specific Aims**

1259-Specific Aims.pdf

**3. Research Strategy\***

1260-Research\_Strategy.pdf

**4. Progress Report Publication List**

1261-Progress\_Report\_Publication\_List.pdf

**Human Subjects Sections****5. Protection of Human Subjects**

1262-Protection of Human Subjects.pdf

**6. Inclusion of Women and Minorities**

1263-Inclusion of Women and Minorities.pdf

**7. Inclusion of Children**

1264-Inclusion of Children.pdf

**Other Research Plan Sections****8. Vertebrate Animals****9. Select Agent Research****10. Multiple PD/PI Leadership Plan****11. Consortium/Contractual Arrangements****12. Letters of Support****13. Resource Sharing Plan(s)****Appendix (if applicable)****14. Appendix**

## Specific Aims

This application is for renewal of funding for the *IARC Monographs Programme*, which has received support from the NCI since 1982 through a cooperative agreement. **The overall goal of the Programme is to identify preventable causes of cancer.** This goal is advanced by: conducting authoritative, internationally-respected evaluations of suspected carcinogens, encompassing environmental and occupational exposures, physical and biological agents, chemicals, complex mixtures and lifestyle factors, by expert working groups; and by disseminating the results in *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans* (the Monographs) and through other media.

The IARC Monographs are uniquely authoritative in that they represent the consensus, based on systematic review and weight-of-the-evidence evaluation, of working groups of international experts who conducted the original research. Strong measures to ensure freedom from conflicts of interest and interference by special interests ensure that the Monographs are trustworthy.

The Monographs have high worldwide impact: carcinogen evaluation activities in many high-income countries incorporate data and methods from the Monographs, while in low- and middle-income countries, which often do not have the capacity to develop independent evaluations, the Monographs may be the primary source of information about carcinogens.

During the 5-year proposed project period, we will build on the achievements of the current period with the following aims:

- **Organize at least 10 Monograph meetings to evaluate candidate carcinogenic agents of high global relevance and concern.** Priorities for evaluation will be identified through an extensive, public priority-setting process and considerations of the extent of human exposure, public health relevance, public concern and availability of existing or emergent data.
- **Convene Working Groups that are scientifically rigorous, respected, and free of conflict of interest.** We will build on more than 40 years of internationally-recognized experience and a clear set of procedural guidelines to ensure that evaluations are conducted by Working Groups that are respected for scientific expertise and free from vested interest.
- **Enhance the systematic search, evaluation and documentation of scientific data for carcinogen evaluations.** We will introduce new working procedures and Web-based tools to enhance the documentation of the search for and evaluation of relevant literature on cancer in humans, cancer in experimental animals, and relevant mechanisms of carcinogenesis.
- **Advance the use of mechanistic data in carcinogen evaluations.** The spectrum of mechanistic data considered in making evaluations will be expanded to include novel data streams, including high-throughput test results, and the review of mechanistic data will be further systematized according to key characteristics of carcinogens to facilitate broader inclusion of important studies from the cancer research community.
- **Promote wide dissemination of evaluation results.** We will disseminate evaluation results widely, expanding the use of digital technology, including a range of electronic publications, a searchable database and social networks, while maintaining use of traditional print and news media outlets.
- **Engage in collaborations with national and international organizations to improve the science and practice of evaluating potential carcinogens.** We will collaborate with other agencies that conduct health assessments, including the US National Toxicology Program, the US EPA, and the World Health Organization, to enhance the scientific rigor of carcinogen evaluations and to develop new tools to improve transparency and efficiency.

Successful completion of the project aims will provide governments and health agencies worldwide with timely, trustworthy, authoritative scientific information to support actions to prevent cancer through control of exposure to known, probable, and possible carcinogens. Additionally, the project will develop methodologies to prepare for future evaluations of newly introduced chemicals, including those for which mechanistic data provide the primary evidence of carcinogenicity.

## A. Overview

**Background.** Through the Monographs Programme (the Programme), IARC seeks to identify the causes of human cancer (Cogliano et al., 2011). This critical first step in cancer prevention remains as important today as when IARC was established in 1965. The global burden of cancer is high and continues to increase: the annual number of new cases was estimated at 14.1 million in 2012 and is expected to reach 21.7 million by 2030 (Ferlay et al., 2012). With current trends in demographics and exposure, the cancer burden is shifting from high-income countries to low- and middle-income countries. As a result of Monographs evaluations, national health agencies are able, on scientific grounds, to take measures to reduce human exposure to carcinogens in the workplace and in the environment.

Soon after IARC was established, it began to receive requests for lists of known and suspected carcinogens. In 1970, the IARC Governing Council adopted a resolution concerning IARC's role in providing authorities with expert, independent, scientific evaluation on environmental carcinogens, and "Monographs on the evaluation of carcinogenic risk of chemicals to man" became the initial title of the series. In the succeeding years, the scope of the Monographs broadened as evaluations were developed for groups of related chemicals, complex mixtures, physical agents, biological agents, occupational exposures, and lifestyle factors. The Monographs are unique in that they are developed by experts who conducted the original research.

The IARC Monographs are published as a series of volumes. Generally, three volumes are developed every year. Each volume contains one or more Monographs, which can cover either a single agent or a group of related agents. Each Monograph contains a critical review of the openly available scientific literature, followed by an evaluation of the weight of the evidence that the agent can cause cancer. Over time, the structure of a Monograph has evolved to include the following sections: 1) Exposure data, 2) Studies of cancer in humans, 3) Studies of cancer in experimental animals, 4) Mechanistic and other relevant data, 5) Summary of sections 1-4, 6) Evaluation and rationale. Each Monograph undergoes rigorous fact checking prior to publication.

The Preamble to the IARC Monographs (IARC 2006) opens each volume. The Preamble describes the objective and scope of the Monographs, the scientific principles and procedures used in developing a Monograph, the types of evidence considered, and the scientific criteria that guide the evaluations. The Preamble both promotes consistency of evaluations and specifies strong measures to avoid conflicts of interest and interference by special interests. Clearly defined roles and responsibilities of the different types of participants assure that the principles of securing the best possible scientific subject-matter expertise with freedom from conflict of interest are upheld.

IARC convenes Advisory Groups every 5 years to ensure that the topics of new Monographs reflect current research and public health priorities. These Advisory Groups comprise senior officials from national and international health agencies (who contribute information about carcinogens for which new evaluations would be useful) and senior scientists from cancer research institutes and academic organizations (who contribute information about cancer research in progress and anticipated publication dates). These Advisory Groups evaluate nominations solicited from individuals and organisations worldwide, recommending agents for first time evaluation or for re-evaluation based on availability of significant new data. Thus the evaluation process is dynamic and reflects both new scientific results and emerging scientific understanding.

The Programme also organizes workshops on critical scientific issues pertinent to the identification of carcinogens. Like Monograph meetings, workshops bring together international, interdisciplinary Working Groups of expert scientists to determine whether scientific knowledge has accumulated to develop a consensus in a particular area.

Since 1982, NCI has supported the IARC Monographs through a cooperative agreement that provides funding for two of the three volumes of Monographs that are developed every year. NCI scientists participate in this cooperative agreement in several ways: (1) NCI makes suggestions on the agents to be evaluated, (2) NCI provides information relevant to the carcinogenicity of chemicals tested in US laboratories, (3) the NCI Program Director participates in meetings convened by the Monographs programme as a Representative (NCI

funds are not used to pay for travel expenses of US government employees). Although not supported by NCI, scientific workshops are included for the sake of completeness in describing the overall programme.

