BIOGRAPHICAL SKETCH

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NAME	POSITION TITLE
Brice Gaudilliere, MD, PhD	Clinical Instructor & Postdoctoral Fellow, Department of Anesthesia
eRA COMMONS USER NAME (credential, e.g., agency login) BGAUDILLIERE	

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
Lycée Louis le Grand, Paris, France	Baccalaureate C	06/94	Math and Physics
Ecole Polytechnique, Paris, France	BS	07/00	Engineering
Harvard Medical School, Boston, MA	PhD	06/05	Neurobiology
Harvard Medical School, Boston, MA	MD	06/09	Medicine
Santa Clara Valley Medical Center, San Jose, CA	Internship	06/10	Medical/Surgical
Stanford University, Stanford, CA	Residency	06/13	Anesthesiology

A. Personal Statement

My overall career goal is to become an independent investigator focusing on translational research in the field of perioperative immunity. The goal of the proposed research is to improve recovery from surgery via single-cell analysis of signaling networks that govern the human immune response to surgical trauma. Specifically, we plan to investigate the role of a subset of macrophages, the Surgery-Induced Myeloid Cells (SiMCs), in modulating the adaptive immune system in patients undergoing total hip arthroplasty (THA). Using a novel multi-parameter mass cytometry platform, we will monitor with single cell resolution signaling mechanisms that regulate the immune response to surgery as they occur *in vivo* in patients undergoing THA. We also propose a first interventional clinical study to characterize at the level of the entire immune system the immune-modulatory effect of L-arginine supplementation, an intervention known to reduce the risk of infections and length of hospital stay in surgical patients.

As an anesthesiologist, I am responsible for the care of patients as they go through one of the most stressful experiences in their lifetime. Through my clinical experience, I developed a strong interest in understanding a patient's ability to recover from the profound inflammation triggered by surgery. My strong educational background in science and engineering and my research experience in biochemistry and signaling biology have enabled a smooth transition from my previous work in molecular neurobiology to studying human systems immunology. This combined training as a physician scientist has provided me the knowledge and leadership qualities necessary to complete the proposed work.

The goal of the proposed K23 career development award is to support research training in human immunology, mass cytometry, and surgical outcomes research. During the research phase of my anesthesiology residency, I became the project leader of a collaborative effort between Dr. Garry Nolan's and Dr. Martin Angst's laboratories. We established the reproducibility and sensitivity of mass cytometry to detect changes in immune signaling networks in patients undergoing THA (*manuscript in preparation*). This well-developed, ongoing multi-disciplinary collaboration among immunologists, computational biologists, and anesthesiologists will be the foundation for the proposed research project. As an early stage investigator, I have selected a team of mentors with expertise relevant to both my research and training plan. With their mentoring and guidance, this award will form the groundwork for an independent research career aimed at identifying immune traits predicting surgical outcomes, including recovery, wound healing, infection, or organ

dysfunction. A specific focus in my future work will reside on elucidating the role of SiMCs in modulating the immune response to surgery and altering the course of postoperative recovery.

B. Research and/or Professional Experience

Employment

09/1997-09/1998	Watch Officer (Lieutenant), French Navy; full-time, non-tenure; Supervisor: C^{dt} Francois Moreau
07/2005-07/2007	Postdoctoral Fellow, Department of Pathology, Harvard Medical School, Boston, MA; full-time, non-tenure; Supervisor: Azad Bonni
07/2010-07/2013	Fellowship in Anesthesia Research and Medicine, Department of Anesthesia, Stanford University, Stanford, CA; Full-time, non-tenure; Supervisor: Martin Angst
07/2013-Present	Postdoctoral Fellow, Department of Anesthesia, Stanford University, Stanford, CA; Full-time, non-tenure; Supervisors: Garry Nolan/Martin Angst
07/2013-Present	Clinical Instructor, Department of Anesthesia, Stanford University, Stanford, CA; Part-time, non-tenure; Department head: Ron Pearl

Honors

2000	Carnot Foundation Scholarship, Ecole Polytechnique, Paris, France
2000	George Lurcy Fellowship, Harvard University, Boston, MA
2004	Albert J. Ryan Fellowship, Harvard University, Boston, MA
2008	Centre National des Etudes Spatiales (CNES; National Center for Space Studies) Award
2010	Fellowship in Anesthesia Research and Medicine
2011 & 2012	Stanford Society of Physician Scholars Award
2013	International Anesthesia Research Society (IARS) Best Critical Care Abstract
2013	Kosaka Award for Best Scientific Presentation, IARS
2013	Stanford Anesthesia Department FARM Fellow Best Research Award

