# Society on NeuroImmune Pharmacology
# Early Career Investigator Survey Results

This survey was conducted to assess the level of satisfaction of Early Career Investigators within the field of NeuroImmune Pharmacology (NIP). Our intent was to gauge how happy and hopeful these young investigators are about the future of research in this field. We also wanted to know whether or not these young members feel that they are well-connected to, and represented by the Society on NeuroImmune Pharmacology (SNIP), and whether they are poised to step into leadership roles in the future. In addition, we were looking for new perspectives on how we can change or improve the current trajectory of SNIP in order to meet the expectations of Early Career Investigators. We also sought to initiate a discussion on these survey results by seeking comments from academic leaders in the field of NeuroImmune Pharmacology. Their thoughts are included within this report, highlighted together with the corresponding survey data.

This survey was administered by Dr. Michelle Kiebala, a Postdoctoral Research Associate in the Department of Microbiology and Immunology, University of Rochester. Michelle graduated with her Ph.D. from the University of Rochester in December 2010. Michelle's research currently focuses on the role of NF-κB proteins in mediating neuroinflammatory processes during HIV infection. She intends to pursue a career in academic research and remain focused on the neurological complications of viral infections, such as HIV. Michelle is a current SNIP member and has received travel awards for attending two SNIP conferences, in Wuhan, China and Manhattan Beach, CA. She enjoys the small, focused nature of the SNIP community and is excited about the future of NIP research, particularly the development of therapeutics for neuroinflammation.

**Sanjay B. Maggirwar, Ph.D.**
Communications Committee Chair, SNIP.

## Introduction

In order to get a feel for the future of NeuroImmune Pharmacology (NIP) as a field, we designed a survey targeting Early Career Investigators (ECI) in the Society on NeuroImmune Pharmacology (SNIP). This category includes postdoctoral researchers, instructors, research assistant professors, and assistant professors. The survey was sent via email as a link to an online SurveyMonkey® questionnaire in January, 2012. Because of this format, the responses we received were completely anonymous. Out of 149 registered SNIP members, 68 are considered ECI. We received 51 responses (75% of ECI members) to the survey, which is an excellent participation level.

### Questions

**1.** How long have you been studying Neuroimmunepharmacology (NIP)?
**2.** Are your studies funded by the National Institutes of Health (NIH), and if so, are you the PI of any related grant(s) from the NIH?
**3.** Which journals primarily provide you with information about advances in NIP, and is such information supportive of your research?
**4.** Are you publishing your research findings in the Journal of NeuroImmune Pharmacology (JNIP) that serves as the official journal of the Society on NeuroImmune Pharmacology (SNIP)? Do you think that this journal provides you with novel insights in the topic area of NIP? Does the journal serve as an appropriate forum for increasing the visibility of your research in the NIP community?
**5.** Are you excited about the advances in NIP research (and its pace) in camparison with those in broader parental fields, including neurology, immunology and pharmacology?
**6.** To which important avenues would you like to see the NIP field progress by 2020?
**7.** What do you think of the job prospects for you in the NIP field, and where do you see your standing in the NIP community by 2020?
**8.** What are your suggestions as to how we may further address under-represented issues and increase group diversity participation at the SNIP conferences?
**9.** (Optional) Please indicate your race/ethnicity _____ and sex _____.
**10.** Please share with us your suggestions or additional comments.

***Howard Fox:*** *One distinct strength of SNIP is the involvement and nurturing of Early Career Investigators (ECI) in the field. In fact a high proportion of our members span the range from post-doctoral researcher to assistant professors. They are of course crucial not only for the future of neuroimmune pharmacology (NIP) but the advancement of our knowledge in biomedicine in general. In order to help the society meet the needs of ECI Dr. Michelle Kiebala of the University of Rochester conducted a survey of ECI in SNIP. The demographics of ECIs are nicely represented in her survey, and points to a low proportion of women (36%) and African Americans (9%) or Hispanics (5%). Increasing the participation of under-represented groups in the SNIP membership and meetings is an important goal, and the leadership needs to keep this a priority while increasing the overall membership in SNIP.*

***Brian Wigdhal:*** *The first impression we have is that the Survey did a wonderful job of capturing the pulse of early career investigators with respect to their views of the Society, the official Journal of the Society, the Journal of Neuroimmune Pharmacology, their feelings about the field in general, and perhaps most importantly their perceptions and impressions of where the field is going and whether there is room for bright, enthusiastic, creative, and hardworking Early Career Investigators to help take the field to a new level over the upcoming years.*