**Significance.** Widely known as WHO's "Encyclopaedia of Carcinogens," the IARC Monographs have reviewed nearly 1000 agents and have identified 114 agents *carcinogenic to humans* (Group 1), 69 agents *probably carcinogenic to humans* (Group 2A), and 283 agents *possibly carcinogenic to humans* (Group 2B).

Many national and international health agencies worldwide use the IARC Monographs as the scientific basis for actions to prevent exposure to known, probable, and possible carcinogens. In the United States and other high-income countries, national agencies make frequent reference to the IARC Monographs. In developing countries, the IARC Monographs provide information about carcinogens to countries whose health ministries lack resources or experience in evaluating cancer hazards. Several Monographs completed during the most recent project period have addressed cancer hazards that disproportionately affect developing countries, for example, malaria (caused by infection with *Plasmodium falciparum* in holoendemic areas) and outdoor air pollution. In addition, as developing countries become more industrialized, exposure to some hazardous chemicals evaluated by the Monographs has increased, especially if workplace or environmental standards are inadequate or are not enforced.

The principles used by the IARC Monographs to evaluate the weight of evidence have influenced those of other carcinogen identification programs. For example,

- The 1986 cancer guidelines of the US Environmental Protection Agency (EPA) adopted IARC's definitions of *sufficient evidence*, *limited evidence*, and *inadequate evidence* found in the Monographs Preamble, and EPA's 2005 revised cancer guidelines followed IARC's lead in allowing strong mechanistic evidence to contribute to the characterization of an agent as *carcinogenic to humans*.
- Two recent reports of the US National Research Council (NRC) have recommended the Monographs systematic review and evaluation methodology as a model for the US EPA Integrated Risk Information System (IRIS) program (NRC, 2011, 2014). NRC (2011) highlighted the Monographs as an example systematic approach to hazard identification, noting that it has the essential elements of "systematic gathering and review of all lines of evidence and classification of the strength of evidence in a uniform and hierarchic structure".
- The *Report on Carcinogens* published by the US National Toxicology Program (NTP) makes similar use of strong mechanistic evidence in exposed humans to characterize an agent as "known to be a human carcinogen."
- In 2013, the US NIOSH has proposed an update of their Carcinogen Classification. It is suggested that the derivation of risk-based Recommended Exposure Limits will be considered for carcinogenic agents identified by IARC, NTP, or EPA.
- The Globally Harmonized System of Classification and Labelling of Chemicals, developed through the United Nations and the OECD, has incorporated elements from IARC's classification process, most notably IARC's definitions of *sufficient evidence* and *limited evidence* in humans and in experimental animals.
- The International Chemical Safety Cards (ICSC) are developed and updated during peer review meetings organized by WHO and ILO. For the carcinogenicity designation of chemicals the IARC classification is adopted.

Although there are several authoritative carcinogen identification programs in the United States, they do not replace the IARC Monographs. IARC has identified more known, probable, and possible carcinogens than the NTP *Report on Carcinogens*, the US Environmental Protection Agency, and the California Environmental Protection Agency. IARC evaluations often precede those of other health agencies and are often cited in new listings by such agencies. For example, all of the 9 candidate substances currently under consideration for the 14th Edition of the *Report on Carcinogens* have been previously evaluated by IARC.

Further, IARC Monographs evaluations are generally confirmed when national or international health agencies consider agents previously evaluated by IARC. For example, the current 13th Edition of the *Report on*

*Carcinogens* (NTP 2014) lists one new agent as “known to be a human carcinogen”, which had been classified earlier by IARC as *carcinogenic to humans*. Three new agents were listed as “reasonably anticipated to be human carcinogens”; two of which had been previously classified by IARC as *possibly carcinogenic to humans*. The fourth new listing is based on a new NTP bioassay published in 2011; this agent has since been nominated for Monograph evaluation, and identified as “high priority” by the IARC Advisory Group on Priorities (IARC, 2014). None of the 9 agents newly classified by IARC as *carcinogenic to humans* during the current funding period (see Progress Report) has yet been classified by the Report on Carcinogens as “known to be human carcinogen,” although some of them (e.g. diesel engine exhaust and outdoor air pollution) have major public health consequences.

The international character of the IARC Monographs is unique. The Monographs are a worldwide endeavour that since 1971 has involved more than 1200 scientists from over 50 countries. During the current funding period, 186 individual scientists from 131 institutions in 32 countries participated in Monographs Working Groups. For the first time ever, experts from Kenya and Nicaragua participated on Monographs Working Groups. Moreover, IARC is the specialized cancer agency of the World Health Organization (WHO), giving the Agency a strategic position within the United Nations. This status not only accords IARC a level of independence beyond that of most national agencies, but elevates the impact of its work and facilitates the translation of Monograph findings to public health recommendations, guidelines and policy worldwide.

### **B. Progress Report (project period Sept 2010 to Aug 2015)**

The last competitive review of this project occurred during 2009. The current cooperative agreement covers the period from September 2010 through August 2015, and during the 4 years of this 5-year project period that have elapsed, IARC:

- Convened meetings to develop 11 new Monograph volumes covering 87 agents (Volumes 101-111); and prepared meetings to develop 2 more Monograph volumes (Volumes 112 and 113);
- Convened two Advisory Groups and two scientific workshops pertinent to the Monographs programme;
- Solicited public participation in the Monographs process;
- Increased public availability of Monographs results and dissemination;
- Increased efficiency and quality of Monograph production and distribution.

### **Development of new IARC Monographs**

During the current project period, eleven volumes of IARC Monographs have been developed (Volumes 101-111), and preparations have been made for the next two volumes (Volume 112 and 113). Agents that have been or will be considered at these meetings span the full diversity of carcinogenic agents including chemical agents, complex mixtures, physical agents, biological agents, occupational exposures, pharmaceuticals and herbal remedies. Among the agents selected for review are some with notably large or complex databases (e.g. diesel engine exhaust, polychlorinated biphenyls), many with widespread human exposures (e.g., common pharmaceuticals and herbal remedies such as digoxin and aloe vera, radiofrequency electromagnetic fields, polychlorinated biphenyls, and DDT) and some of particular concern in low- and middle-income countries (e.g., outdoor air pollution and infections such as malaria).

Among the **87** agents reviewed during September 2010-2014, **51** had never before been reviewed by IARC and **20** others received higher classifications than in the previous IARC review. Moreover, **9** agents were newly classified as *carcinogenic to humans* (Group 1): Acheson process; 1,2-dichloropropane; diesel engine exhaust; fluoro-edenite fibrous amphibole; outdoor air pollution; particulate matter in outdoor air pollution; polychlorinated biphenyls; dioxin-like polychlorinated biphenyls, and trichloroethylene. The continuing identification of new Group 1 agents highlights that important causes of human cancer remain to be recognized.

