

# Psychobiology and Neuroscience at the Florida State University: A history

Michael E. Rashotte, James C. Smith \*

*Program in Neuroscience, Florida State University, Tallahassee, FL 32306, USA*

## Abstract

In the 1950s, young faculty in Psychology and Physiology/Biology at the newly established Florida State University recognized common interests in the study of sensory systems. They spontaneously formed one of this country's earliest interdisciplinary research cohorts in the emerging field of "psychobiology". In the 1960s, this group established a formal graduate program in Psychobiology, acquired resources for building a new laboratory and for supporting pre- and post-doctoral students, and began the expansion of faculty and research focuses that continues to this day. In 1991, FSU's Psychobiology Program was re-branded as a Program in Neuroscience that awards a doctoral degree. It now encompasses faculty and students from four academic departments in the Colleges of Arts and Sciences, Human Sciences, and Medicine. This paper traces some main developments in our 50-year history of these research and training efforts.

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## 1. 1947: Florida State University is established

Florida State University (FSU) was established in Tallahassee as a co-educational institution in 1947 as part of Florida's response to educating the wave of returning veterans from World War II. Its institutional predecessor, Florida State College for Women (FSCW), had already been in Tallahassee for about 50 years. FSCW had a distinguished record in providing undergraduate education for women, and its faculty included many women and men with doctoral degrees from the best institutions in the country. Along with practical training for careers in teaching, the arts, and family management that was provided at American women's colleges at that time, FSCW included training in research in fields such as psychology and biology. The first Master's degree earned at FSCW (in 1912) was based on an experimental study of human memory. In the years immediately following the establishment of FSU, the institution hired many new research-oriented faculty and established doctoral degree-granting programs in several areas of study. Today, FSU is a Carnegie Research I

University with 1500 faculty, 35,000 students (including 7000 Graduate students), and annual sponsored-research funding of \$180 million.

## 2. 1950–early 1960s: Psychobiology takes root at FSU

A series of faculty hires in Psychology and Physiology/Biology beginning around 1950 inadvertently provided a stimulus for interdisciplinary research that resulted in the founding of our Psychobiology program.

In 1950, Winthrop N. Kellogg (1898–1972; Ph.D. Columbia University, 1929) was hired as a senior research professor in Psychology. Kellogg had been at Indiana University for many years and was well known for work on conditioning in animals and, particularly, for a research project conducted in the early 1930s in which he and his wife raised their infant son with an infant ape for about 9 months to study the effects of environment and genetics on early developmental stages [1,2]. At FSU for over a decade, Kellogg carried out work that also became widely known on echolocation in porpoises and humans [2,3]. Although Kellogg was not directly involved in establishing our Psychobiology Program, his presence on the faculty and his prominence as a researcher in Experimental Psychology

\* Corresponding author.

*E-mail addresses:* rashotte@psy.fsu.edu (M.E. Rashotte), jcsmith@psy.fsu.edu (J.C. Smith).

attracted several vigorous young scientists to Psychology who became cornerstones of the program.

By their own accounts, the news that Kellogg was coming to FSU was an important factor that encouraged two young faculty members to join FSU's Psychology Department as experimental psychologists. Howard D. Baker (1921–2004; Ph.D. Columbia University, 1949) arrived in 1950 and established a research program in vision that continued until his retirement in 1991. Daniel R. Kenshalo (1922–; Ph.D. Washington University, 1953) also arrived in 1950. In 1954 experimental psychologist John Paul Nafe (1886–1970; Ph.D. Cornell University, 1923) of Washington University came to Florida State as our first Distinguished Professor of Psychology. With Nafe, Kenshalo began a program of research in the cutaneous senses that he continued until his retirement in 1989.

