

## EDITORIAL

# Neuro Now!: Should Neuroscience be a Department or a Program?

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“Neuro Now!” That is the battle cry among our students who are fighting for departmental status at Pomona College. Typically at undergraduate institutions neuroscience majors are administered by faculty members in multiple departments. That is, neuroscience is a program rather than a department. Program administration of majors is a very flexible and attractive way for colleges to offer its students additional fields of study without additional resources. When a college has a critical mass of faculty in a coherent and cohesive area of study, it can combine existing resources across departments to offer a full-fledged major. This seems to be a common administrative structure for many interdisciplinary areas of study, such as Women’s Studies, Black Studies, Media Studies, and Neuroscience.

What exactly are our students clamoring for and what is wrong with program status, anyway? I think there are at least three potentially significant limitations--ones that are common to undergraduate and graduate programs alike. First, programs tend to have little say in new and replacement positions. A hire that is in the best interest of a department may not be in the best interest of a program, and vice versa. Because departmental priorities will win out over program priorities, this may make it extremely difficult to staff programs, leaving many programs understaffed or not strategically staffed. Limited staffing can leave some critical areas of the curriculum and research experience without coverage. Second, programs do not have a “home” for their students. Because faculty are scattered among contributing departments, students miss the intellectual stimulation and interpersonal cohesiveness that their counterparts in traditional departments experience. Ed Stricker, who conducts the biannual Associate of Neuroscience Departments and Programs (ANDP) survey stated, “not all schools with neuroscientists as faculty members have departments of neuroscience. Neuroscientists in these other departments understandably want to interact with their colleagues elsewhere on campus, both in research centers and in graduate training programs. The resultant integration for neuroscientists across departments and across schools undoubtedly enhances the quality of those programs while making the community more collegial, more visible and attractive to students and faculty, and more influential on campus.” Third, faculty involved in both a home department and a program tend to have greater demands placed upon them than those who don’t because they are attending to the needs of both entities. This can create a strain on faculty who participate in programs. Often, faculty responsibilities to the program go unnoticed by the department. Recognition of this double duty has become an increasingly vocal issue among Pomona College faculty who participate in interdisciplinary programs. Faculty

members may also be torn between the curricular demands of the department and the curricular demands of the program, further limiting curricular development of the program. Consequently, joint positions limit the effectiveness of faculty participation in the program.

Together, these limitations place restrictions on the growth and development of the undergraduate neuroscience major. Unless participating departments are in complete synchronicity with the neuroscience program, boundaries on the development of the program will become more evident as neuroscience matures. Limits to growth will result in minimal staffing, an underdeveloped curriculum, restricted research opportunities, and a nominal intellectual community for our students. Too often neuroscience majors consist of not much more than existing biology and psychology courses repackaged into a neuroscience major. If we are going to design a thoughtful neuroscience curriculum, we are going to need the autonomy and resources to do it properly.. We are all aware of the benefits to the department structure at academic institutions, including dedicated resources, independence to develop the curriculum, control over hiring, and a common environment for interaction among faculty and students. To be sure, I am not aware of any departments seeking program status. So, when should a program become a department? When is it in the college and students’ best interest to allocate resources typically found in a department? Indeed, at some colleges some of these interdisciplinary areas already have department status.

At Pomona College, part of the answer to these questions depends on whether or not the major is interdisciplinary. According to my dean, interdisciplinary = program = no dedicated resources, whereas discipline = department = dedicated resources. Is neuroscience a discipline or is it interdisciplinary? Many of us like to describe neuroscience as interdisciplinary—it characterizes the multifaceted way that we approach studying the nervous system. I quickly recognized, though, that if I ever wanted faculty appointed into neuroscience, or I wanted dedicated space for neuroscience, I had to stop using the term ‘interdisciplinary’. Fortunately, I found a suitable term in a 1985 compendium of *Science* articles on neuroscience. In the preface, Solomon Snyder describes the development of nervous system research from somewhat isolated, disparate entities into an interrelated, “integrative discipline.” The description of neuroscience being an ‘integrative discipline’ reflects both the multifaceted approach of neuroscience and the permanence and coherence of a discipline.