In addition, **14** agents were newly classified as *probably carcinogenic to humans* (Group 2A): Bitumens; occupational exposure to oxidized bitumens and their emissions during roofing; chloral and chloral hydrate; dibenz[a,j]acridine; dichloromethane, malaria (caused by infection with *Plasmodium falciparum* in holoendemic areas); Merkel cell polyomavirus (MCV); 6-nitrochrysene; 1-nitropyrene; 2-nitrotoluene; pioglitazone; polybrominated biphenyls; 1,3-propane sultone; silicon carbide whiskers. These, too, are of high concern for

their carcinogenic potential. Notably, most of these new known and probable carcinogens have been evaluated only or first by IARC.

Several of the new overall evaluations in 2010-2014 were based on contributions of mechanistic data:

Group 1: Dioxin-like polychlorinated biphenyls

Group 2A: chloral and chloral hydrate; dibenz[a,j]acridine; malaria; MCV; 6-nitrochrysene; 1-nitropyrene; 2-nitrotoluene; polybrominated biphenyls, 1,3-propane sultone; silicon carbide whiskers;

Group 2B: dibenz[c,h]acridine; 3-nitrobenzanthrone.

The Programme reacted quickly to new and emerging public health threats or new influential studies. For example, the Volume 102 meeting on radiofrequency electromagnetic fields was announced on the day of the press release on the influential Interphone study, and the Volume 105 meeting on diesel engine exhaust was announced closely following acceptance for publication of an influential US NCI/NIOSH study. In this way, IARC was the first agency to classify diesel engine exhaust as a human carcinogen. Data for two of the new Group 1 carcinogens (1,2-dichloropropane, fluoro-edenite) became available so recently that they had not even been considered by the previous Advisory Group on Future Priorities.

### **Advisory groups and scientific workshops convened by the Monographs Programme**

The Programme convened two Advisory Groups and two scientific workshops.

*Advisory Group on Priorities for the IARC Monographs during 2015-2019.* In April 2014 the Programme convened an Advisory Group of 21 senior scientists from 13 countries to prioritize agents by the extent of human exposure, suspicion of carcinogenicity, public health relevance and public concern. Prior to the meeting, the Programme solicited nominations of agents from individuals and organizations worldwide, via the Monographs website, the IARC RSS news feed, and through direct contact with the IARC Governing and Scientific Councils, WHO country offices and prior Monograph participants. Researchers, health organizations, various stakeholders with different perspectives and the public at large - a total of 49 people from 14 different countries - submitted nominations of 114 agents for consideration. The high priorities and medium priority agents recommended for evaluation (Straif et al, 2014) have been incorporated into the Research Plan for the next project period (2015-2019) and are listed in section C.

*Workshops on Tumour Concordance and Mechanisms of Carcinogenesis (April/Nov. 2012).* Volume 100 summarizes new information on the known human carcinogens, including on mechanisms of cancer causation. This will give insight into how other agents might cause cancer in humans and will be particularly useful in future assessments of new chemicals in which molecular epidemiology and information about mechanisms of carcinogenesis will play a larger role. The Volume 100 Workshops analysed tumour concordance between humans and experimental animals, and the involved mechanisms, for human carcinogens. Scientific publications on the Workshop findings will be finalized within the current project period.

*Advisory Group Meeting on Quantitative Risk Characterization (18–19 November 2013).* IARC convened an Advisory Group to advise the Programme on adding aspects of quantitative risk characterization to the current hazard identifications. The group recommended that future Monographs should summarize exposure–response relationships reported in epidemiological studies, review cancer burden and other risk scenarios from the literature. These recommendations were presented to and endorsed by the *Advisory Group on Priorities*. The Programme will implement these recommendations progressively, developing improved methods of capturing exposure and risk data, standardizing approaches to exposure–response analysis, and collaborating with other IARC Sections to develop methods for estimating attributable disease burdens.

### **Solicited public participation in the Monographs process**

Broad participation in the Monographs process has been encouraged. IARC's website announces Monograph meetings in advance and posts a Call for Data, a Call for Experts and a form to Request Observer Status. The Call for Data is especially useful in notifying the scientific community to complete and publish pertinent research within the year before a Monograph meeting, and many new articles have been submitted to IARC shortly before recent meetings. Future Monograph meetings are also announced every four months in the summaries of recent meetings that are published as a regular feature in *The Lancet Oncology* (see below).

IARC also uses its website to increase public participation in Advisory Group meetings convened by the Monographs Programme (see Advisory Group on Priorities).

In the spirit of transparency, 29 Representatives from the major funding agencies of the Programme, and from major national and European public health institutions attended the Monographs meetings. In addition, 57 individuals were granted Observer status for meetings convened during 2010–2015. Observers represent diverse perspectives, with the majority sponsored by potentially affected industries.

### **Increased public availability of Monographs results and dissemination**

Access to the Monographs has been substantially improved. Monographs and related publications are available for download free of charge from the website (<http://monographs.iarc.fr/>). In fact, IARC's very first e-PUB was the report of the Monographs Advisory Group, Air Pollution and Cancer (IARC, 2013). Since November 2013 all Monograph volumes as well as supplements 1, 4 and 7 are available online in PDF format. Reference citations in recent Monographs include hyperlinks to PubMed. A mobile version of the Monographs website was launched in June 2013, thereby making it accessible to a wider audience. In addition to increasing accessibility, the full text availability free of charge of all Monographs has resulted in substantial reduction in printing needs and associated costs.

The strong interest in the IARC Monographs is indicated by a significant increase in the access of information provided at the Programme website. In 2013, the website had a total number of 177 975 visitors from more than 160 countries, a 20% increase compared with the previous year. Analysis of the “content download” statistics also reveals the marked increase in downloads of material published by the IARC Programme. The most popular Monographs are downloaded more than 50,000 times/year and some more than 30,000 times/year almost 20 years after first publication.

IARC has initiated the development of an electronic database of Monograph results, (See C, Proposed Monograph Program), and NCI granted an administrative supplement to link this database with NCI's Databases.

Based on an agreement with The Lancet Oncology, open-access summary reports of new Monographs are published rapidly after each meeting (e.g. the summary report for Volume 105, Diesel and Gasoline Engine Exhausts, was published three days after the meeting). The summary reports also appear in the first available print issue, usually about six weeks later. The Lancet Oncology articles (starting with Volume 100) are made available in French in collaboration with the Centre Léon Bérard and a similar agreement for translation into the Korean language has been reached with the National Cancer Centre and the Ministry of Health, Republic of South Korea.

For selected Monographs covering agents of broad concern or outstanding importance to public health, press conferences are organized. Press releases are distributed to more than 4000 key mainstream and scientific media outlets worldwide, and include a link to the summary report in The Lancet Oncology; additional information is provided on the IARC website (e.g. video-recording of the press conference, Questions-and-Answers, and podcasts). Evaluations by the IARC Monographs Programme often receive worldwide news coverage. As an example, the evaluation of the carcinogenicity of outdoor air pollution was released at a press conference at WHO Headquarters in Geneva in October 2013 and subsequently extensively covered by print, broadcast and online media in the United States, Canada, Europe, Latin America, the Middle East and Asia. Beyond the media interest generated immediately after specific press releases, the Monographs programme has also been highlighted in documentaries on television and other media on the scientific evaluation of cancer hazards in general, or on specific topics (e.g. radiofrequency electromagnetic fields). There are regular requests from journalists when certain topics of general interest emerge.

