NICHD–INSERM Scholar Program

APPLICATION INSTRUCTIONS

Application Deadline:	**December 31, 2018**
Notification of Award:	February 15, 2019
Begin Fellowship by:	June 3, 2019

The NICHD–Inserm Scholar program provides a unique opportunity for U.S. and French scientists to obtain postdoctoral training with French and U.S. mentors, respectively. The binational postdoctoral research fellowships are cosponsored by the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD) and Institut National de la Santé et de la Recherche Médicale (Inserm).

Each fellow benefits from an intensive research training experience designed to enhance the fellow's ability to conduct independent research upon return to his or her home country.

In fiscal year 2019, NICHD will support one award for a French scientist to work in the United States with a mentor at NICHD Intramural (Division of Intramural Research), and Inserm will support one award for a U.S. scientist to work in France with a mentor at an Inserm research unit or center.

NICHD–Inserm Fellowships are awarded for up to a 24-month continuous period of time with an evaluation after the first fellowship year. Successful candidates will be required to agree to complete the full 12- or 24-month fellowship period.

WHAT THE FELLOWSHIPS PROVIDE

French scientists spending their fellowship in the United States will receive from NICHD an annual stipend of an approximate range of $49,000 – 67,000 USD, depending on the years of research experience, for living and personal expenses and an estimated $14,000 USD supplemental funding to cover the cost of personal health insurance that must meet the health insurance requirements specified in the J-1 regulations, and professional development activities. NICHD will provide one roundtrip, economy class airfare for the fellow only.

U.S. scientists spending their fellowship in France will be employed by Inserm under a temporary contract providing an annual gross salary of 34 200€ – 45 600€ depending upon the number of years of postdoctoral experience, including personal health insurance. Inserm will provide one roundtrip, economy class Washington, DC-France airfare for the fellow only.

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REQUIREMENTS FOR APPLICANTS

French applicants must:

- Hold an earned doctoral degree in medicine, biomedical sciences, population science, or public health.
- Have completed postdoctoral research in an Inserm unit (*for more than 2 years but less than 5 years total, with a PhD obtained within the past 5 years*), demonstrating the ability to engage in independent research.
- Be a citizen or permanent resident of France.
- Live and work in France, in an Inserm research unit, at the time the application is submitted.
- Be eligible for a J-1 visa to enter the United States.
- Be proficient in written and spoken English.

U.S. applicants must:

- Hold an earned doctoral degree in medicine, biomedical sciences, population science, or public health.
- Have completed postdoctoral research demonstrating the ability to engage in independent research.
- Be a citizen or permanent resident of the United States.
- Live and work in the United States at the time the application is submitted.
- Be eligible for a temporary-stay visa to work in France.

REQUIREMENTS FOR MENTORS

French mentors:

- Must be conducting research aligned with the mission of NICHD.
- Must be a researcher in one of the laboratories included in the "*List of Inserm's Host Laboratories and Research Programs"* (list enclosed at the end of the document)

U.S. mentors:

- Should be a current NICHD Principal Investigator in the Division of Intramural Research whose research program will be active throughout the proposed fellowship period. A complete list can be found at https://annualreport.nichd.nih.gov/.

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APPLICATION OVERVIEW

The NICHD–Inserm Scholar program application requires careful and thorough coordination between the applicant and mentor. Individuals wishing to apply must:

- Contact an eligible researcher who is willing to serve as a mentor.
  - U.S applicants refer to the "*List of Inserm's Host Laboratories and Research Programs"* to identify an eligible researcher.
  - French applicants refer to the annual report (https://annualreport.nichd.nih.gov/) for the *list of prospective NICHD mentors* to identify an eligible researcher.
- Notify the NICHD, Office of Education and the Inserm Department of National and Foreign Affairs of their plans to apply.
- Write no more than three-page Research Plan for working with the mentor to investigate biomedical sciences aligned with NICHD's and Inserm's research missions.
- Have the mentor complete his or her section of the application and submit it to the appropriate agency.

APPLICATION INSTRUCTIONS

1. Incomplete applications will ***NOT*** be reviewed.
2. Applications must be typewritten, single-spaced, and single-sided. Applications must be written in English language only.
3. Applicant must complete Part I, Part III—Applicant Section, Part IV, Part V, and Part VI. Applicant should ensure he/she has signed the Applicant Certification and Acceptance section of Part I.
4. Applicant should attach all supporting documents listed on Part III–Application Checklist.
5. Applicant should forward his/her completed sections of the application to the eligible U.S. or French scientist who has agreed to be his/her mentor.
6. The mentor will then complete Part II, Part III—Mentor Section, Part VII, Part VIII, Part IX, and Part X. The mentor should ensure he/she has signed the Mentor Certification and Acceptance section of Part II
   - ***French applicants:*** On Part X–Sponsoring Institution Certifications and Assurances, signatures are required from the U.S. mentor, the department head, and an official signing for the sponsoring institution. The *sponsoring institution official* must be a separate individual from the mentor.
   - ***U.S. applicants:*** On Part X–Sponsoring Institution Certifications and Assurances, signatures are required from the French mentor (the supervising scientist at the host laboratory) and the director of the host laboratory/research center.
7. The mentor should attach all supporting documents listed on Part III–Application Checklist.

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8. Once all signatures are secured and supporting documents attached, the mentor should submit the application.
   - ***French applicants:*** The U.S. mentor should submit the application to the NICHD, Office of Education.
   - ***U.S. applicants:*** The French mentor should submit the application to the International affairs division of the Inserm Department of National and Foreign Affairs (DPRE).