***Jag Khalsa:*** *For any scientific organization that supports multidisciplinary researchers, it is important to establish a training program for mentors and mentees, with goals, milestones, and standard yardsticks. With regard to new and early career investigator training program, SNIP does it well.*

***Harris Gelbard:*** *The results in this survey are, in general, very encouraging for the growth of SNIP, as leadership looks forward to the next generation of SNIP investigators.*

## Results

As shown in **Figure 1**, the vast majority of participants in the survey have been studying NIP for 1-10 years. **Figures 2 and 3** show the demographics (sex and race/ethnicity) of survey responders.

**Figure 1**
**Time Studying Neuroimmunepharmacology (51 responses)**

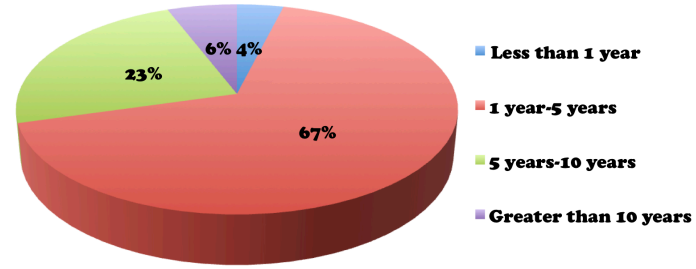



**Figure 2**
**Sex (44 responses)**

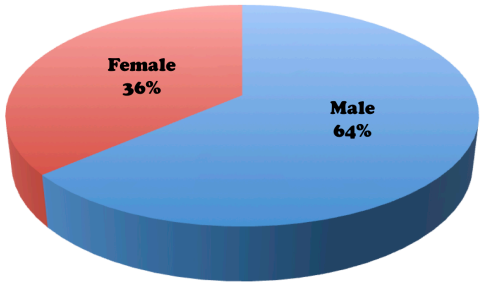



**Figure 3**
**Race/Ethnicity (43 responses)**

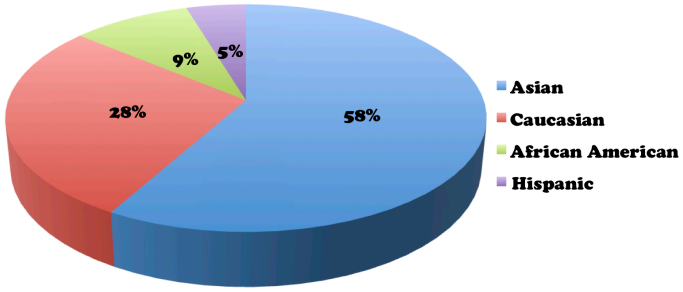
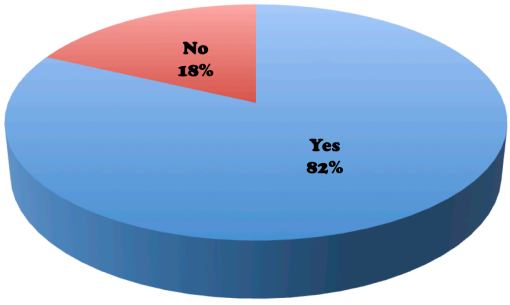



**Figure 4** shows the number of responders who indicated that their research is supported by the National Institutes of Health (NIH). 82% of people (41/50) indicated that their work is supported by the NIH, while 18% (9/50) responded negatively. Out of the people who responded yes, 9/41 indicated that they are the principal investigator (PI) or Co-PI of an NIH-supported grant while 32/41 indicated that they are not the PI or Co-PI of the grants that support their research.