The dissemination and impact of the Monographs can also be measured by the numerous invitations received by Monographs scientists to describe recent findings and participate on national and international panels assessing health assessment issues. These invitations come from a diversity of audiences including:

- International scientific conferences (e.g. AACR; UICC World Cancer Conference; International Congress of Toxicology), including those well beyond the field of public health (e.g. a philosophy conference on Causality in Science);

- International and national health assessment committees (e.g. WHO/ILO/EU International Chemical Safety Cards; ILO List of Occupational Diseases; WHO Indoor Air Quality Guidelines; WHO DDT Risk Assessment; NTP Report on Carcinogens; French ANSES and INVS, German-MAK).
- Global and national policy-making or expert committees (e.g. Conference of Parties, WHO Framework Convention on Tobacco Control; Conference of Parties, Rotterdam Convention; WHO regional offices; European Parliament debate on UV radiation and cancer; International Expert Panel on Hexavalent Chromium, Greek Ministry of Environment; French Senate hearing on electromagnetic fields; German Committee on Radiation Protection).

Moreover, the Monographs are influential globally in issues ranging from cancer hazard identification to estimating disease burden, often with direct contributions from Monographs scientists. For instance, the Monographs have direct impact on national classifications of carcinogens (e.g. US NIOSH; California Proposition 65), compensation issues (United States Government Accountability Office), and cancer awareness efforts (e.g. Cancer Australia; European Code against Cancer). Similarly, the Monographs served as the starting point for global and national estimates of the burden of cancer, e.g. Global Burden of Disease 2010 (Lim et al., 2012), and WHO Food-related Burden of Disease. Finally, Monographs evaluations figure prominently in judicial proceedings (for example, Tobacco Institute Australia v. Federation of Australian Consumer Societies).

### **Increased efficiency and quality of Monograph production and distribution**

The workflow required to produce a Monograph has been completely re-examined and modernized to strengthen programme management and to improve operations, with innovations implemented for almost every new meeting, including template invitation letters, table templates, use of an FTP site for document transfer, and RefMan travelling libraries. More recently introduced new features include the improvement and use of a Web-based content management system, the IARC Online Publication System (IOPS), to manage the submission of working papers and to facilitate pre-meeting peer review. Such peer review of all working papers by IARC scientists and Working Group members has already been shown to improve timeliness and quality of working drafts. Pre-meeting expert collaboration is further facilitated through conference calls and webinars. In order to integrate such changes in procedures, each step of the workflow has been dissected, streamlined, and documented in a team effort.

Production has been revolutionized with the development of an integrated "single-source" workflow, in which electronic documents can be formatted, referenced, copyedited, and laid out in an automated, multi-format, publishing system. The familiar "orange books" have undergone a facelift with a novel format and layout adopting a consistent IARC. This was first applied to Volume 100, A Review of Human Carcinogens, which received a "Highly Commended" in the British Medical Association Medical Book Awards of 2013. Many of these procedures pioneered by the Monographs have later been adopted IARC-wide.

### **Program leadership**

The Programme has strong scientific expertise relevant to modern cancer research. Senior leadership positions were recently filled by leading international experts in cancer epidemiology and mechanisms, enhancing the Programme's capabilities in integrative research efforts to identify cancer hazards. During the current project period the former Head of the Programme and the senior toxicologist retired. Following competitive selection processes, the new Head of the Programme (formerly senior epidemiologist of the Programme), the new senior epidemiologist and the new senior toxicologist were appointed. The two primary sections of the Monographs are thus represented by leading experts in their respective fields. These senior-level staff also supervise the scientists in the other two sections (Exposure Data and Cancer Bioassays). The strong incumbents affirm the attraction of the Programme and guarantee its successful future management.

## **C. Proposed Monograph Program**

**The Programme will provide scientific leadership and administrative support for the timely evaluation of candidate carcinogenic agents of high global relevance and concern.** The IARC Monographs Programme has evaluated nearly 1000 suspected carcinogens to date, and continues to complete more carcinogen assessments annually than any other agency. Nevertheless, given finite resources, only a fraction of potentially carcinogenic exposures can be evaluated, considering the more than 10,000 chemicals in

commercial use and the widespread exposures to biological and physical agents, medicines and lifestyle factors of potential concern. Accordingly, a rigorous prioritisation process is needed to ensure timely evaluations of high relevance to the global cancer community.

An April 2014 Advisory Group accorded priority to a broad range of chemical and biological agents and exposures for IARC Monograph evaluation (see Table 1). The rationale for these recommendations is summarized in a paper in *The Lancet Oncology* (Straif et al., 2014) and detailed in a report available on the Monographs website (IARC, 2014). Priorities include ubiquitous exposures of worldwide concern (e.g., shift work, and human cytomegalovirus), many with relevance to low- and middle-income countries (e.g., hot mate drinking). Obesity and overweight are important risk factors to be evaluated, highlighted by the United Nations non-communicable diseases agenda and affecting high-income, but increasingly also low- and middle-income countries. Priority was also accorded to pesticides with worldwide use and substantial current exposures in low- and middle-income countries. Welding fumes, affecting up to one percent of the global workforce, are another priority recommendation with expected high interest throughout the world.

**Table 1. Agents recommended by the IARC Advisory Group for high and medium priority**

<b>High priority</b>		<b>Medium priority</b>
Acrylamide, furan, and 5-(hydroxymethyl) furfural	Multi-walled carbon nanotubes	Acrolein; breast implants;
Aspartame and sucralose	Nicotine	Calcium channel blockers; coal dust; Hydrazine; lead; metal working fluids; methanol; metronidazole; beta-myrcene;
Beta-carotene	Obesity and being overweight	Other pesticides (including atrazine, DDT, glyphosate, pentachlorophenol);
Bisphenol A	Phenyl and octyl tin compounds	Beta-picoline; riddelliine;
Coffee	Physical inactivity and sedentary work	<i>Salmonella typhi</i> and <i>paratyphi</i> (chronic infection); salt; stress; talc; trimethylolpropane; triacrylate; zidovudine;
Dimethylformamide	Opium	Agents in ongoing cancer bioassays (allyl chloride, anthracene, and N,N-dimethylacetamide)
Disinfected water used for showering, bathing, swimming, or drinking	Pesticides (including carbaryl, diazinon, lindane, malathion, pendimethalin, and permethrin)	
Ethyl acrylate	Processed and unprocessed red meat	
Human cytomegalovirus	Shift work that involves circadian disruption	
Indium-tin oxide	Styrene	
Iron (in food and as supplements)	Welding	
Mate drinking	Agents recently tested in cancer bioassays	
Methyl/ethyl tertiary butyl ether, and tert-butyl alcohol		

The Programme will organize two or three Monograph meetings in each year of the proposed project. Monographs of high scientific clarity and accuracy will be prepared and published following these meetings, providing timely and relevant evaluations on a range of critical agents. Topics will include high and medium priority recommendations of the April 2014 Advisory Group. Selection, grouping, and ordering of evaluations into a series of Monographs will be based on systematic and objective review of available pivotal evidence, as well as consideration of public health concerns, including in low- and middle-income countries. Importantly, Monograph topics not identified by a prior advisory group may also be pursued, to assure timely reaction to significant new scientific studies or an urgent public health need.

