

Allison Doupe: In Memoriam

Allison Doupe, Professor of Psychiatry and Physiology at UCSF, died on Friday, October 24, 2014 after a long and courageous battle with breast cancer. She was an esteemed leader of UCSF's neuroscience community and a pioneering systems neuroscientist. She is best known for her research on the detailed neuronal mechanisms involved in birdsong learning and on the relationship of this process to the learning of human speech.

Allison was born in 1954 in Montreal, Canada, where she attended French-speaking schools. Her academic career was outstanding from the start, with first class honors at McGill, an MD, a PhD in neurobiology from Harvard University, and a junior fellowship from the Harvard University Society of Fellows. Her PhD work with Paul Patterson established the role of particular environmental factors in the development of autonomic neurons and was important in the molecular and cellular investigations of the roles of hormones and growth factors in that system.

After completing her MD and PhD, Allison decided to get clinical training in psychiatry. She began with an internship at the Massachusetts General Hospital and completed a full residency in psychiatry at UCLA. She then went on to a five-year postdoctoral fellowship at Caltech where she switched from cellular and molecular studies to research on song learning in birds under the guidance of Masakazu (Mark) Konishi. Upon completion of this lengthy multidisciplinary training Allison was recruited to an assistant professorship at UCSF in 1993, with a primary appointment in the Department of Psychiatry and with joint appointments in the Department of Physiology and the Program in Neuroscience. She was promoted to full professor in 2000 and remained at UCSF throughout her career.

As Allison was getting started at UCSF she sought the company and counsel of two other young female neuroscientists in the Bay Area, Carla Shatz and Sue McConnell. At their monthly meetings, called "Girls Night Out," they discussed the special challenges then faced by young women as they set up their labs. They greatly valued these discussions

because they could complain to each other and support each other in ways that were more open and productive than in similar discussions with male colleagues. Each subsequently became a role model for other young women who were entering the field.

In choosing a theme for her new laboratory Allison decided to continue her work on birdsong because it combined her clinical interests in behavior and development with her interests in neuronal mechanisms and cognitive neuroscience. Peter Marler's pioneering work on song sparrows in San Francisco's Golden Gate Park had shown that each male baby songbird learns his father's dialect or that of any other bird of the same species placed in the role of tutor. Many birds, including the zebra finches studied by Allison, learn their song by listening to their tutor during a developmental period when they are not yet singing themselves, and later practice and perfect their own song by comparison with their memory of his. Allison wanted to know how this comes about. In doing this she helped expand the study of birdsong from its ethological roots to its present state as a model system.



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At first Allison worked on the refinement of techniques for behavioral measurement and for mapping circuits. But she was also interested in the more challenging problem of analyzing the neuronal computations involved in song imitation and learning. By 2000, working with trainees Frederick Theunissen and Michael Brainard, Allison began establishing birdsong as a prime subject of computational neuroscience.

As this work progressed Allison showed how the bird analog of the basal ganglia participates in imitative learning of a skill and discovered neurons that selectively respond to the sound of the bird's own song, as opposed to that of the tutor. Her work demonstrated how particular neurons in the forebrain allow the young bird to learn its individual song and stabilize the song in adulthood through auditory feedback. She, and the members of her laboratory, revealed the neural underpinnings of the dramatic effect of social context, in which the bird's basal ganglia-like structure generates the variation in performance that is needed for improvement during practice sessions, but lets the bird sing perfectly stereotyped renditions in the presence of a potential mate. In her hands and those of her students, the progressive refinement of a bird's song has become a major system for studying precise sensorimotor control and its development. She viewed this work as a model for the development of language in humans, which also relies on imitation and auditory feedback, and spelled this out in a highly cited *Annual Review of Neuroscience* paper with linguist Patricia Kuhl.

Allison was a popular mentor for students and fellows, and inspired them not only with her scientific vision and rigor, but also with her kindness and humanity. A determined leader and doer, she worked doggedly for the good of her community. Along with her UCSF colleagues Cori Bargmann and Ulrike Heberlein, she tirelessly lobbied the university leaders to give neuroscience the recognition it deserved. In the past few years, she became the acknowledged leader of



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Allison Doupe with her husband Michael Brainard and her sons Alec and Sam.

systems neuroscience at UCSF and succeeded Steve Lisberger as director of UCSF's Center for Integrative Neuroscience. In these roles, she was a major force in the design and construction of the Sandler Neuroscience Building and

in the development of its thriving scientific community.

Allison also played an important role in integrating the Department of Psychiatry's activities with those of the neuroscience program. In recent years, she served as Vice Chair for Basic Science Research and as chair of a search committee to recruit new junior faculty in this area. For more than a decade she worked with Louann Brizendine in UCSF's Women's Mood and Hormone Clinic, where Allison's understanding of hormonal effects on behavior contributed to its educational and clinical mission. Faculty, medical students, psychiatric residents, and patients greatly appreciated her special perspective on psychiatry and her warmth as a doctor.

Allison and her students were honored with many awards for their scientific contributions. She was elected a Fellow of the American Academy of Arts and Sciences in 2008. Most recently she received the 2014 Pradel Research Award from the National Academy of Sciences.

But even more than for her academic contributions, Allison will be remembered for her exceptionally vital and enthusiastic personality. For all her success as a

researcher, Allison was not just a scientist. More than many of her colleagues, Allison placed great importance on her personal relationships. She was consciously committed to a proper balance between life and work, and her exceptional energy, courage, and optimism, even as her illness progressed, helped her succeed at both.

Allison is survived by her husband, UCSF Professor Michael Brainard, and by her 10-year-old twin sons Alec and Sam. She is also survived by and a large and loving community of family and friends throughout the world.

ACKNOWLEDGMENTS

We would like to thank John Lisman for the photograph of Allison with her husband and sons.

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