**Figure 4**
**Funded by the NIH (50 responses)**

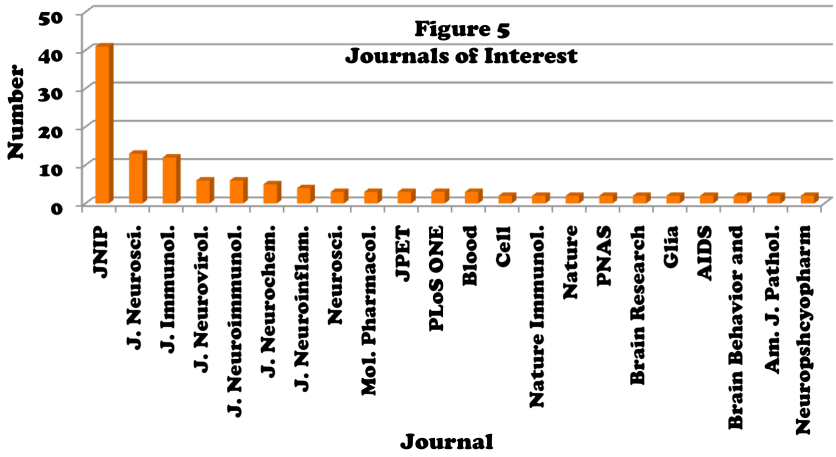



***Jeymohan Joseph and David Stoff:*** *While the percentage of ECIs who are NIH P.I.s that are reported (9/41, 22%) is in line with NIH data on NI (including ECIs) (24%) (http://grants.nih.gov/archive/grants/new_investigators/index.htm, New Investigator Report for FY 2009), this should be cautiously interpreted because the sample is skewed in favor of Asian Americans and Caucasians, i.e., 86%). The data obtained therefore raise serious questions about the need for improved diversity to mirror the demographics of our population, to better represent these groups in the HIV research process, to allow all segments of our population to benefit from advanced in HIV research and, specifically, to improve our understanding of basic HIV disparities issues (e.g., pharmacogenetics). Thus, initiatives to improve diversity might be an effort that SNIP considers since this group is already in an excellent position with access to a network of experienced mentors in basic AIDS research.*

***Brian Wigdhal:*** *My impression after reviewing the results of the Survey and the beautiful analysis is that this important interdisciplinary field is alive and well and is flourishing. It is also clear that a large fraction of the Early Career Investigators are funded by the National Institutes of Health (NIH). In the current funding climate this is encouraging news for the future of field. However, we must not lose sight of the fact that these investigators will need continued nourishment in the form of mentorship of economical healthy senior leaders working in this field and the closely related discipline of neurovirology and others so that as they make their transition to mid-career and senior investigators there will be sufficient national and international resources to fuel their continued development.*

***Harris Gelbard:*** *I have chosen to focus on several key issues that do not appear to be covered in the current survey. The first relates to the significance of the decrease in number of early career investigators that remain in the field of NIP after 5 years (roughly a 66% decline) – does this reflect small sample size or relative lack of historical data from previous years looking at SNIP trainees and their ultimate success in the field of NIP? The second, which very well may be related to the first issue, is the unclear nature of why so few ECI (~22%) are P.I.'s on NIH-funded grants: is this related to the challenge of achieving funding in the current climate? If so, can NIDA program help recalibrate the appropriate study section to help address this? Or does it reflect what is missing from the data in Figure 3: how many of the responders are eligible to be P.I.'s of grants, under current NIH regulations? I emphasize these issues because of the very pragmatic concern for SNIP to achieve growth and success of ECI's, the transition to leadership roles is likely to be linked in success of this same population in achieving independent funding via extramural routes. This is especially problematic because non-NIH sources of funding for NIP do not enjoy the same breadth and depth that neurodegenerative conditions such as Alzheimer's and Parkinson's disease do – for example, a Google search of neuroimmune foundations turns up the Whittemore Peterson Institute, founded by a $3,000,000 initiative from the Nevada legislature, but little else.*

**Figure 5** lists the journals that responders indicated they read for information about advances in NIP. The number of times each journal was listed is indicated on the y-axis. Each response could include multiple journals. The Journal of NeuroImmune Pharmacology (JNIP), which is the official journal of SNIP, was by far the most popular journal. Journal titles that were only indicated once, and are therefore not shown on the graph, include Neurobiology of Disease, Inflammation, Neuron, Immunology, Cerebral Blood Flow and Metabolism, Molecular Immunology, Nature Drug Discovery, Virology, J. Virology, Neuropharmacology, Neuropsychopharmacology, Psychoneuroendicronology, Psychopharmacology, FASEB, Immune Research, and British J. of Pharmacology.