At one level, the distinction between interdisciplinary and disciplinary (or integrative discipline) seems artificial, but the distinction seems to carry some academic or at

least administrative weight. The Society for Neuroscience is of the opinion that neuroscience is now a discipline, stating on its website, "Only in recent decades has neuroscience become a recognized discipline. It is now a unified field that integrates biology, chemistry, and physics with studies of structure, physiology, and behavior, including human emotional and cognitive functions." Steven Hyman considers the question of whether neuroscience is a discipline in an essay on the future of doctoral education in neuroscience as part of the Carnegie Initiative on the Doctorate. He concludes, "The members of the class of 'academic disciplines' are not all tidily alike in their scope, complexity, origins, clarity of boundaries, or trajectory. I think it is fair, indeed, to say that enough specialist knowledge and new ways of thinking have developed in the service of understanding the brain to being a discipline itself." Eric Kandel eloquently stated in 1982, "As currently structured, neuroscience has woven into one cloth these previously independent scientific strands. This new arrangement is meaningful both historically and scientifically." Consequently, there is some convergence of opinion that neuroscience is, or is becoming a discipline in its own right.

Certainly, part of the answer to the question of when does an interdisciplinary field become a discipline has to do with our disciplinary identity. Once we begin to share more interest in issues, methods, training, conferences, and journals with our neuroscience colleagues in other departments than we share with colleagues in our own department, then the interdisciplinary field begins to function more as a discipline. With respect to the graduate school structure, Zach Hall recently noted, in another essay as part of the Carnegie Initiative, "In many cases, the [neuroscience] interdepartmental graduate program has become a more important scientific and intellectual community for its members than their home departments." Consequently, scholars in neuroscience have developed an identity as a neuroscientist more than as a biologist, chemist, or psychologist. Other considerations for disciplinary status might include the size of the field, student interest, significance of the field, length of its history, and long-term trajectory. Neuroscience fares well as a discipline when considering such criteria. But what are the implications of disciplinary status for undergraduate institutions?

When I have questions regarding undergraduate neuroscience departments, I turn to the 'Dean of Departments,' Denny Smith at Oberlin College. He told me, "We remained as a program for as long as we did because we felt, at the time, that program status better reflected the interdisciplinary roots of neuroscience particularly in biology and psychology. Our feeling now is that Neuroscience has emerged as a field that is independent enough from biology and psychology so that it can stand on its own and that students in the field get a better education concentrating in neuroscience rather than an education that only supplements the curricula of either a biology or psychology major." So, at Oberlin, their transition from a program to a department paralleled their

perception of neuroscience transitioning from an interdisciplinary field into a discipline.

While not set in stone, disciplinary status seems to afford not only academic prestige but also the resources and autonomy to develop its own program of study, without dependence on or interference from other disciplines or departments. Above, Hyman cautions us against expecting that all disciplines will look alike in their 'scope, complexity, origins, clarity of boundaries, or trajectory boundaries.' Indeed, modern neuroscience, developing out of the life sciences, where fluidity among disciplines and subdisciplines is more the rule than the exception, should not pattern itself to look like other disciplines, especially those that tend to isolate themselves from other disciplines. In fact, both Hall and Hyman believe that one of the main challenges facing neuroscience is to preserve its core while reaching out to other disciplines that can facilitate our understanding of the nervous system, whether it is engineering, economics, or philosophy. In other words, neuroscience may be both a discipline and interdisciplinary at the same time. This may present bureaucratic and educational challenges, but it signals a dynamic future for scholarship on the nervous system.

How should we prepare for these implications at undergraduate institutions? Do the developments in neuroscience have any implications for undergraduate institutions? And, if so, how should we prepare for these implications? At Pomona College, we feel that we are fighting for our future. We continually feel that our resources are not keeping pace with student interest and developments in the field. Our students are fighting for more courses, more research opportunities, and a home. How can we provide the education we expect to provide for our students until these needs are met? At undergraduate institutions where enrollments and resources are stable, increasing resources for a new discipline can be a difficult and risky endeavor. Undergraduate institutions are not as flexible as research institutions in responding to new or developing areas of scholarship. Surely, other colleges must be facing similar issues, how do they perceive the situation, and how do they meet the challenges? I decided to conduct an informal and unsystematic survey of some other liberal arts colleges. What was so revealing to me, given the rather homogenous nature of the institutions surveyed (having not polled undergraduate programs at other types of institutions), was not the common challenges we all face, but the varied contexts in which these challenges occurred and the different solutions proposed to meet these challenges.