Professional Societies

2010-	American Society of Anesthesiology (ASA), member
2010-	Stanford Society of Physician Scholars, elected member
2011-2012	European Society for Anesthesia, member
2012-	International Anesthesia Research Society, member

C. Publications

1. de la Torre-Ubieta L, Gaudillière B, Yang Y, Ikeuchi Y, Yamada T, DiBacco S, Stegmüller J, Schüller U, Salih D, Rowitch D, Brunet A, Bonni A. A FOXO-Pak1 Transcriptional Pathway Controls Neuronal Polarity. *Genes and Development.* 2010 Apr 15;24(8):799-813. PMCID: PMC 2854394.
2. Shalizi A, Bilimoria PM, Stegmüller J, Gaudillière B, Yang Y, Shuai K, Bonni A. PIASx is a MEF2 SUMOE3 ligase that promotes postsynaptic dendritic morphogenesis. *J. Neurosci*. 2007 Sep 12;27(37):10037-46. PMID: 17855618.
3. Ramos B, Gaudillière B, Bonni A, Gill G. Transcription factor Sp4 regulates dendritic patterning during cerebellar maturation. *Proc Natl Acad Sci U S A*. 2007 Jun 5;104(23):9882-7. PMID: 17535924.
4. Shalizi A†, Gaudillière B† (co-first authors), Yuan Z, Shirogane T, Stegmüller J, Ge Q, Tan Y, Schulman B, Harper W, Bonni A. A Calcium-Regulated MEF2 Sumoylation-Acetylation Switch Controls Postsynaptic Dendritic Morphogenesis. *Science*. 2006 Feb 17;311(5763):1012-7. PMID: 16484498.
5. Gaudillière B, Konishi Y, De la Iglesia N, Yao G, Bonni A. A CaMKII-NeuroD signaling pathway specifies dendritic morphogenesis. *Neuron.* 2004 Jan 22;41: 229-241. PMID: 14741104.
6. Shalizi A, Lehtinen M, Gaudillière B, Donovan N, Han J, Konishi Y, Bonni A. Characterization of a neurotrophin signaling mechanism that mediates neuron survival in a temporally specific pattern. *J. Neurosci.* 2003 Aug 13;23(19):7326-36. PMID: 12917366.
7. Gaudillière B, Shi Y, Bonni A. RNA interference reveals a requirement for myocyte enhancer factor 2A in activity-dependent neuronal survival. *J Biol Chem*. 2002 Nov 29;277(48):46442-6. PMID: 12235147.

D. Recent Abstracts and Presentations

1. “Systems Immunology Reveals Massive Expansion of Myeloid Derived Suppressor Cells in Patients Undergoing Surgery.” Brice Gaudilliere, Gabriella Fragiadakis, Martin Angst, Garry Nolan. American Society of Anesthesiology (October 2013).
2. “Single-cell Mass Cytometry Reveals a Highly Structured Cellular Immune Response in Patients with Surgical Trauma.” Brice Gaudilliere, Gabriella Fragiadakis, Martin Angst, Garry Nolan. Frontiers of Single Cell Analysis Conference (September 2013).
3. “Mass Cytometry Reveals an Endogenous Immune Response to Physiological Perturbation in Humans.” Brice Gaudilliere, Gabriella Fragiadakis, Martin Angst, Garry Nolan. CYTO 2013 Annual Meeting (May 2013).
4. “System-Wide Analysis of the Endogenous Immune Response to Surgical Trauma Using Mass Cytometry (CYTOF).” Brice Gaudilliere, Gabriella Fragiadakis, Martin Angst, Garry Nolan. International Anesthesia Research Society Annual Meeting (May 2013).
5. "Phospho-flow cytometry reveals a direct modulation of the ERK-MAPK pathway by morphine in human monocytes: application of multi-parameter cytometry to study immune signaling networks in humans." Brice Gaudilliere, Martin Angst, Garry Nolan. European Society for Anesthesia Annual Meeting (June 2012).
6. "Phospho-flow cytometry reveals a direct modulation of the ERK-MAPK pathway by morphine in human monocytes.” Brice Gaudilliere, Martin Angst, Garry Nolan. Western Anesthesia Residents Conference (May 2012).

E. Research Support

Ongoing Research Support

T32 GM089626 Giffard (PI) 07/01/2013-06/30/2015
NIH, NIGMS
Anesthesia Training Grant in Biomedical Research
The objective of the Anesthesia Training Program in Biomedical Science is to train leaders in academic anesthesia.
Role: Post-doctoral Fellow