Simultaneously with these developments in Psychology, other new faculty in the Physiology/Biology Department were establishing research programs that were also to provide significant momentum for psychobiology research on sensory systems. Lloyd M. Beidler (1922–2003; Ph.D. Johns Hopkins University, 1950) joined the faculty in 1950 and began his influential physiological and anatomical research on the gustatory system. Dexter M. Easton (1922–; Ph.D. Harvard University, 1947) was hired as a comparative physiologist in 1955. Also, in 1955, Harry J. Lipner (1922–2001; Ph.D. State University of Iowa, 1952) joined the faculty in Biological Sciences and remained until his retirement in 1989. Lipner taught all of the Psychobiology graduate students mammalian physiology. Michael J. Greenberg (1931; Ph.D. Harvard University, 1958) was hired at FSU in 1964 and stayed until 1981.

Howard Baker later recalled how these young faculty members in Psychology and Physiology/Biology recognized their common interests in sensory systems and began an informal seminar in the 1950s. That seminar ultimately led to the founding of our interdisciplinary Psychobiology Program, one of the country's first. Baker's recollection indicates that, from the very beginning, collegiality and collaboration among faculty and students have been defining characteristics of our program.

"I had known Lloyd Beidler when he was in the Biophysics Department at Johns Hopkins, and we continued our interest in one another's research programs at Florida State. Sometime in the first years after 1950 we started an informal weekly seminar with those of us who were interested in research connecting the areas of physiology and psychology. We met at night in the upstairs psychology classroom . . . . After a year or two we thought we ought to call the group something, and Dexter Easton said he had heard of a word with amusing connotations, "Psychobiology." It was a new word to us, but we thought that it was funny so we began to call ourselves that. As the years went on and the group became more cohesive and permanent, we used the name more and more seriously.

The seminar was a forum for our own informal reports and arguments and it served as a bridge between the Psychology Department and the Physiology Department, now part of Biological Sciences.

The early Psychobiology Seminar was important. No academic credit was associated with it—it was completely unofficial and voluntary, done because the participants wanted to do it, with little distinction between faculty and students. It was an affirmation of the idea that science is interesting and worthwhile, and does not require official direction or recompense" [4].

In the later 1950s, this group achieved more momentum in the study of sensory processes when Psychology succeeded in attracting James C. Smith (1928–; Ph.D. Florida State University, 1959) to return as a faculty member. He immediately began a research program studying the psychophysics of sensory systems in animals and humans that has continued for almost 50 years and has been a mainstay of the program. Also, Donald Tucker (1924–1979; Ph.D. Florida State University, 1961) was hired as a Research Associate in the Biological Sciences in 1961, and he began an influential research program on the electrophysiology of olfaction that continued until his untimely death in 1979.

The underpinnings of a formal training program in Psychobiology occurred in 1958 when Lloyd Beidler received an NIH training grant to support 5 post-doctoral students in the chemical senses. That grant continued without interruption until 1980 and provided a steady stream of excellent researchers, many from Europe and Japan, who have become leaders in their fields.

### 3. 1960s–1970s: Psychobiology program formalized and expanded

In the early 1960s, Lloyd Beidler and Dan Kenshalo, representing the sensory faculty in Biology and Psychology, respectively, became the first co-directors of our Psychobiology Program. Participating students enrolled in one of the two departments, and received a graduate degree from that department, but completed an augmented training curriculum with emphases in Psychobiology. The program's on-campus stature, and its ability to attract students, received a very significant boost around 1964 when major grants were received from NSF and NIH that provided resources for infrastructural changes that resonate to the present time.

From NSF and NIH, the Program received funding as part of Science Development/Center of Excellence awards to FSU. This funding supported construction of a 5-story building with 32,000 square feet of research space for the Psychology Department's psychobiology faculty, provided about 14 new "psychobiology" faculty lines to be split between the Psychology and Biology Departments, provided

about 15 technical and staff positions to operate research facilities for the Program, and included a large equipment and annual expense budget. More or less simultaneously, the Program received a pre-doctoral-training grant from NIH to support students studying sensory research, an important complement to Beidler's post-doctoral training grant in the chemical senses. The State of Florida agreed to maintain the lines, the graduate student funding, and the expense budget permanently when the grant period ended.

