

School of Biological Sciences

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Spring 2014



THE LECTURE SERIES AND ITS PURPOSE

The R. Omar and Evelyn Rilett Family Life Sciences Lecture Series was established in April 2007. It recognizes Dr. Rilett's vision and leadership, which built a Department of Biological Sciences at Illinois State University that advanced education in the natural sciences, fostered scholarly endeavors, and nurtured the development of research to the benefit of all who chose to teach and learn at this institution. The purpose is to bring outstanding life scientists and lectures to Illinois State University to benefit academic and local communities.

—presents—

R. Omar and Evelyn

Rilett Family

Life Sciences Lecture Series

Co-Sponsored by the

School of Biological Sciences,
Phi Sigma, and Provost Office
at Illinois State University

Dr. Jan-Marino Ramirez



Professor for Neurological Surgery and Pediatrics
Physiology and Biophysics
University of Washington,
School of Medicine Director,
Center for Integrative Brain Research
Seattle Children's Research Institute

March 20, 2014 7:00 P.M.

Prairie Room

Bone Student Center

Illinois State University

LECTURE SERIES PROGRAM

WELCOME

Dr. David Rubin

School of Biological Sciences

HISTORY OF LECTURE SERIES

Dr. Craig Gatto

Director, School of Biological Sciences

INTRODUCTION OF SPEAKER

Dr. Wolfgang Stein

School of Biological Sciences

PRESENTATION

“From Neurobiology to the bedside: How basic sciences influences our understanding of human diseases”

This lecture will discuss how basic neurobiological research can lead to important discoveries in the field of Medicine. I will use examples from my own research career, which began as a biologist studying insect behavior for more than a decade. The talk will describe principle mechanisms how neuronal networks generate brain activity, and how the understanding of these principles will help us in treating neurological disorders. I will focus on the neuronal network that controls breathing, and describe the mechanisms that give rise to the generation of different forms of breathing. The audience will learn for example how the brain generates a sigh, but also how disturbances in this network can lead to Sudden Infant Death Syndrome, Obstructive Sleep Apnea and other cardiorespiratory diseases. Similar approaches to understand network mechanisms have helped us unravel mechanisms that underlie various other neurological disorders including epilepsy and ADHD.

Highlights of Dr. Jan-Marino Ramirez’s career, thus far:

Current:

Dr. Ramirez has a general research interest in the neural control of rhythmic activity. In particular, he studies neural mechanisms involved in the generation of respiratory rhythms. His current work is focused on hypoxic effects on mammalian respiratory neural networks, facilitating novel ways to treat and cure neurological disorders in children, including epilepsy, Rett syndrome, and sudden infant death syndrome. Dr. Ramirez's laboratory is particularly interested in understanding developmental alterations of the cellular properties of nerve cells in the respiratory network. His work is supported by multiple National Institutes of Health (NIH) awards.

Education:

- M.Sc in Biology, University of Regensburg, Germany in 1983
- PhD in Biology *summa cum laude*, University of Regensburg, Germany in 1986
- Post-doctoral fellow in Physiology, University of Alberta, Canada, 1986-1991
- Junior Faculty and Habilitation in Zoology, University of Gottingen, Germany in 1994

Faculty Appointments:

- Assistant Professor in Organismal Biology & Anatomy at the University of Chicago in 1996
- Promotion to Professor at the University of Chicago in 2004
- Chair of the Department of Organismal Biology & Anatomy at the University of Chicago in 2006
- Professor of Neurological Surgery and Pediatrics and Director of the Center for Integrative Brain Research at the Seattle Children’s Research Institute in 2008
- Research Affiliate at the Center on Human Development and Disability at the University of Washington in 2008

Awards and Honors:

- Alberta Heritage Foundation for Medical Research and the Medical Research Council of Canada to pursue postdoctoral research
- Helmholtz Scholarship from the Germany Ministry of Science and Technology
- Heisenberg Scholarship from the German Science Foundation
- Alberta Heritage Foundation for Medical Research Visiting Professor at the Universities of Calgary and Alberta
- Member of the Scientific Advisory Board of the International Rett Syndrome Association
- Associate Editor for the Journal of Neurophysiology

Grant Funding:

- National Institutes of Health

Publications:

- Dr. Ramirez's efforts have generated over 80 peer-reviewed publications. Examples include:
- Zanella S, Doi A, Garcia AJ 3rd, Elsen F, Kirsch S, Wei AD, Ramirez JM. (2014). When norepinephrine becomes a driver of breathing irregularities: how intermittent hypoxia fundamentally alters the modulatory response of the respiratory network. *J Neurosci.* 34(1):36-50.
 - Ramirez JM, Mitchell GS. (2013). Clinical challenges to ventilatory control. *Respir Physiol Neurobiol.* 189(2):211-212.