The number one complaint among chairs was needing more faculty to cover the range of neuroscience and to meet the increasing student demand. Whether or not departmental status would facilitate meeting this need depended on the context of the program. For example, some neuroscience programs have hiring priorities that seem to match those of participating departments. In these programs the prospects of these departments hiring more neuroscience faculty seems likely. For others, their institutions allow faculty to be hired directly into the

neuroscience program, thereby providing them with some autonomy in staffing their program. Those institutions that perceive less support from participating departments find that departmental status would provide them with greater control over future hires. But, some programs see the monetary and bureaucratic costs associated with being a department as outweighing the benefits of greater staffing control. For Oberlin, becoming a department didn't seem to solve their problem of meeting the large demand for neuroscience among its students. Rather, it may have actually created an even greater demand. But, if this is true, then the benefit of departmental status speaks for itself, at least from a student perspective. Personally, I don't see how we can fully develop an undergraduate neuroscience experience without more autonomy than program status typically affords. The increase in student interest at Oberlin following departmental status supports this position.

Trying to understand the context and proposed solutions to the staffing problem at other institutions helped me to better understand my own. Although, not currently an option at Pomona College, some institutions allow faculty to be directly hired into the neuroscience program. This middle ground between program and departmental status would not solve all of our problems, but it might solve some.

An unintended consequence of the "survey" was realizing the greater need for communication among undergraduate institutions regarding programs, curriculum, facilities, research training, administrative strategies, etc. Hall (2006) puts this into perspective for us, "The implications of neurobiological research are so broad and so fundamental that many feel that neurobiology, in its broadest sense, will be one of the dominant themes of intellectual life in the university in the twenty-first century... The challenge is to develop a program that will capitalize on these new interactions to encourage and facilitate the development of vital, new interdisciplinary fields while, at the same time maintaining core expertise in neuroscience. Each university will decide based on existing structures, history, and personalities, how to fashion academic structures to meet these competing demands." If Hall is right, then, we need to prepare for this at the undergraduate level also.

I started to think about ways that we could facilitate communication among our institutions and help each other to prepare our programs for the 21<sup>st</sup> century. Certainly, we could use the existing FUN listserv to communicate about these topics, and, one of my harebrain ideas is to have videoconferences. But nothing replaces the kind of relaxed, opportunistic face-to-face interactions that takes place at conferences. I believe that we would benefit from having a meeting similar to the Association of Neuroscience Departments and Programs (ANDP) meetings, which occur twice a year—once at Society for Neuroscience and once in the spring in the D.C. area. According to their website, ANDP "is an organization of more than 250 member departments and programs from academic institutions in North America. ANDP's goal is to advance education and research training in academic

neuroscience programs by disseminating information about neuroscience education and providing a forum for discussion of issues in training and research at both the institutional and national levels." Although ANDP has membership from undergraduate and graduate programs, it tends to cater to graduate and post-doctoral issues.

I just got back from attending the spring meeting of ANDP. On the agenda were sessions on "Predictors of Success in Graduate School," "The Neuroscience Textbook of the Future," "ANDP and SfN: Partners in Public Education," "Non-US Trainees in US Labs," "Carnegie Initiative on the Doctorate," and results of the ANDP survey. While some of the sessions focused on issues that are not directly relevant to undergraduate education, some are. While I believe that we could benefit from having a meeting that would focus on analogous undergraduate training issues, I also believe that we could benefit from greater interaction with graduate schools because we have a common interest—our students (our students become their students). Designing sessions in conjunction with FUN might be a logical first step. But, I also think that having a satellite session with ANDP's spring meeting might be particularly beneficial. ANDP appears interested in greater participation among undergraduate institutions, and ANDP officers approached me about how to achieve more interaction. We thought it might be interesting to schedule a satellite undergraduate meeting either directly before or just after ANDP's spring meeting. It might attract some of us to their meeting and some of them to our meeting.

What do you think? Please post your responses on the FUN blog at <http://funfaculty.blogspot.com/>.

## References

- Hall ZW (2006) Maintaining vitality through change. In: *Envisioning the future of doctoral education* (Golde CM and Walker GE, eds), pp211-225. Stanford, CA: Jossey-Bass.
- Hyman SE (2006) The challenges of multidisciplinary: Neuroscience and the doctorate. In: *Envisioning the future of doctoral education* (Golde CM and Walker GE, eds), pp226-243. Stanford, CA: Jossey-Bass.
- Kandel E (1982) The origins of modern neuroscience. *Annual Review of Neuroscience*, 5:299-303.
- Snyder SH (1985). Neuroscience: an integrative discipline. In: *Neuroscience* (Abelson PH, Butz E, Snyder SH, eds). Washington, D.C.: AAAS.
- Society for Neuroscience. Available at <http://www.sfn.org>.
- Stricker EM (2003) The 2003 ANDP survey of neuroscience graduate, postdoctoral and undergraduate programs. Available at [www.andp.org/surveys/surveys.htm](http://www.andp.org/surveys/surveys.htm).

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