To address the challenge of appropriately grouping agents and ordering recommended evaluations, systematic and objective approaches are being pioneered. Specifically, a novel chemoinformatics approach is being piloted in connection with the recommended evaluation of diverse pesticides across the triazine, carbamate, organophosphate, organochlorine, dinitroaniline, and pyrethroid classes. The pesticides include thousands of unique chemicals distributed across broad chemical and functional classes. Many pesticides are chemically related, but the extent of study and availability of information from public databases (e.g. PubMed, the Tox21 Program, the PubChem bioactivity assay database) differs across compounds and manual mining of data may be prone to bias, inefficiency, and incomplete coverage. Accordingly, we have integrated information on chemical structure similarity with the results of systematic, automated text mining of cancer-relevant information in public databases. Further hand searching of results complements the chemoinformatics

approach. In addition, potential efficiencies from grouping of chemicals within class have been ascertained. This innovation will enable systematic consideration of cross-cutting scientific issues, yielding a practical overall management strategy to maximize use of needed expertise for evaluating complex group of chemicals.

The Monographs are keenly poised to maintain current knowledge of emerging cancer hazards, through the international position within the cancer research community, close contact with leading scientists worldwide, and via surveillance of the scientific literature. Systematic text mining of cancer-relevant databases will complement other strategies for identifying significant new findings. Additionally, annual meetings of IARC's Scientific and Governing Councils allow further opportunity to identify current or emerging issues. The Monographs have demonstrated ability to react quickly, convening expert working group reviews soon after publication of pivotal studies (see Progress Report). Re-evaluation of agents previously reviewed in the IARC Monographs can be similarly stimulated if new and compelling studies emerge. Recent development of a database architecture for entry and capture of key evidence supporting IARC Monograph evaluations, being introduced during the volume 112 evaluations, will facilitate needed updates. Overall, these mechanisms will ensure the Monographs reflect the current state of priorities for global public health.

In addition to Monograph meetings supported by this proposal, the Programme will convene at least two Advisory Groups/scientific workshops of international subject-matter experts carefully screened to eliminate conflict of interest. The next Advisory Group on priorities is anticipated in 2019 and will be preceded, as outlined above, by a formal, public call for nominations. In addition, one or more workshop(s) on critical scientific issues pertinent to the identification of carcinogens will be convened. In particular, a workshop on germ cell mutagenicity was proposed by leading international experts on mutagenicity and endorsed by a scientific society on environmental mutagens. Important findings of germ cell mutagenicity and/or carcinogenicity in offspring have been reported in recent Monographs (e.g., on ionizing radiation, chemotherapeutic drugs, cigarette smoking, and the particulate fraction of air pollution). Formal evaluation of the potential to induce human germ-cell mutagenicity would significantly advance understanding of potential carcinogenicity of these and other agents in the offspring. The workshop would therefore explore strategies to systematically search and evaluate relevant evidence, considering the applicability of the successful Monographs model to evaluate germ cell mutagenicity. The evidence base will comprise exposure, epidemiology and clinical genetics, animal bioassays, and mechanistic information including germ-cell biology and emerging genomic data.

**The Programme will convene Working Groups that are scientifically rigorous, respected, and free of conflict of interest.** The carcinogenicity evaluation process used for the Monographs is widely recognized for its rigor and transparency. The evaluations are unique in representing the scientific consensus of an international Working Group of leading scientific experts. This process was again strongly endorsed by the IARC Scientific Council and in an external peer review of the Monographs Section (see Objectives and Corrective Actions). To assure consistency, the organisation and conduct of Monographs closely follow procedures published in the Preamble.

The Monographs have a strong record of recruiting a diversity of international experts to form Working Groups that are authoritative, scientifically meritorious, and highly regarded internationally. The Monographs identify leading experts from systematic searches of the literature and from public responses to the Call for Experts. Subject-matter experts are selected based on demonstrated knowledge and experience and careful screening to eliminate conflict of interest, and highly specific expertise on the evaluation topic can be supplemented with broader subject expertise. Consideration is also given to demographic diversity and balance of scientific findings and interpretations. The vast majority of the experts invited respond that they feel honoured to participate in a Monographs meeting and gladly agree to do so. Each expert critically reviews an assigned portion of the scientific literature. The Working Group then meets at IARC for eight days to discuss the evidence, develop consensus and arrive at an overall evaluation on the weight of the evidence.

The Monographs conduct open and transparent evaluations, strictly managing conflicts of interest of potential participants. Scientists with real or apparent conflicts of interest can be included as Invited Specialists. These scientists draft text on topics with no impact on carcinogenicity evaluation, but do not serve as meeting or subgroup chair and do not participate in the evaluation. Representatives from national and international public health institutions (including the National Cancer Institute) often participate in Monographs meetings because their agencies sponsor the Programme or are interested in the subject of the meeting. Stakeholders with

potential conflicts of interest may be granted Observer status, in the interest of transparency, permitting them to observe the meeting but not influence the outcome. These clearly defined roles are an important mechanism by which subject-matter experts from different perspectives, including those who may have a real or apparent conflict, may contribute important factual knowledge.

**The Programme will provide scientific leadership to improve the systematic search, evaluation and documentation of scientific data.** Carcinogenicity evaluations for the Monographs follow a rigorous and consistent methodology. Guidelines for the selection, review, synthesis and presentation of evidence are publicly available on-line and published with each Monograph volume (Preamble to the IARC Monographs, IARC, 2006). For human and animal cancer data, all pertinent literature is reviewed and evaluated by a working group of subject-matter experts carefully screened to eliminate conflict of interest. This review and evaluation is conducted according to a specified schedule, with clear timelines for evidence inclusion, summary, integration and evaluation.

The Monograph process meets the widely-shared understanding of systematic review (Antman et al., 1992; Higgins & Green, 2011) and is internationally recognized for the quality of the resulting evaluations. For example, two authoritative reviews by the US NRC, recommended the IARC Monographs process as one potential model for US EPA health assessments (NRC, 2011, 2014). Additionally, the IARC Monographs data integration process has been adapted to other evaluation methodologies aimed at applying systematic review methods developed in clinical medicine (IOM, 2011) to environmental health (Woodruff & Sutton, 2014).

Building on systematic review methods that are a historical strength of the IARC Monographs, we have identified opportunities for process improvements with input from our advisory groups and reviewers. The literature search strategies used, the numbers of studies identified and the reasons for any exclusions have not been systematically documented in past Monographs and the format and content of evidence tables has been heterogeneous. Although not affecting the outcome of Monograph evaluations, refinements to the search and evaluation of scientific publications that would increase consistency and transparency will be implemented in the proposed project period. These process improvements have been documented publicly on the Monographs website prior to Monographs Volume 112 (March, 2015). These include new on-line tools and procedures to increase clarity and objectivity of the resulting Monographs.

A first process improvement is to more efficiently conduct systematic literature searches, organize the pertinent literature retrieved, and document the results. We will use the Health Assessment Workspace Collaborative (HAWC, <https://hawcproject.org>) to perform state-of-the-art literature reviews that are comprehensive and transparent. Using HAWC, literature search strings can be created, documented and executed in PubMed. Articles identified by hand searching (e.g., of past IARC Monographs or other authoritative reviews) can also be recorded. An innovative feature of HAWC allows the disposition of each identified study to be carefully tracked using pre-specified labels or “tags.” These tags document the evidence stream(s) pertinent for included studies and function as exclusion criteria for any excluded studies. A literature tree can provide a visual overview, facilitating discussion and documentation of the results.