APPLICATION AND REFERENCE SUBMISSION

Submit the completed documents electronically by the December 31st2018 deadline to:

NICHD
Office of Education,
31 Center Dr., Room 1B44
Bethesda, MD 20892-2425
USA
Telephone: 301-435-1104
Contact: Dr. Erin Walsh
erin.walsh@nih.gov

Inserm
Inserm-USA Office
Embassy of France in the US
4101 Reservoir Rd, NW
Washington, DC 20007
Telephone: +1 202 944 6253
Contact: Philippe Arhets at
Inserm-usa@ambascience-usa.org

Each participant will evaluate their own candidates following their agreed internal procedure. The results of the evaluation and the selection of the candidates will be then discussed between the parties in order to reach a common approval.

PROFESSIONAL REFERENCES

Two reference letters supporting the applicant's scientific record should be sent to the sponsoring institution (contact information above).

FOR MORE INFORMATION

- http://www.nichd.nih.gov and http://www.inserm.fr
- Email: erin.walsh@nih.gov OR philippe.arhets@ambascience-usa.org

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PREPARING YOUR NICHD–INSERM FELLOWSHIP RESEARCH PLAN

The Research Plan (Part VI) is the most important part of the application. This section should be well formulated and presented in sufficient detail so that reviewers can evaluate its scientific merit. The applicant should actively seek the advice and cooperation of the mentor while preparing the Research Plan. The mentor's collaboration is important, but the ***applicant*** must write the Research Plan. Be specific and informative, and avoid redundancy. Brevity and clarity in the description of the Research Plan are considered indicative of an applicant's approach to the research objective and ability to conduct a superior project. The Research Plan ***should not exceed three pages*** in addition to the face page. Literature citations are not included in the page limit. The applicant should use the following format:

1. ***Specific Aims.*** State the specific purposes of the research and the hypotheses/research questions to be tested.
2. ***Background and Significance.*** Briefly describe the background of the Research Plan. This is an important consideration in the initial review of your application. Concisely state the importance of the Research Plan by relating specific aims to broad, long-term objectives.
3. ***Research Design and Methods.*** Discuss in detail the following:
   a. The research design and procedures to be used to accomplish the specific aims
   b. Sampling design, if conducting primary data collection
   c. The analytic plan detailing the statistical approach to addressing the hypotheses
   d. Any precautions necessary for procedures, situations, or materials that may be hazardous to personnel
   e. Potential limitations of the proposed project
   f. The timeline for completion of the proposed investigation
   g. The contributions that this project will make to the field of biomedical sciences, population science, and public health.
4. ***NIH Regulations on the Conduct of Research.*** Research conducted in the United States as part of a NICHD–Inserm Fellowship is subject to the same U.S. Federal regulations, policies, guidelines, and review considerations as are all National Institutes of Health (NIH) research project grant applications. In this section of the Research Plan, applicants must demonstrate that they understand and have planned to comply with those rules, particularly if the research involves human subjects or vertebrate animals. For a complete discussion of the NIH regulations, consult the NIH Grants Policy Statement at http://grants.nih.gov/grants/policy/nihgps_2010/index.htm or Part III, Section 2 of the *U.S. Department of Health and Human Services, Public Health Service Grant Application, PHS 398 Instructions*, http://grants2.nih.gov/grants/funding/phs398/phs398.html.
5. ***Inserm Regulations on the Conduct of Research.*** Research conducted in France as part of a NICHD–Inserm Fellowship is subject to the same French and European regulations, policies, guidelines and review considerations as are all research projects and activities performed within and/or supported by Inserm. In this section of the Research Plan, applicants must demonstrate that they understand and have planned to

comply with those rules, particularly if the research involves human subjects or vertebrate animals. For a complete discussion of the Inserm regulations, please contact thierry.galli@inserm.fr

6. ***Literature Citations.*** Provide literature citations at the end of the Research Plan. Each citation must include the authors' names, book or journal titles, volume number, page numbers, and year of publication.

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REVIEW CRITERIA

Applications are peer-reviewed through a competitive process and assessed according to scientific merit, the proposal's relevance to NICHD's and Inserm's research missions, adequacy of the applicant's education and experience to conduct the proposed research, likelihood that the proposed research can be completed within the proposed timeline, and compatibility of the applicant's and mentor's objectives. Several factors may enhance the rating of an application, even though all of these items are not necessarily required.

APPLICANT

- Previous experience and education are commensurate with the proposed study.
- Although not yet considered a senior scientist, the applicant has demonstrated sufficient research experience to successfully complete the proposed study.
- The two letters of reference support the applicant's scientific record.
- The applicant has authored a peer-reviewed scientific article in the area or closely related area of the proposed research.

RESEARCH PLAN

- Describes how the proposed study is unique, how it will expand or advance the field of drug abuse research, and how it is consistent with the applicant's career goals.
- Clearly and concisely states proposed aims, goals, and objectives appropriate to the stated hypotheses, conveying scientific sophistication and strong analytical skills.
- Thoroughly reviews the relevant literature.
- Acknowledges any potential regulatory issues or methodological limitations.
- Clearly states the applicant's role in the proposed research and the collaborative plan between the applicant and the mentor.
- Describes what skills and experiences will be gained in the process of working with the mentor, why that proposed training would not otherwise be available to the applicant, and how those skills will be utilized when the applicant returns home.
- Includes a realistic timeline for completing the proposed study within the fellowship period.