Needless to say, this was a heady period of development for Psychobiology at FSU. The new Psychology Research Building was completed in 1965 (re-named the Kellogg Research Building in 1981 to honor Winthrop N. Kellogg). A rash of new faculty hiring in Biology and Psychology began in 1967 and continued through the early 1970s, resulting in new strengths in the program's fields of sensory research (vision: Mark A. Berkley, Ted P. Williams; audition: R. Bruce Masterton, Lloyd F. Elfner, Karen K. Glendenning; olfaction and taste: Pasquale P.C. Graziadei; pain sensitivity: Karen J. Berkley) as well as expansion to new research emphases including circadian biology (Friedrich K. Stephan), behavior genetics (Glayde Whitney), learning/energetics (Michael E. Rashotte), endocrinology (Marc E. Freeman), and axonal maintenance, growth and repair (John S. Elam). In this time period the substantial technical facilities of the program were established including machine- and electrical-shop facilities well-staffed with engineers and technicians, a histological laboratory, and an electron-microscope with which Lloyd Beidler made some of the first high-magnification images of biological tissue.

Because Tallahassee is not located in an area where scientists from other institutions are easily available for interactions, the Program felt it important to bring such scientists to campus on a regular basis. Since the mid-1960s, our students and faculty have gathered at our weekly Psychobiology Colloquium for presentations by visiting speakers. We have also maintained a second, more informal, weekly meeting where visitors and local faculty and students present their work and ideas for discussion, a continuing version of those informal weekly faculty–student meetings in the 1950s from which the program emerged. Appropriately, our informal weekly meeting is named the Howard Baker Research Seminar. We also began a visiting lecturer program which provided the opportunity for pre- and post-doctoral trainees to interact with top-level visiting scientists for an extended period of time. The sensory emphasis of the program in the early years is reflected by some of the regular visitors: Carl Pfaffman (Brown University), Vincent Dethier (University of Massachusetts), Kenneth Roeder (Tufts University), Yvonne Zotterman (Stockholm) Eliot Stellar (University of Pennsylvania) and William Rushton (Cambridge University). Rushton, who first visited in 1968 and was later appointed on a half-time professorship until he retired in 1976, was involved in collaborative research with faculty and students studying the visual system. In the years since Rushton's

death in 1978, the Program has held an annual research conference named in his honor.

#### **4. 1980s–early 2000s: Psychobiology becomes a degree-granting program in neuroscience and expands beyond psychology and biology**

After the strong period of development in the 1960s and 1970s, the Program stabilized and prospered in the decade of the 1980s, with high productivity in research funding, scholarship, and graduates. Compared to the earlier era, there was little faculty hiring in this decade: in the Biology department, the unexpected death of Donald Tucker in the late 1970s was followed by the hiring of a young researcher in olfaction, Michael Meredith; in the Psychology Department, we attracted Charles C. Ouimet, working in neuronal plasticity, and we made a rare senior hire in the person of Robert J. Contreras working on developmental aspects of chemical senses, feeding and cardiovascular status. The 1980s also saw the first change in the Biology/Psychology co-directors of the Program since its inception: Lloyd Beidler stepped down (replaced by Mike Meredith) and Dan Kenshalo retired (replaced by Mark Berkley).

Because the field of Neuroscience emerged as the primary field of interest for faculty in the Psychobiology Program in the 1980s, and because it seemed more suitable that our psychobiology students be awarded doctoral degrees in Neuroscience (rather than in Biology or Psychology), the Program proposed both a change in its name and a degree-granting status from the State Board of Regents. The latter initiative turned out to require a sustained and paperwork-intensive effort on the part of our co-directors, Mike Meredith and Mark Berkley. Eventually, the proposed changes were approved and Florida State University's Program in Neuroscience came into formal existence in 1991. Our first degree in Neuroscience was awarded in that year to Lawrence O'Keefe, a student of Mark Berkley.

