

COMMITTEE ON FACULTY RESEARCH LECTURER
REPORT TO THE RIVERSIDE DIVISION
MAY 28, 2013

**NOMINATION OF DISTINGUISHED PROFESSOR ALEXANDER S. RAIKHEL FOR
2013-14 FACULTY RESEARCH LECTURER**

From its inception well over half a century ago, the Faculty Research Lecturer Award has been the highest honor that the Academic Senate bestows. The Committee on the Faculty Research Lecturer is honored to place in nomination by acclamation, Alexander S. Raikhel, Distinguished Professor of Entomology and UC President's Chair, Department of Entomology.

Our selection was based on a combination of factors, including Professor Raikhel's extraordinary productivity and wide acclaim for the high quality of his research, especially that dealing with two major fields in insect physiology and vector biology, the hormonal control of egg development in mosquitoes, and innate immunity in insects. As noted by the extramural scientists within the U.S. and abroad who supported his nomination, including three members of the U.S. National Academy of Sciences and a recent Nobel Laureate, Professor Raikhel's research is insightful and pioneering, placing him among the top insect molecular biologists worldwide. Owing to his outstanding research and its international impact, Professor Raikhel has received many honors, among which are his election to the U. S. National Academy of Sciences, and as a Fellow of the Entomological Society of America, both in 2009.

Professor Raikhel's research focus is on insect reproductive biology, with particular emphasis on the molecular biology of vitellogenesis (egg yolk production) in the mosquito *Aedes aegypti*, which he uses as a model system. He also uses this mosquito to study innate immunity in insects. Indeed, he is *the* recognized world leader in these two critical areas of arthropod physiology. Professor Raikhel's ultimate goal is to use knowledge derived from his basic research on genetic regulation of the hormones associated with control of mosquito reproductive physiology and immunity to interfere with the ability of mosquitoes to transmit the pathogens that cause devastating human diseases such as malaria and dengue. Since 1983, Professor Raikhel's research has been supported primarily by the National Institutes of Health (NIH). Based significant advances achieved by his laboratory, as well as his prolific record of high quality publications, the NIH awarded Professor Raikhel a 10-year MERIT Award of more than \$4,000,000 in 2002. During his career, Professor Raikhel has published more than 130 peer-reviewed papers, 29 book chapters, 8 edited books, and 11 review articles among numerous other papers. His peer-reviewed papers appear routinely in the most respected scientific journals including *Science*, *Proceedings of the National Academy of Sciences*, *Immunity*, *Journal of Biological Chemistry*, *EMBO Reports*, *FASEB Journal*, and *PloS Pathogens*.

The following comments are characteristic of those made by extramural scholars who wrote in support of Professor Raikhel's nomination as Faculty Research Lecturer, most who hold endowed chairs or are at the Distinguished Professor level. A fellow molecular biologist wrote "His scientific productivity is very high, and he routinely publishes in highly regarded, very selective journals. His work to detail molecular mechanisms of vitellogenesis has been ground-breaking, and he is now making excellent progress in sorting out functions of microRNAs in mosquito physiology." Another wrote "Dr. Raikhel's research and his publications typically include a multidisciplinary focus and innovative methods, and as a reflection are published in high impact journals. Dr. Raikhel has also been a superb mentor of students and postdoctoral fellows, who have continued his excellent tradition at other academic institutions." An internationally recognized biochemist stated "In the last few years, he has published an exceptional series of papers on regulation of the innate immune system of mosquitoes. This work has high significance and potential human health relevance, for understanding the interactions of mosquitoes with the pathogens they transmit." A leading international immunologist wrote "The two words which immediately come to my mind when thinking of Professor Raikhel's achievements are: *pioneer* and *leadership*" and further commented that "His experimented approaches have constantly evolved and he has adapted modern techniques to a system of great medical interest, which was *a priori* not easily amenable to the type work

he has undertaken. Through his pioneering role in an ever enlarging community of scientists, Professor Raikhel has acted as a leader and many groups have relied on his experience and achievements for their own work.” Another internationally recognized molecular biologist wrote “Alex is a world leader in vector biology and mosquito research of any stripe, and particularly in hormone signaling and reproductive biology, where he is almost certainly THE leader.” These comments are similar to those by two leading American molecular biologists in the field who note “The key point is that Alex has led a world-class research program in insect reproduction that is recognized as being at the very top of his field throughout the world. It is also important to recognize that while Alex’s work focuses on mosquitoes, his findings have contributed to our understanding of biological processes in many other species of insects and invertebrates.” The other states that “Jealously speaking, the Raikhel lab has been on the leading edge of several areas of important focus for more years than I care to count. Indeed, their seminal work on hormone regulation, gene silencing and the immune system in *Aedes aegypti*, stand apart from almost any lab currently active. Simply put, in my opinion, and by a wide margin, Alex is the world leader in many of these fields.” Two other senior American scientists who follow Professor Raikhel’s research state “His work is characterized by an insightful and innovative approach together with a careful and detailed analysis of the problem to be solved. The studies are always well-done and of the highest quality, so are of immense value to the field.” The other notes “The scope and quality of his work in this area rivals that of the best type being done in the more developed genetic system offered by *Drosophila melanogaster*. Indeed his mosquito work benefits from the coordinated control of expression of oogenesis-related genes that are initiated following a bloodmeal. As such, he has been able to make key contributions to the understanding of hormone-regulated gene expression.”

Lastly, we note that Professor Raikhel’s research over the past decade at UCR and his receipt of a NIH MERIT award were important contributions to UCR’s Department of Entomology being one the top two of 28 entomology departments in the country ranked recently by the National Research Council.

For his high productivity of outstanding science, numerous accolades from other distinguished scientists nationally and internationally, and prestigious awards including election to the U. S. National Academy of Sciences, and as a Fellow of the Entomological Society of America, the undersigned members of the Senate Committee on Faculty Research Lecturer, unanimously and enthusiastically nominate Distinguished Professor of Entomology Alexander S. Raikhel as Faculty Research Lecturer for 2013-14.

Brian A. Federici (Department of Entomology) - Chair
Norman Ellstrand, (Department of Botany and Plant Sciences)
Christopher A. Reed (Department of Chemistry)
R. Robert Russell (Department of Economics)
Chandra Varma (Department of Physics and Astronomy)