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Application

☐ U.S. Applicant ☐ French Applicant

(English Language Only)

Part I—Applicant Information

1. Name of Applicant (family name, given name, middle initial):

_____

2. Advanced Degree(s):

_____

3. Position Title:

_____

4. Name of Institution:

_____

5. Department, Division, Service, Laboratory:

_____

6. Institution Mailing Address (street address, city, state, postal code):

_____

7. Country:

_____

8. Office Phone (country code, city code, number):

_____

9. Office Fax (country code, city code, number):

_____

10. Office E-mail:

_____

11. Permanent Home Address (street address, city, country, postal code):

_____

12. Home Phone (country code, city code, number):

_____

13. Alternative E-mail:

_____

Applicant Certification and Acceptance

I certify that the statements herein are true, complete, and accurate to the best of my knowledge, and accept the obligation to comply with terms and conditions if a fellowship is awarded as a result of this application. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties.

Applicant's Signature _____Date ___

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Applicant Last Name: Mentor Last Name:

Part II—Mentor Information

1. Name of Mentor:
2. Position Title:
3. Institution:
4. Department, Division, Service, Laboratory:
5. Office Mailing Address (street address, city, state, postal code):
6. Country:
7. Office Phone (country code, city code, number):
8. Office Fax Number (country code, city code, number):
9. E-mail:
10. Alternative E-mail:

Mentor Certification and Acceptance

I certify that the statements herein are true, complete, and accurate to the best of my knowledge, and accept the obligation to comply with terms and conditions if a fellowship is awarded as a result of this application. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties.

Mentor's Signature _____ Date _____

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Applicant Last Name: Mentor Last Name:

Part III—Application Checklist

To ensure that ***all*** documents supporting the NICHD–Inserm Research Fellowship application are properly completed and included with your application, please check the appropriate items listed below and return this checklist with your application. Only COMPLETE applications will be reviewed.

1. Applicant To Complete and/or Provide the Following:
   - ☐ Form Part I and sign Certification and Acceptance Statement
   - ☐ Form Part III—Applicant Section
   - ☐ Form Parts IV and V
   - ☐ Form Part VI—Research Plan *(not to exceed three pages, excluding literature citations)*
   - ☐ Certification of doctoral degree(s) (including English translation if necessary)
   - ☐ List of peer-reviewed publications
   - ☐ Appendix *(optional):* Applicants who have authored or coauthored articles in peer-reviewed scientific journals may submit a maximum of three publications.

2. Mentor To Complete and/or Provide the Following:
   - ☐ Form Part II and sign Certification and Acceptance Statement
   - ☐ Form Part III—Mentor Section
   - ☐ Form Parts VII, VIII, and IX
   - ☐ Form Part X and obtain necessary institution signatures as indicated
   - ☐ <u>French Applicant With U.S. Mentor:</u>

     Letter from U.S. mentor's institution representative confirming institution as a sponsor for the U.S. Department of State "J" Exchange Visitor Program and the institution's eligibility to prepare and issue the requisite Form DS-2019 for the applicant and his/her dependents. The fellowship is contingent upon approval by the NIH Division of International Services, Department of State, and the Department of Homeland Security under all applicable immigration regulations.
     - Upon acceptance of the applicant into the program, the U.S. mentor's institution or center must submit the required documents to the Division of International Services, Office of Research Services, National Institutes of Health to process the request for the NIH Visiting Program

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Applicant Last Name: Mentor Last Name:

Part IV—Applicant's Personal History

Add an additional page if more space is needed.

1. Education—List all postsecondary institutions you attended, beginning with the most recent.

   a) Name and Location of Institution: _____
   Major Field(s) of Study: _____
   Begin and End Dates of Attendance (Month, Year to Month, Year): _____
   Name of Diploma or Degree: _____
   Date Diploma/Degree Received (Month, Year): _____

   b) Name and Location of Institution: _____
   Major Field(s) of Study: _____
   Begin and End Dates of Attendance (Month, Year to Month, Year): _____
   Name of Diploma or Degree: _____
   Date Diploma/Degree Received (Month, Year): _____

   c) Name and Location of Institution: _____
   Major Field(s) of Study: _____
   Begin and End Dates of Attendance (Month, Year to Month, Year): _____
   Name of Diploma or Degree: _____
   Date Diploma/Degree Received (Month, Year): _____

   d) Name and Location of Institution: _____
   Major Field(s) of Study: _____
   Begin and End Dates of Attendance (Month, Year to Month, Year): _____
   Name of Diploma or Degree: _____
   Date Diploma/Degree Received (Month, Year): _____

2. Title(s) of Theses/Dissertations.

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Applicant Last Name: Mentor Last Name:

Part IV—Applicant's Personal History (continued)

Add an additional page if more space is needed.

3. Additional Training
(include U.S. National Institutes of Health or Inserm-sponsored activities or funding)

a) Activity/Event: _____

Topic Field: _____

Institution Host/Sponsor: _____

Begin and End Date(s) (Month, Year to Month, Year): _____

b) Activity/Event: _____

Topic Field: _____

Institution Host/Sponsor: _____

Begin and End Date(s) (Month, Year to Month, Year): _____

c) Activity/Event: _____

Topic Field: _____

Institution Host/Sponsor: _____

Begin and End Date(s) (Month, Year to Month, Year): _____

4. List Your Current Employment.

Name Current Employer: _____

City and Country of Current Employer: _____

Current Job Title: _____

Begin and End Date(s) (Month, Year to Month, Year): _____

Describe your current job responsibilities:

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Applicant Last Name: Mentor Last Name:

Part IV—Applicant's Personal History (continued)

Add an additional page if more space is needed.