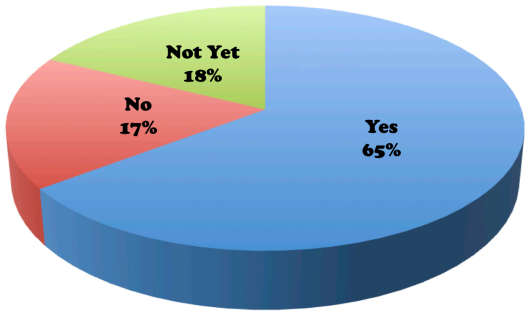



***Howard Gendelman:*** *I was pleased to read that the trainees commonly used the Journal of Neuroimmune Pharmacology as a reference for the field and that they found it useful. Please rest assured we are working with some due diligence to project its contents to an international audience and believe that it has already reached this goal. Although the Journal is young in years it has steadily increased its impact and its breadth. Its future is strong as what it represents for our Society.*

As shown in Figure 5, JNIP is indeed a popular source of information on advances in NIP. **Figure 6** indicates that well-over half of responders have published their research findings in JNIP, and another 18% of responders are planning to publish in JNIP soon. Survey participants also strongly indicated that JNIP is an appropriate platform for sharing their research, especially within the NIP community. A few survey responders seem to feel

that JNIP is an especially strong forum for neuro-AIDS and translational NIP research, but may be less strong for other topics, and may have a limited impact outside of the NIP community.

**Figure 6**
**Publishing in JNIP (51 responses)**




***Howard Fox:*** *In seeking information about the field, the Journal of Neuroimmune Pharmacology (JNIP) is most often consulted, and is clearly key for the society and its aims. The next two journals of utility for the field are the Journal of Neuroscience and Journal of Immunology. Pharmacology journals were infrequently utilized. Fully two-thirds of ECIs have published in JNIP. JNIP was thought to have the most strength in neuroAIDS and translational work. Concerns were raised about the impact of JNIP outside of the NIP community. Clearly the success of JNIP is important to ECIs as it is to the overall membership, and the Publications Committee, Editor-in-Chief, Editorial Board, and publisher must work together to continue its success in serving science and the membership.*

Responders overwhelmingly indicated that they are excited about advances in NIP research. Only 2/51 responders replied that they are not excited about NIP research advances. Regarding the pace of NIP research, again a vast majority of participants responded positively; however, there were some minor concerns in this category. A few people indicated that the pace of NIP research seems to be a step behind that of more broad fields such as neurology, immunology, pharmacology, or virology. It was suggested that the small size of the NIP community may contribute to this slower pace.

***Sabita Roy:*** *It was very encouraging to read that the early career investigators are enthusiastic about the NIP field and the society as a whole and find JNIP an appropriate platform for publishing their research. My advice to the EIC investigators that indicated that the pace of NIP research seems to be a step behind other filed is that "the future of the field is in your hands - Strive to do your best and incorporate cutting edge technologies to delineate mechanisms and strategies to improve therapeutic efficacies and delivery systems. Think outside the box!"*

***Brian Wigdhal:*** *It is my experience that it is not always easy working at the interface of many strong independent disciplines and in this regard societies and specialty journals can serve as critical mass builders to provide encouragement, guidance, and a voice at NIH to spot light the importance of inter-disciplinary collaboration. Such is the case with the discipline of neuroimmune pharmacology, which represents the merger of three strong disciplines (neuroscience, immunology, and pharmacology). Each of these three areas is driven by mainstream investigators with strong research programs and it is often difficult to gain the visibility and attention when working at the interface of two disciplines yet alone three such as the case in the area of neuroimmune pharmacology. The Society and Journal appear to be effectively providing a framework to facilitate this visibility in the scientific community and with the major funding agencies including the NIH.*

Participants enthusiastically responded about important avenues to which they would like to see the NIP field progress by 2020. Specific suggestions include a higher impact factor for JNIP and an increased number of SNIP members. Research topics that were of the most interest are included in the following table, in no particular order.

Leukocyte trafficking into the CNS
- BBB permeability

Neuroimmune involvement in a wide range of neurologic diseases
Improved therapeutic interventions for neuroimmune diseases
- Neuroimmune therapeutics
- HAND therapeutics
- Stem cell therapy applications for HAND

Molecular aspects of neuroimmunology
Delivery of therapeutics across the BBB
- Novel approaches for drug delivery to the CNS
- Nanotechnology and optics and their applications in NIP

Neuroinflammation diagnosis
Better animal models – beyond viral proteins
HAND co-morbidities/co-infections
Signaling and dendritic cells in the CNS
HIV latency in brain resident cells
Drugs of abuse and HIV
- Interactions with antiretrovirals