A second process improvement concerns standardization of tabular data presentations to better document evaluation of the identified literature results. A custom-built web-enabled tool, the IARC Table Builder, allows extraction of data pertinent to IARC evaluations into a standardized database architecture. This will promote consistent documentation of study data, as well as of expert judgements (e.g., concerning study strengths and weaknesses), during the systematic review and evaluation. It will also increase efficiency through on-screen data extraction, flexible output formats, and the ability to document fact verification. Finally, future updating of Monograph evaluations will be facilitated, as new studies can be readily added to the existing database. The Table Builder will be used to create epidemiology evidence tables for the March, 2015 Monograph meeting on pesticides, with tables for animal, mechanistic and exposure evidence to be deployed in future meetings.

**The Programme will advance the use of mechanistic data in carcinogen evaluations.** The Programme will build on important examples of the application of cutting-edge mechanistic and molecular epidemiology studies in recent monograph carcinogen hazard evaluations. In particular, a recent NCI study on trichloroethylene found increased renal cancer risk among individuals carrying at least one intact glutathione-

S-transferase *GSTT1* allele (active genotype), but not among individuals with two deleted *GSTT1* alleles (null genotype). Trichloroethylene-associated renal genotoxicity occurs predominantly through reductive metabolism involving GST conjugation. Thus the enhanced risk among individuals carrying polymorphisms in genes that are important in the reductive metabolism of trichloroethylene supports the biological plausibility of the cancer association. This additional mechanistic insight strengthened the overall hazard classification in Monograph Volume 106 and, importantly, revealed susceptibilities due to gene polymorphisms relevant for identifying potentially vulnerable populations.

Identification and incorporation of important, novel scientific findings providing insights into cancer mechanisms will be a focus in future Monographs. With this goal in mind, several innovations are being introduced with Monographs Volume 112 (March, 2015) concerning the mechanistic data evaluation methodology. State-of-the-art literature searches aimed at identifying critical mechanistic studies will be facilitated with the introduction of the HAWC on-line tool described above. Systematic approaches to the search, evaluation and inclusion of high-throughput and high-output data in public databases (e.g., PubChem, ToxRefDB) are also being pioneered. The Monographs offer a unique opportunity to have these novel data streams evaluated in the context of epidemiologic, animal bioassay, and traditional toxicology evidence of carcinogenesis by the world's leading experts. Additionally, the mechanistic discussion has been restructured to more explicitly analyse evidence for the key characteristics of carcinogens identified during the Volume 100 Monographs and two subsequent expert workshops (see Table 2). Overall, these approaches will facilitate comprehensive inclusion of important studies with systematic consideration of the range of available mechanistic data informative of the overall evaluation of carcinogenic hazard. The IARC Table Builder will aid in standardising mechanistic data capture, as well as facilitating future analyses across evaluations. These developments will aid the Monographs to prepare for future evaluations of newly introduced chemicals, including those for which mechanistic data provide the primary evidence of carcinogenicity.

Characteristic	Example relevant evidence	Linked characteristics
1. Electrophilic or ability to undergo metabolic activation	Parent compound or metabolite with an electrophilic structure, formation of DNA or protein adducts	2,3,4,7,8,9
2. Genotoxic	DNA damage, intercalation, gene mutations, chromosome aberrations	1,3,4,5,10
3. Alter DNA repair/genomic instability	Alterations of DNA replication or repair	1,2,4,6,7,9,10
4. Induce epigenetic alterations	DNA methylation, histone modification, microRNAs	1,6,10
5. Oxidative stressor	Oxidative stress, oxidative damage to macromolecules	2,6,8,10
6. Induce chronic inflammation	Elevated white blood cells, myeloperoxidase activity, altered cytokine and/or chemokine production	3,4,5,7,8,10
7. Immunosuppressant	Decreased immunosurveillance, immune dysfunction	1,3,6,8,9
8. Modulate receptor-mediated effects	Receptor in/activation or ligand modulation	1,5,6,7,10
9. Induce immortalization	Inhibition of senescence, cell transformation	1,3,7,10
10. Alter cell proliferation, cell death and nutrient supply	Increased proliferation, decreased apoptosis, changes in growth factors, energetics or signaling pathways related to cell cycle or replication, angiogenesis	2,3,4,5,6,8,9

**The Programme will take steps to ensure wide dissemination of evaluation results and facilitate access to the Monographs and supporting data.** The topics of upcoming meetings are announced a year in advance on the Monographs website, which is consulted by individuals from approximately 160 countries. These postings are followed by email alerts to IARC Participating States and WHO country offices before each Monographs meeting. Upon conclusion of an evaluation, the results and key findings are summarized in an article in *The Lancet Oncology*, which is available online for free download. At the same time IARC Participating States and WHO country offices are informed about the findings. Additional summaries may also

be published in key national journals; e.g., the results of Volume 109 (Outdoor Air Pollution) were published in French and Chinese journals, the latter with a Chinese translation (Loomis et al., 2014a; 2014b).

In the proposed project period, the Programme will build on established actions to further enhance access to information from the Monographs. In recognition that information is now largely sought and delivered through digital technology, the IARC Monographs will be deposited on the NCBI Bookshelf where the volumes will be indexed, searchable and available for downloading. Future volumes of the Monographs will be produced in a variety of electronic formats, including e-Books readable by computers and a variety of mobile devices. Increasing use of electronic publication will allow the routine print run to be reduced to 200 copies of each volume, with an option to print a physical copy on demand.

In addition to enhanced electronic publication of the Monographs, the evaluation results will be available through PubCan, a custom-built searchable online database with an interactive user interface. Users will be able to browse or search by agent, organ system or Monograph volume and retrieve evaluation results, summaries of the evidence and the cancer sites affected. Through an administrative supplement from NCI, the PubCan database will be linked to the database of NCI research grants. This linkage would allow users to identify relevant research and help IARC to gauge when new data may become available to support future evaluations. Further links are envisioned, e.g. with the International Classification of Diseases, 11<sup>th</sup> revision.

The IARC Press Officer in close collaboration with the Monographs team will disseminate Monograph findings to the news media, the scientific community and the general public through press releases, online news items and other media. Press conferences will be held for especially important evaluations, and may be coordinated with publication of the summary in The Lancet Oncology. To ensure that the Monograph results are also understandable, to a wide audience, the Programme will collaborate with IARC's Communications Group to develop plain-language explanations of the evaluation process and the categories of evidence. These statements will be used in communicating with the news media and the general public and will be posted on the Programme website as a frequently-asked questions (FAQ) document.

The Programme will advance the use of new electronic media to disseminate and explain Monograph findings. IARC has begun to use podcasts and online audiovisuals to disseminate key messages including the results of Monograph evaluations. The Communication Group plans to hire a specialist to develop communication through social media. The Programme will work with this specialist to develop a social media strategy for disseminating information about the Monographs.