5. Previous Employment.

   a) Employer/Hosting Institution: _____

   Job/Position Title: _____

   Begin and End Date(s) (Month, Year to Month, Year): _____

   Primary job/position responsibilities: _____

   b) Employer/Hosting Institution: _____

   Job/Position Title: _____

   Begin and End Date(s) (Month, Year to Month, Year): _____

   Primary job/position responsibilities: _____

   c) Employer/Hosting Institution: _____

   Job/Position Title: _____

   Begin and End Date(s) (Month, Year to Month, Year): _____

   Primary job/position responsibilities: _____

6. List your 5 to 10 most relevant peer-reviewed publications.

7. List your significant honors, awards, projects, or other accomplishments.

8. Speak to your level of proficiency in reading, speaking, and comprehending English.

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Part V—Applicant’s Travel Information

Applicant Name *(*family name, given name, middle initial): _____
Date of Birth (mm/dd/yyyy): _____
Place of Birth (city and country): _____
Nationality (listed on passport): _____ Sex: _____
Passport Issued: ☐ No ☐ Application Pending ☐ Yes, Expiration Date: _____
Issuing Country: _____

Traveling with Applicant during Fellowship:

Name *(*family name, given name, middle initial): _____
Relationship to Applicant (spouse, child, etc.): _____
Date of Birth (mm/dd/yyyy): _____
Place of Birth (city and country): _____
Nationality (listed on passport): _____ Sex: _____
Passport Issued: ☐ No ☐ Application Pending ☐ Yes, Expiration Date: _____
Issuing Country: _____

Name *(*family name, given name, middle initial): _____
Relationship to Applicant (spouse, child, etc.): _____
Date of Birth (mm/dd/yyyy): _____
Place of Birth (city and country): _____
Nationality (listed on passport): _____ Sex: _____
Passport Issued: ☐ No ☐ Application Pending ☐ Yes, Expiration Date: _____
Issuing Country: _____

Name *(*family name, given name, middle initial): _____
Relationship to Applicant (spouse, child, etc.): _____
Date of Birth (mm/dd/yyyy): _____
Place of Birth (city and country): _____
Nationality (listed on passport): _____ Sex: _____
Passport Issued: ☐ No ☐ Application Pending ☐ Yes, Expiration Date: _____
Issuing Country: _____

Name *(*family name, given name, middle initial): _____
Relationship to Applicant (spouse, child, etc.): _____
Date of Birth (mm/dd/yyyy): _____
Place of Birth (city and country): _____
Nationality (listed on passport): _____ Sex: _____
Passport Issued: ☐ No ☐ Application Pending ☐ Yes, Expiration Date: _____
Issuing Country: _____

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Applicant Last Name: Mentor Last Name:

Part VI—Applicant's Research Proposal

Add an additional page if more space is needed.

1. Proposed Length of Fellowship: ☐ 12 months ☐ 24 months

2. Fellowship Goals—Provide a 50-word summary of your goals for the fellowship.

3. Research Proposal Title

4 . Research Proposal Abstract—Limit your abstract to 250 words.

5. Selection of Mentor and Institution.
   Explain why you selected this mentor and institution to accomplish your research goals. Describe the key factors in your selection. Include information about research opportunities the institution and mentor offer that may not be available in your home country.

6. Applicant's Full Research Proposal.
   Your Research Plan may not exceed three pages not including literature citations. Describe the proposed Research Plan, including:
   a) Specific aims
   b) Background and significance
   c) Research design and methods
   d) Compliance with the applicable legal and regulatory requirements on the conduct of research at the mentor's institution
   e) Literature citations (Each citation must include the authors' names, book or journal titles, volume number, page numbers, and year of publication.)

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Part VII—Mentor's Personal History

Add an additional page if more space is needed.

1. Education (Begin with baccalaureate or other initial professional education, such as nursing, and include any postdoctoral training.)

   a) Name and Location of Institution: _____
   Degree: _____
   Year Conferred: _____
   Field of Study: _____

   b) Name and Location of Institution: _____
   Degree: _____
   Year Conferred: _____
   Field of Study: _____

   c) Name and Location of Institution: _____
   Degree: _____
   Year Conferred: _____
   Field of Study: _____

   d) Name and Location of Institution: _____
   Degree: _____
   Year Conferred: _____
   Field of Study: _____

2. List your most significant publications, honors, awards, or other accomplishments, including current membership on a Federal Government public advisory committee.

3. How many pre- and postdoctoral fellows have you trained?

4. For a representative five of the trained pre- and postdoctoral fellows, please list their names and fellowship training dates, current employer, and position titles.

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Part VIII— French Applicant: Mentor's Research and Training Support

Add an additional page if more space is needed.

☐ Not applicable for U.S. Applicant

The U.S. mentor should be a NICHD researcher whose project will be active throughout the fellowship period Please list all currently active NICHD grants or studies. Also include all applications and proposals currently pending review or award whether related to this application or not. If any information changes after submission, immediately notify the NICHD Office of Education.

Grant Source and Identifying Number: _____ ☐ Active ☐ Pending
Grant Project Title: _____
Principal Investigator: _____
Project Officer: _____
Mentor's Role on Grant Project: _____
Percentage of Effort: _____
Award Date: _____
End Date (including no-cost extensions): _____
List specific aims of grant project. _____
Will applicant work under this grant project? _____

Grant Source and Identifying Number: _____ ☐ Active ☐ Pending
Grant Project Title: _____
Principal Investigator: _____
Project Officer: _____
Mentor's Role on Grant Project: _____
Percentage of Effort: _____
Award Date: _____
End Date (including no-cost extensions): _____
List specific aims of grant project. _____
Will applicant work under this grant project? _____

Grant Source and Identifying Number: _____ ☐ Active ☐ Pending
Grant Project Title: _____
Principal Investigator: _____
Project Officer: _____
Mentor's Role on Grant Project: _____
Percentage of Effort: _____
Award Date: _____
End Date (including no-cost extensions): _____
List specific aims of grant project. _____
Will applicant work under this grant project? _____

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Part IX—Mentor's Statement
Add an additional page if more space is needed.