The 1980s also saw two important developments in our support facilities. We were fortunate to permanently acquire the expertise of Ross P. Henderson (M.S.E.E. University of Wisconsin, 1977), a biomedical engineer whose superb designs of custom scientific instruments have been widely recognized; many research programs here and elsewhere have benefited from his creativity and counsel. Also in 1991, the University completed a Laboratory Animal Resources Building that serves our Program and other researchers on campus. This facility included state-of-the-art housing and veterinary facilities for animals, and a floor of research labs and offices that are primarily used by faculty and students in our Program. Our Program has been extremely fortunate to have a stable and supportive lab animal veterinarian group, headed by Robert M. Werner (D.V.M. University of Georgia, 1970) who has established

what can only be described as model working/support conditions for our researchers and students.

The 1990s and early 2000s saw several important losses in faculty due to death (Bruce Masterton and Mark Berkley in Psychology and Pasquale Graziadei and Lloyd Beidler in Biology, or retirement (Lloyd Elfner, Mike Rashotte, Jim Smith in Psychology). Because of hiring freezes that were not unique to our Program, we hired faculty gradually during the 1990s who became affiliated with the Program (in Psychology: Richard L. Hyson, Frank Johnson, Zuoxin Wang, Lisa A. Eckel; in Biology: Paul Q. Trombley, Thomas A. Houpt, Debra A. Fadool, James M. Fadool). In 2004, the Psychology Department made two additional hires in Neuroscience: Elaine Hull, a distinguished senior neuroscientist, and Carlos Bolanos, a junior neuroscientist.

In this same time period, our Program in Neuroscience also gained added faculty strength from affiliations by faculty located in other Colleges of the University who were conducting neuroscience research. Two faculty members from the College of Human Sciences (Department of Nutrition, Food and Exercise Science) joined our program in the 1990s: Cathy W. Levenson and J. Michael Overton, and two faculty members from FSU's new College of Medicine (Department of Biomedical Science) joined in the 2000s: Mohamed Kabbaj and Curtis Altmann. (Our current roster of faculty from the College of Medicine faculty also includes Charles Ouimet who transferred from Psychology to the College of Medicine when it was established.) A sample of the research interests of these newly added faculty, and of other members of the 22 current faculty in our Program in Neuroscience, makes up the rest of this volume, and can also be found on the Program's web site [5].

To complete this short history, we note that the administrative structure of our Program in Neuroscience has recently changed to accommodate the expansion of faculty and student participants from academic units other than the founding Departments (Biology and Psychology). We now have a single Program Director who oversees all aspects of the Program's activities. Rob Contreras is the first incumbent in the director's position.

## 5. 2005: Current program configuration

Over the past 50 years, our research focus has evolved from an initial emphasis on sensory systems to a Program in

Neuroscience that offers five areas of research emphasis: Cellular and Molecular Neuroscience, Neural Plasticity and Development, Energy Balance and Metabolism, Neuroendocrinology and Behavior, and Sensory Systems [5]. In terms of the total number of faculty and students, we are a relatively small-sized program in the neuroscience community. We have a long history of success in training students who have become leaders in their field, we have strong research funding as a result of institutional support and grant-activity of individual investigators, we continue to hold training grants, and our faculty and students utilize unique research facilities associated with our institution, such as the National High Field Magnetic Laboratory, the new Florida Scripps Research Institute, and custom-made instrumentation designed and produced by our Technical Support Group. Many of the Program's students have been supported by a long-running specialized training grant in the chemical senses (NIH), by an early year general training grant (NIH Jointly Sponsored Predoctoral Training Grant), and by Neuroscience Fellowships funded by local institutional support. Our students are highly competitive in obtaining individual pre- and post-doctoral NRSA support from NIH. More generally, our students and faculty are attracted by the highly collegial nature of our training program in which cross-laboratory collaboration and training in behavioral, physiological, and molecular approaches to problems in the field is a norm. As we have described in this brief historical account, many of these characteristics were part of the context in which our program began, and they have endured for 50 years.

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