MS, ALS
Behavioral studies
Neuroimmunology in psychiatry
NIP in aging

***Sabita Roy:*** *I was disappointed to read that Drug Abuse and its interaction with the Neuroimmune Axis was not listed as a research focus of interest. The genesis of SNIP was initially to provide a platform for researchers working in the cross roads of drug abuse and its interaction with neuroimmune axis. Although as we have grown and evolved incorporating NeuoAIDs and other neurodegenerative disease as arms of the society, I still feel very strongly that we should not lose sight of the original aims and mission of the society. We look forward to more junior investigators participating in our various committees and providing suggestions for future directions and symposium topics.*

***Jeymohan Joseph:*** *The research topics identified by the ECIs fall within priority areas for the NIMH NeuroAIDS program. For example research on eradication of HIV/CNS reservoirs, development of novel NeuroAIDS therapeutics and understanding the pathophysiology of HIV-associated neurodegeneration in aging individuals are key research areas that NIMH wishes to foster.*

***Howard Fox:*** *One can always rely on those in the growing stages of their career to have their pulse on important aspects of the field, and the ECIs had an outstanding list of forward-looking research topics important to NIP, ranging from basic to clinical studies. Of note while HIV remains a strong focus, the role of NIP in other neurodegenerative and psychiatric disorders was emphasized as well as therapeutics. In regard to the latter the role of pharmacology in SNIP needs to be examined in greater detail. These can provide the basis for areas of focus for call for talks and papers, and I anticipate further discussions with ECIs and others in the SNIP membership on growing our research in these crucial areas.*

In terms of future job prospects in the NIP field, 17/48 participants responded that they see themselves as a faculty member or PI by 2020. 4/48 participants were unsure about job prospects and 5/48 participants responded negatively regarding job prospects, with the main concern being over future funding opportunities. The remaining participants indicated that future job prospects are good, growing, progressing, and expanding.

Survey responders had multiple suggestions for how to further address under-represented issues and increase group diversity at the SNIP conferences. Targeted advertising at University diversity offices, in other scientific journals, and at other meetings was the most popular suggestion. Word-of-mouth advertising by all SNIP members should also be encouraged. In addition, it was suggested that there could be more competitive travel and/or poster/presentation awards specifically for under-represented or minority researchers. Multiple participants also indicated that more junior investigators should be encouraged to join the society and that these new/young SNIP members should communicate their ideas for session topics at the SNIP meetings. It was suggested that this type of communication could be encouraged through focus groups or round table discussions at the meetings.

***Jag Khalsa:*** *Based on the results of a recent survey of new and early career investigators mentored/supported by SNIP membership, it is clear that a significant number of the early career investigators have been successful in their career and have obtained NIH funding and have assumed leadership roles, a true marker of success of a training program. I suggest that SNIP should, if already not done, establish additional programs of mentorship, mentorship evaluation program, and reward outstanding mentors and mentees. SNIP should consider initiating a program of offering courses and workshops on how to perform the important tasks of research, such as grant writing, lab management, project management, and data presentation.*

Additional suggestions included increased funding opportunities for ECI, workshops for young investigators on topics such as grant writing and funding opportunities, more initiatives to grow the next leaders of NIP research, and perhaps holding SNIP meetings in more affordable locations. Finally, participants commented that NIP is a nicely growing community with wide global interactions and great recognition of young scientists.

***Howard Fox:*** *ECIs were worried about future job prospects. Approximately one-third saw themselves as faculty within the next eight years. Many others were positive, but with an ever increasing worry over research funding, not surprising given that over 80% currently have their research funded through the NIH. A number of good suggestions were made to serve the need of ECIs in their role in the society, career building, and obtaining funding. Given the difficult role of finances, especially for ECIs, a call was made for holding SNIP meetings in more affordable locations. Indeed two of the criteria for site selection for meetings are hotel and airfare expense, and the importance of this needs to be emphasized going forward.*

***Brian Wigdahl:*** *The Survey effectively indicates that Early Career Investigators realize the importance of the Society and Journal in these efforts and are using the Journal and Society to enhance their career development. The future of these efforts will be greatly enhanced by optimizing the development of Early Career Investigators and encouraging the maintenance of a healthy economic and scientific environment nation-wide to continue to nurture them to fuel the development of tomorrow's senior scientists in order to deliver new diagnostics, therapeutic agents, vaccines, and devices to the global population. I think we all applaud the efforts of the Society and Journal in this regard and encourage everyone to continue to think of new and creative ways to continue to enhance these efforts.*