Mentor's Statement—Submit your statement by utilizing the space below. Your statement may not exceed five pages. Your statement should include the following:

1. Describe the Research Plan for the applicant. Include such items as seminars and opportunities for interaction with other groups and scientists. Describe the research environment, available research facilities and equipment, and research support the mentor will make available to the applicant during the fellowship. Include information that will help reviewers evaluate the applicant and the proposed research project. Indicate the relationship of the proposed research to the applicant's career goals. Describe the skills and techniques that the applicant will learn and relate these to the applicant's career goals.
2. How many predoctoral and postdoctoral fellows/trainees will be supervised during the fellowship?
3. Describe the applicant's qualifications and potential for a research career.
4. Please assess the feasibility of the Research Plan with respect to current National Institutes of Health (NIH) or Inserm regulations on the conduct of research.
5. Please confirm the applicant has read and understands the U.S. or French guidelines regarding the conduct of research and agrees to comply with all NIH, Inserm, and other institutional requirements.

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Part X—Sponsoring Institution Certifications and Assurances

1. Human Subjects: ☐ No ☐ Yes

   If Yes, List Exemption Number or IRB Approval Date: _____

   If Yes, List Assurance of Compliance Number: _____

2. Vertebrate Animals: ☐ No ☐ Yes

   If Yes, List IACUC Approval Date: _____

   If Yes, List Animal Welfare Assurance Number: _____

- Funds paid to a NICHD-funded researcher's sponsoring institution under a NICHD–Inserm Fellowship award are considered Federal financial assistance to that organization and must comply with the same U.S. Federal regulations, policies, guidelines, and review considerations as do all NIH research project grant applications.
- Accordingly, the individual signing the NICHD–Inserm Fellowship application as the Official ***Signing for Sponsoring Institution*** is certifying that the sponsoring institution and its principals will comply with all NIH as well as Inserm terms and conditions. This signing official must be a separate individual from the mentor.
- In addition, by signing below, the ***mentor*** agrees to accept responsibility for the scientific conduct of any research conducted as a result of a NICHD–Inserm Fellowship award and to comply with NIH, Inserm, and institutional regulations.
- For a complete discussion of the NIH regulations, consult the NIH Grants Policy Statement at http://grants.nih.gov/grants/policy/nihgps_2010/index.htm or Part III, Section 2 of the *U.S. Department of Health and Human Services, Public Health Service Grant Application, PHS 398 Instructions*, http://grants2.nih.gov/grants/funding/phs398/phs398.html.
- Any research conducted at NICHD or NICHD-funded institutions as a result of a NICHD–Inserm Fellowship award must comply with all NIH policies on:

  Research Using Human Embryonic Stem Cells
  Human Subjects
  Lobbying
  Women and Minority Inclusion Policy
  Inclusion of Children Policy
  Vertebrate Animals
  Debarment and Suspension
  Recombinant DNA and Human Gene Transfer Research
  Research on Transplantation of Human Fetal Tissue
  Non-delinquency on Federal Debt
  Research Misconduct
  Civil Rights (Form HHS 690)
  Handicapped Individuals (Form HHS 690)
  Sex Discrimination (Form HHS 690)
  Financial Conflict of Interest
  Age Discrimination (Form HHS 690)
  Drug-Free Workplace

- Any research conducted at Inserm as a result of a NICHD–Inserm Fellowship award must comply with all the internal as well as French and European applicable policies.

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Part X—Sponsoring Institution Certifications and Assurances

CERTIFICATION: We, the undersigned, certify that (a) the information herein is true and complete to the best of our knowledge; (b) if this application results in an award for a research fellowship, appropriate training, adequate facilities, and supervision will be provided; and (c) we accept the obligation to comply with the NIH and Inserm terms and conditions of the fellowship award. We are aware that any false, fictitious, or fraudulent statements or claims may subject us to criminal, civil, or administrative penalties.

MENTOR

Mentor's Name: _____

Email:

_____

Office Telephone: _____

Signature_____Date_____

DEPARTMENT HEAD OF SPONSORING INSTITUTION OR DIRECTOR OF THE HOSTING RESEARCH CENTER OF INSERM (must be different than mentor)

Department Head or Director Name:

_____

Email:

_____

Office Telephone: _____

Signature_____Date_____

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Inserm

NICHD–INSERM Scholar Program

List of Inserm's Host Laboratories and Research Programs

1. Sebastian AMIGORENA, sebastian.amigorena@curie.fr

Research Interest:

https://science.curie.fr/recherche/biologie-interactive-des-tumeurs-immunologie-environnement/immunite-et-cancer/

Laboratory:

Dr Ana-Maria LENNON-DUMENIL Directeur de Recherche/Research Director Institut Curie/U932 Inserm 12, rue Lhomond 75005, Paris, France Tel: (33)1-56-24-64-27 **Ana-Maria.Lennon@curie.fr**	Institut Curie Inserm Unit 932 IMMUNITY AND CANCER 26 RUE D'ULM CNRS/UMR 3215 75248 PARIS CEDEX 05 France	Clotilde THÉRY Claire HIVROZ Philippe BENAROCH Vassili SOUMELIS Nicolas MANEL Olivier LANTZ

2. Ludger JOHANNES, ludger.johannes@curie.fr

Research Interest:

In the Endocytic Trafficking and Intracellular Delivery team we study the cell biology of carbohydrate-binding proteins (lectins) in the context of cellular entry though clathrin-independent endocytosis, retrograde sorting on early endosomes, and membrane translocation to the cytosol. We hypothesize that certain lectins link glycosylated cargo proteins and glycosphingolipids into molecular nanoenvironments from which endocytic pits are formed in a process that is independent of the cytosolic clathrin machinery. Our current efforts are geared at unraveling the mechanistic and functional framework of this novel concept in membrane biology, notably also using chemical biology tools to rebuild this process (synthetic biology). Another focus of our work is based on our pioneering discovery of the early endosomes — TGN retrograde trafficking interface. We now analyze possible molecular and functional links between endocytic sorting at the plasma membrane and retrograde sorting on early endosomes. Finally, we explore the process of endosomal escape to the cytosol from a mechanistic and biomedical perspective in an attempt to device innovative strategies of therapeutic delivery and immunotherapy for the treatment of tumor pathologies.

Laboratory:

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3. Marie-Hélene VERLHAC marie-helene.verlhac@college-de-france.fr **& Marie-Emilie TERRET**

Research Interest: Oocyte Mechanics and Morphogenesis

We study the last stages of murine oogenesis, a process that terminates with the production of functional female gametes required for sexual reproduction. The last step of oogenesis, named meiotic maturation, corresponds to two successive asymmetric divisions without intervening DNA replication. Mammalian meiotic maturation takes place at puberty under periodical hormonal influence. It can be reproduced and followed *in vitro* on synchronized population of cells. Oocytes are gigantic cells, up to 1000 times larger than most somatic cells, neuron excepted. Oocyte meiotic divisions are extremely asymmetric in size of the daughter cells, which allows the preservation of maternal stores required for embryo development. Oocytes have thus to accomplish two opposite tasks: segregate their chromosomes equally while partitioning their cytoplasm unequally. Furthermore this tour de force is challenged by the lack of canonical centres of microtubule nucleation, namely centrosomes containing a pair of centrioles. Canonical centrosomes of mitotic cells organize spindle as well as astral microtubules at spindle poles, mediating spindle positioning. During the last 5 years, we have identified mechanisms regulating the positioning of meiotic chromosomes in the absence of canonical centrosomes, processes that might have their share in the innate susceptibility of the female gamete to produce errors in chromosome segregation. We aim at understanding the impact of actin meshes in the control of chromosome positioning and on the developmental potential of the oocyte. For this we use interdisciplinary approaches combining cell biology, genetics, biophysics as well as bio-informatics.

Laboratory:

Marie-Hélene VERLHAC CIRB - Center for Interdisciplinary Research in Biology CNRS/UMR 7241 - INSERM U1050 Collège de France 11, Place Marcelin Berthelot 75231 Paris Cedex 05 - France http://www.college-de-france.fr/site/en-cirb/index.htm	**Marie-Emilie TERRET** https://www.college-de-france.fr/site/en-cirb/Terret-Verlhac.htm

4. Dr François HACHE, francois.hache@polytechnique.edu

Research Interest:

The Laboratory for Optics and Biosciences gathers biologists and physicists to come up with new investigation techniques on relevant biophysical issues. Among the research activities of the laboratory, let us cite the "Advanced microscopy and tissue physiology" group which develops novel experimental approaches based on a solid expertise in nonlinear optics and in tissue microscopy. The aim is to study *in situ* the links between cell physiology and tissue adaptation in contexts such as embryo morphogenesis, nervous system development, and extracellular matrix remodeling. Two complementary aspects are pursued (i) method developments / proof-of-principle studies, and (ii) their application to novel biomedical issues, through an active collaboration network. Another group "Nano-imaging : cell dynamics and quantitative biology" focusses on the investigation of cell dynamics using nano-imaging tools that include nanolabels and nanosensors for controlled cell stimulation. They study spatio-temporal organization of signaling pathways, in the membrane organization and its role in signaling.

Laboratory:

Dr François HACHE Laboratory for Optics and Biosciences Ecole Polytechnique, 91128 Palaiseau - France Tel (+33) 1 69 33 50 39 https://portail.polytechnique.edu/lob/en	Emmanuel BEAUREPAIRE Cédric BOUZIGUES

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NICHD–INSERM Scholar Program

5. Bertrand SERAPHIN, directeur.igbmc@igbmc.fr

Research Interest:
The Institute of Genetics and Molecular and Cellular Biology (IGBMC), located in the Strasbourg Eurométrople, is now one of the main European research centers in biomedical research and the largest French research unit associated to the Inserm. The IGBMC is structured around 4 scientific departments, and provides high-level support to research teams through advanced scientific services and technological platforms. The Institute develops interdisciplinary research at the interface of biology, biochemistry, physics and medicine,

Among the research lines developed at IGBMC, analyses of early development and the deciphering of cellular functions are addressed by several teams. Several model organisms including mouse, drosophila, *C. elegans*, yeast as well as cultured mammalian cells serve as a basis for these analyses. The use of mice is particularly developed thanks to the location on site of the Mouse Clinical Institute, a main European facility for mice genetic engineering and standardized functional analysis. The institute as a recognized expertise in analyzing development and high-level imaging techniques.

Additional facilities including an internationally recognized Imaging center, including advanced optical imaging, high-resolution electron microscopy and image analyses, facilitates the work of research teams. Further information on the institute, the team's scientific projects and support facilities is available on the web site: http://www.igbmc.fr/

Laboratory:

IGBMC - Institut de Génétique et de Biologie Moléculaire et Cellulaire IGBMC - CNRS UMR 7104 - Inserm U 1258 1 rue Laurent Fries / BP 10142 / 67404 Illkirch CEDEX / France http://www.igbmc.fr/research/	All teams of the IGBMC working in the target area are eligible (http://www.igbmc.fr/research/), Please, contact the IGBMC direction that will initiate interaction with teams of interest.