**The Programme will engage in collaborations with national and international organizations with aims to improve the practice of evaluating potential carcinogens worldwide, as well as to enhance the quality, transparency and efficiency of reviews conducted for the Monographs.** During the current funding period, we organized workshops and meetings on systematic review methods with participation from WHO Headquarters, and health agencies in Europe and the United States. Approaches were compared across agencies with the recognition that some efficiency might be gained by collaborating to develop review tools. The Programme also hosted a seminar focused on the Navigation Guide review methodology for environmental health (Woodruff & Sutton, 2014) and presented the systematic review and evidence integration approach used for the Monographs to national health agencies in France and the United States. Specifically, the Programme participated in a workshop organized by the US EPA IRIS program in response to US NRC (2011, 2014) reviews that cited as exemplary the Monographs methodology, and provided similar information in response to a request from the US GAO.

We will carry the above developments forward in the proposed project period. As noted previously, we will use HAWC online tool to support state-of-the-art literature review for Monograph evaluations beginning in 2015. HAWC was initiated with support from the US EPA and is being explored in environmental health assessments by US state and national agencies, including the National Toxicology Program. At IARC's initiative, which began during a 2014 internship of the developer, HAWC will be further developed and adapted to the Monographs process. The literature searching, tagging and visualization features of HAWC will enhance the efficiency and transparency of literature reviews.

The previously-described IARC Table Builder will be further developed in collaboration with the National Toxicology Program Report on Carcinogens. The web-based Table Builder will both improve the consistency with which tabulated evidence is presented and enhance efficiency in extracting, manipulating, displaying and fact-checking data during the evaluation process and in producing and updating finished Monographs.

IARC will continue to cooperate closely with the WHO in relation to cancer within the NCD agenda and contribute in its role as a member of the UN Inter-Agency Task Force on NCDs. We will pursue further engagement with the WHO Guideline Review Committee, which is responsible for ensuring that WHO Guidelines are of high methodological quality and are developed through a transparent, evidence-based process. While the Monographs have an established methodology that clearly satisfies the key criteria for WHO systematic reviews and is in some respects more rigorous, notably with respect to avoiding conflict of interest, further harmonisation of procedures will streamline a more direct implementation of Monographs findings into global policy.

**The Programme will regularly evaluate the extent to which it is achieving its objectives and take corrective action as needed.** Regular reviews of performance are carried out at the levels of the Programme as whole, each Monograph meeting, and individual members of staff.

IARC units are evaluated every 5 years by peer-review committees composed of external experts. These reviews provide valuable guidance regarding the achievements and direction of the Programme. Corrective actions recommended by the review panel are addressed in a report to IARC's Scientific Council and implemented during the ensuing 5 years. The Section of IARC Monographs was last reviewed in January 2014 by a panel that included a member from the NCI. The Section received the highest possible rankings for performance (Outstanding) and fit with the Agency's mission (Perfect). While no major weaknesses were noted, several actions to address the panel's recommendations are among the initiatives proposed in this application. These include: the strategy for timely selection of agents of global concern, including for low- and middle-income countries; steps to develop a robust, efficient, and transparent methodology for evaluation of mechanistic data, and plans for maximizing dissemination and clear communication of information. In the year following the review the Director reports back to the Scientific Council on actions taken to address comments of the review panel. The next review in January 2019 will occur during the proposed project period, providing an opportunity to evaluate the success of the proposed actions.

After each Monograph meeting, the conduct and outcome of the meeting will be reviewed by the Programme staff. Advice will also be solicited from members of the Working Group. Any important problems identified during the review will be discussed and solutions developed for implementation in future meetings. In collaboration with the IARC Communication Group, we will regularly monitor indicators of Monographs' impact and public access to information, including web downloads of Monographs, news items and press releases; requests for information from governments, NGOs, individuals, and the news media, and articles in print and electronic media. With IARC's Press Officer, we will use this information to develop strategies to ensure that information of high public importance is appropriately disseminated.

The Programme leadership and staff will undergo annual performance evaluations according to IARC's established procedures. All staff members, including Programme leaders, develop an annual work plan with their supervisors. Specific objectives are stated and performance relative to them is reviewed mid-year and at year end. Annual work plans include professional development goals, such that staff will be encouraged to maintain scientific engagement through authorship and participation in conferences, and to seek training or other experiences to advance their skills. Supervisors may recommend further development activities or corrective measures if performance problems are noted. IARC conducts periodic management training and evaluations for unit leaders with supervisory responsibilities, including a "360-degree" evaluation with input from staff members, peers, and IARC administration.

## Progress Report Publication List

### IARC Monographs volumes published since 2010

- IARC. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Vol. 92, Some non-heterocyclic polycyclic aromatic hydrocarbons and some related exposures. Lyon, IARC, 2010 (available free of charge): <http://monographs.iarc.fr/ENG/Monographs/vol92/index.php>
- IARC. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Vol. 93, Carbon black, titanium, and talc. Lyon, IARC, 2010 (available free of charge): <http://monographs.iarc.fr/ENG/Monographs/vol93/index.php>
- IARC. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Vol. 94, Ingested nitrate and nitrite and cyanobacterial peptide toxins. Lyon, IARC, 2010 (available free of charge): <http://monographs.iarc.fr/ENG/Monographs/vol94/index.php>
- IARC. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Vol. 95, Household use of solid fuels and high-temperature frying. Lyon, IARC, 2010 (available free of charge): <http://monographs.iarc.fr/ENG/Monographs/vol95/index.php>
- IARC. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Vol. 96, Alcohol consumption and ethyl carbamate. Lyon, IARC, 2010 (available free of charge): <http://monographs.iarc.fr/ENG/Monographs/vol96/index.php>
- IARC. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Vol. 98, Painting, fire-fighting, and shift-work. Lyon, IARC, 2010 (available free of charge): <http://monographs.iarc.fr/ENG/Monographs/vol98/index.php>
- IARC. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Vol. 99, Some aromatic amines, organic dyes, and related exposures. Lyon, IARC, 2010 (available free of charge): <http://monographs.iarc.fr/ENG/Monographs/vol99/index.php>
- IARC. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Vol. 100A, A review of human carcinogens: Pharmaceuticals. Lyon, IARC, 2012 (available free of charge): <http://monographs.iarc.fr/ENG/Monographs/vol100A/index.php>
- IARC. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Vol. 100B, A review of human carcinogens: Biological agents. Lyon, IARC, 2012 (available free of charge): <http://monographs.iarc.fr/ENG/Monographs/vol100B/index.php>
- IARC. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Vol. 100C, A review of human carcinogens: Arsenic, metals, fibres, and dusts. Lyon, IARC, 2012 (available free of charge): <http://monographs.iarc.fr/ENG/Monographs/vol100C/index.php>
- IARC. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Vol. 100D, A review of human carcinogens: Radiation. Lyon, IARC, 2012 (available free of charge): <http://monographs.iarc.fr/ENG/Monographs/vol100D/index.php>
- IARC. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Vol. 100E, A review of human carcinogens: Personal habits and indoor combustions. Lyon, IARC, 2012 (available free of charge): <http://monographs.iarc.fr/ENG/Monographs/vol100E/index.php>
- IARC. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Vol. 100F, A review of human carcinogens: Chemical agents and related occupations. Lyon, IARC, 2012 (available free of charge): <http://monographs.iarc.fr/ENG/Monographs/vol100F/index.php>