6. Pierre HAINAUT, pierre.hainaut@univ-grenoble-alpes.fr**; Corinne ALBIGES-RIZO**, corinne.albiges-rizo@univ-grenoble-alpes.fr

Research Interest:
Understanding how cells integrate or adapt multiple signaling spatio-temporal patterns to orchestrate cell plasticity and to achieve specific cell differentiation and tissue specification is our challenge. Whether the specificity of cell reprogramming or differentiation is determined by the spatiotemporal dynamics of receptors need to be investigated. We are exploring the spatial-temporal coordination between growth factor receptors and adhesive receptors. The study of such dynamics relies on synthetic biology which offers spatiotemporal resolution and which is often required to mimic biological processes that are dynamic and local. The challenge of the program is to survey dynamic and spatial aspect of communication between adhesive receptors and growth factor receptors to drive cell reprogramming and cell identity by reconstituting cell dynamics with synthetic biology. Synthetic biology relies on the use of a broad range of molecular tools that enable the real-time manipulation and measurement of key components in the underlying signaling pathways. We will focus on a subset of synthetic biology tools that enable the manipulation of biomolecules with subcellular resolution by using technologies such as optogenetics, biosensors and bioengineered biomaterials to reconstitute cellular

behavior in cells and analyze biological processes in space and time. Considering the properties and behavior of the transcriptome and proteome as integrated systems, transcriptomic and mass spectrometry will be utilized to explore the cell identity transcriptome and proteome as functions of ligand patterning and receptor dynamics. Our technical decisions are based on interdisciplinary approaches combining expertise in biomaterials, cell biology, cell imaging, biophysics and bioinformatics.

Laboratory:

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7. Stéphane NOSELLI, noselli@unice.fr

Institute (http://ibv.unice.fr)
The 'institut de Biologie Valrose, iBV' is a leading Biology institute located on the French Riviera in the heart of the Nice city. It gathers 28 teams (http://ibv.unice.fr/research-team/) working on main model organisms and addressing major biological questions (Developmental Biology, Cell Biology, Biophysics, Signalling) in normal and pathological conditions. iBV is an internationally recognized institute (English is the working language; 25 different nationalities hosted) with state-of-the-art facilities.
See our Job Offers: http://ibv.unice.fr/job-careers/job-offers/
Research Projects: http://ibv.unice.fr/research-team/noselli/
→ *Funding for 3 years Postdoc and 3 years PhD*

Research Interest: New genes and mechanisms controlling Left-Right asymmetry in Drosophila
Breaking left-right (LR) symmetry in Bilateria embryos is a major event in body plan organization. Both in vertebrates and invertebrates, the establishment of LR asymmetry is essential for handedness, directional looping of internal organs (heart, gut...) and differentiation of the heart and brain. Abnormal LR patterning during embryogenesis leads to a number of defects and syndromes including congenital heart diseases, spontaneous abortion, asplenia, polysplenia, Kartagener and Ivemark syndromes etc.
Our laboratory pioneered the study of LR asymmetry in Drosophila and identified several major genes controlling organ looping and LR morphogenesis, including the conserved *Myosin1D* gene (*Myo1D*), whose function is conserved in vertebrates.
Our current work addresses two mains questions:

1. What is the role of actin regulators in controlling Myo1D and visceral organ laterality? How does Myo1D controls multiscale asymmetry, from molecular to behavioural? To address these questions, we combine genetics, biochemistry and cell biology to identify key actin regulators and their function in tissue organizers. This work will help establish the fundamental role played by actin and its regulators in organ and body polarity.

2. Identify the first genes involved in Brain LR asymmetry. Nervous system asymmetry is essential for brain function and defects in laterality are related to several pathologies in human (schizophrenia, autism, memory, etc..). However, the genetic nature of these function/defects remains unknown. We are currently developing a novel approach to identify the first genes and pathways controlling the asymmetry of some specific asymmetries in the adult brain of Drosophila. Candidates genes (conserved in vertebrates) are currently under characterization. This work will pave the way to better understand the basis of brain

asymmetry and how laterality genes are conserved across phyla.

Laboratory:

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8. Chantal VAURY-ZWILLER, chantal.vaury@uca.fr

In the Gred (Génétique Reproduction & Développement**) Research unit,** the biological questions aim at understanding how a living organism develops and how, following a well-orchestrated genetic and epigenetic program, deregulations can occur and lead to various pathologies.

1. **Research Interest of Claire CHAZAUD team:**
Our team is interested in deciphering the molecular mechanisms regulating one of the first cell differentiation event that takes place in the embryo: the binary specification of epiblast (Epi) and Primitive Endoderm (PrE) within the Inner Cell Mass of the blastocyst during preimplantation. This developmental program requires the concerted action of sequence-specific transcription factors and cell signalling during blastocyst development.

In the past years we have shown the interplay between different transcription factors such as Nanog for the Epiblast and Gata6, Sox17, Gata4 for the PrE. We are now looking at upstream and downstream mechanisms regulating these differentiations. We use embryos and stem cells with different techniques and tools (Single-cell RNA analysis, FISH, Immunofluorescence, live imaging, mouse transgenesis...)

These findings have an important impact in stem cell biology, as embryonic stem cells (ES) are derived from blastocysts.

2. **Research Interest of David Volle team:**
Over the past years, our research programs have focused on the impact of endocrine and metabolism defects on testicular undifferentiated germ cell physiology regarding specific transgenerational imprinting that may lead to inherited developmental health disorders. By taking advantage of established cell lines and from genetically engineered mice as well as *C. elegans* approaches, we are now addressing the molecular mechanisms that underline these transgenerational effects with an impact on progenies. This might help us to better characterize how, according to our previous work, signaling molecules such as bile acids or endocrine disruptors alter germ cell homeostasis and thus leads to transgenerational transmission of developmental defects.

Laboratory:

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9. Centre de Psychiatrie et Neurosciences CPN, Paris

3 PI: Alessandra PIERANI, Guillaume VAN NIEL, & Cyril HANUS

- **Alessandra PIERANI,** alessandra.pierani@inserm.fr

Research Interest:

http://www.institutimagine.org/en/research/25-research-labs/259-genetics-and-development-of-the-cerebral-cortex.html

Cognitive functions depend on the precise construction of complex neural circuits which begins during early embryonic development.

Our work has shown that proper cortical development depends on the action of different cell types that are transiently present during the construction of neural circuits. An increase in both number and diversity of transient neurons might represent an evolutionary addition to wire higher-order cortical areas in the cerebral cortex and to increase vertebrate brain complexity and cognitive function. We reported that variations in their migration speed during early development, or of their death at the end of corticogenesis have profound consequences on the neural circuits. These transient signalling neurons express at high levels genes whose mutations have been associated with neurological and psychiatric disorders.

By coupling studies on the function and dysfunction of transient neuron development in mice and primates, our future projects aim at linking developmental neuroscience with evolution and pathology in humans. In particular, they aim at i) molecularly dissecting how transient migratory neurons serve as organizers in neocortical development, ii) determining how the acquisition of these neurons in mammals has contributed to the evolution of the neocortex and iii) testing how manipulating their number, migration and survival affects neural circuits in mouse models and may lead to pathological conditions. We employ a multidisciplinary approach including mouse genetics, phenotyping using behavioural tests, pharmacological and genetic manipulation during embryogenesis (in utero electroporation), together with transcriptome profiling, and migration studies using single-cell resolution and time-lapse microscopy.

Our projects span from early onset cortical malformations to susceptibility to later-onset diseases characteristic of psychiatric illnesses. We have joined two complementary institutes to develop this translational project in collaboration with neuroscientists, human geneticists and clinicians.

Laboratory:

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- **Guillaume VAN NIEL,** guillaume.van-niel@inserm.fr

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Research Interest:

The various molecular mechanisms that regulate the endosomal system, in particular lysosomal degradation and exosome secretion have been recently involved in several neuropathies such as glioblastoma progression and development of Alzheimer's Disease. We aim to understand the conserved mechanisms that regulate the balance between lysosomal degradation and exosomes secretion and to unveil the biology of exosomes in vivo. To this end, we are applying a series of advanced state of the art

imaging methods: light microscopy, electron microscopy, correlative light electron-microscopy, which we combined to opto-genetics in cellular model and in zebrafish as model organism in order to:
1. Track and analyze exosomes secretion, journey, fate and function in vivo at the vesicle scale in zebrafish models.
2. Dissect the mechanisms regulating late endosomal dynamics by focusing on the balance between lysosomal degradation and exosomes secretion as clearance mechanisms in Alzheimer Disease
3. Understand the role membrane contact sites during endosomal maturation and endosomal functions.
By exploring the mechanisms of clearance and cellular communication at different time-scales and length-scales should advance the understanding of the relevance of the endosomal system in various neuropathies.

Laboratory:

Dr Guillaume van Niel Directeur de Recherche/Research Director Centre de Psychiatrie et Neurosciences, U894 INSERM 102 rue de la Santé, 75014, Paris, France Tel: (33)1-56-24-64-27	Frederic Verweij

- **Cyril HANUS,** cyril.hanus@inserm.fr

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Research Interest

Neuronal development and synaptic transmission require the continuous production of secreted trophic factors and transmembrane proteins such as adhesion proteins, neurotransmitter receptors, ion-channels, and thus heavily rely on the secretory machinery: the endoplasmic reticulum (ER) and the Golgi apparatus (GA), where these proteins are synthesized and, in most cases, chemically modified by addition of complex sugars during N-glycosylation. N-glycosylation is the second most frequent protein post-translational modification after phosphorylation and regulates every aspect of the biology of membrane proteins, in particular their trafficking to the cell-surface and their stability. Congenital N-glycosylation defects, especially in brain, result in usually lethal developmental disorders, while milder forms lead to mental retardation. Despite a likely central role in neurons, strikingly little is known on the N-glycosylation of neuronal proteins.

Our recent work shows that, as a result of Golgi independent trafficking and presumably local protein synthesis in dendrites, hundreds of key *surface-expressed* proteins, notably neurotransmitter receptors, display glycosylation profiles that are typically associated with immature proteins before their export to the cell surface. This so-called core-glycosylation is associated with a faster protein turnover and is regulated by synaptic activity, unraveling a novel mechanism controlling the electrical and chemical sensing properties of the neuronal membrane.

Our team uses a broad cast of advanced imaging (live single molecule tracking, single synapse stimulation, correlative live - STED microscopy), biochemical techniques (glycomics, cell type specific proteomics) in mouse and rat neurons and brain slices. Our specific aims for the short and midterm future are: 1) to assess the contribution of unconventional N-glycans to dendritic growth and synaptic signaling; and 2) to determine the impact of local protein synthesis on the N-glycosylation, surface expression, stability and regulability of synaptic proteins during synaptic plasticity.

Laboratory:

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