- IARC. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Vol. 101, Some chemicals present in industrial and consumer products, food and drinking-water. Lyon, IARC, 2012 (available free of charge): <http://monographs.iarc.fr/ENG/Monographs/vol101/mono101.pdf>
- IARC. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Vol. 102, Non-ionizing radiation, part 2: Radiofrequency electromagnetic fields. Lyon, IARC, 2013 (available free of charge): <http://monographs.iarc.fr/ENG/Monographs/vol102/mono102.pdf>
- IARC. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Vol. 103, Bitumens and bitumen emissions, and some *N*- and *S*-heterocyclic polycyclic aromatic hydrocarbons. Lyon, IARC, 2013 (available free of charge): <http://monographs.iarc.fr/ENG/Monographs/vol103/mono103.pdf>
- IARC. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Vol. 104, Malaria and some polyomaviruses (SV40, BK, JC, and Merkel cell viruses). Published on-line, 2013 (available free of charge): <http://monographs.iarc.fr/ENG/Monographs/vol104/mono104.pdf>
- IARC. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Vol. 105, Diesel and gasoline engine exhausts and some nitroarenes. Published on-line, 2013 (available free of charge): <http://monographs.iarc.fr/ENG/Monographs/vol105/index.php>
- IARC. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Vol. 106, Trichloroethylene, tetrachloroethylene and some other chlorinated agents. Published on-line, 2014 (available free of charge): <http://monographs.iarc.fr/ENG/Monographs/vol106/index.php>

#### IARC Monographs summaries published in The Lancet Oncology since 2010

- Baan R, Grosse Y, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Islami F, Galichet L, Straif K, on behalf of the WHO International Agency for Research on Cancer Monograph Working Group. Carcinogenicity of radiofrequency electromagnetic fields. *Lancet Oncol.* 2011; 12: 624-626, PMID: 21845765 (available free of charge): [http://ac.els-cdn.com/S1470204511701474/1-s2.0-S1470204511701474-main.pdf?\\_tid=2c9a8a32-0753-11e4-8434-00000aacb361&acdnat=1404901634\\_e28791f6e89e79252e32ec6d41b73b48](http://ac.els-cdn.com/S1470204511701474/1-s2.0-S1470204511701474-main.pdf?_tid=2c9a8a32-0753-11e4-8434-00000aacb361&acdnat=1404901634_e28791f6e89e79252e32ec6d41b73b48)
- Benbrahim-Tallaa L, Baan RA, Grosse Y, Lauby-Secretan B, El Ghissassi F, Bouvard V, Guha N, Loomis D, Straif K, on behalf of the WHO International Agency for Research on Cancer Monograph Working Group. Diesel and gasoline engine exhausts and some nitroarenes. *Lancet Oncol* 2012; 13: 663-664, PMID: 22946126 (available free of charge): [http://ac.els-cdn.com/S1470204512702802/1-s2.0-S1470204512702802-main.pdf?\\_tid=0122a754-0753-11e4-9e17-00000aab0f6b&acdnat=1404901561\\_a1b6303be981e10b09c5508bb25bbdfc](http://ac.els-cdn.com/S1470204512702802/1-s2.0-S1470204512702802-main.pdf?_tid=0122a754-0753-11e4-9e17-00000aab0f6b&acdnat=1404901561_a1b6303be981e10b09c5508bb25bbdfc)
- Benbrahim-Tallaa L, Lauby-Secretan B, Loomis D, Guyton KZ, Grosse Y, El Ghissassi F, Bouvard V, Guha N, Mattock, Straif K, on behalf of the International Agency for Research on Cancer Monograph Working Group, Lyon, France. The carcinogenicity of perfluoro-octanoic acid, tetrafluoroethylene, dichloromethane, 1,2-dichloropropane, and 1,3-propane sultone. *Lancet Oncol.* 2014; 15: 924-925, PMID: 25225686 (available free of charge) [http://download.thelancet.com/pdfs/journals/lanonc/PIIS147020451470316X.pdf?id=aaadNskWFDHB9\\_KluUrGu](http://download.thelancet.com/pdfs/journals/lanonc/PIIS147020451470316X.pdf?id=aaadNskWFDHB9_KluUrGu)
- Bouvard V, Baan R, Grosse Y, Lauby-Secretan B, El Ghissassi F, Benbrahim-Tallaa L, Guha N, Straif K, on behalf of the WHO International Agency for Research on Cancer Monograph Working Group. Carcinogenicity of malaria and of some polyomaviruses. *Lancet Oncol.* 2012; 13: 339-340, PMID:22577663 (available free of charge): [http://ac.els-cdn.com/S1470204512701250/1-s2.0-S1470204512701250-main.pdf?\\_tid=c290a72e-0753-11e4-bd23-00000aab0f6b&acdnat=1404901885\\_db322c8e382b74783588d2e691491caf](http://ac.els-cdn.com/S1470204512701250/1-s2.0-S1470204512701250-main.pdf?_tid=c290a72e-0753-11e4-bd23-00000aab0f6b&acdnat=1404901885_db322c8e382b74783588d2e691491caf)

- Grosse Y, Baan R, Secretan-Lauby B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Islami f, Galichet L, Straif K, on behalf of the WHO International Agency for Research on Cancer Monograph Working Group. Carcinogenicity of some chemicals in industrial and consumer products, some food contaminants and additives, and water chlorination by-products. *Lancet Oncol.* 2011; 12: 328-329, PMID: 21598447 (available free of charge): [http://ac.els-cdn.com/S1470204511700882/1-s2.0-S1470204511700882-main.pdf? tid=612799ce-0754-11e4-b9ea-00000aacb35e&acdnat=1404902151\\_eb9a6bb3f7e8faed5cd80b8e0ba80fed](http://ac.els-cdn.com/S1470204511700882/1-s2.0-S1470204511700882-main.pdf? tid=612799ce-0754-11e4-b9ea-00000aacb35e&acdnat=1404902151_eb9a6bb3f7e8faed5cd80b8e0ba80fed)
- Grosse Y, Loomis D, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Baan R, Mattock H, Straif K; International Agency for Research on Cancer Monograph Working Group. Carcinogenicity of some drugs and herbal medicines. *Lancet Oncol.* 2013; 14: 807-808, PMID: 24058961 (available free of charge): [http://ac.els-cdn.com/S1470204513703292/1-s2.0-S1470204513703292-main.pdf? tid=a38479c2-0754-11e4-80bc-00000aab0f01&acdnat=1404902263\\_fc60bc577fb7ef4bdc5cadf4ba91af50](http://ac.els-cdn.com/S1470204513703292/1-s2.0-S1470204513703292-main.pdf? tid=a38479c2-0754-11e4-80bc-00000aab0f01&acdnat=1404902263_fc60bc577fb7ef4bdc5cadf4ba91af50)
- Grosse Y, Loomis D, Guyton K, Lauby-Secretan B, El Ghissassi F, Bouvard V, Benbrahim-Tallaa L, Guha N, Scoccianti C, Mattock H, Straif K. Carcinogenicity of fluoro-edenite, silicon carbide fibres and whiskers, and carbon nanotubes. *Lancet Oncol.* 2014; 15: 1427-1428, PMID: **not yet indexed** (available free of charge): [http://dx.doi.org/10.1016/S1470-2045\(14\)71109-X](http://dx.doi.org/10.1016/S1470-2045(14)71109-X)
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## **5. Protection of Human Subjects**

Not applicable.

## **6. Inclusion of Women and Minorities**

Not applicable.

## **7. Inclusion of Children**

Not applicable.

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