



# Department of Physiology

David Geffen School of Medicine at UCLA

It is a pleasure to update you on the Department of Physiology in the David Geffen School of Medicine at UCLA. The department continues to be a widely recognized leader in the field of physiology, including our renowned research in membrane physiology and biophysics, cellular and molecular imaging, cardiovascular physiology, neurophysiology, and gastrointestinal physiology. The primary faculty have obtained over \$9.2 million in extramural grant support for fiscal year 2017-2018.

Two assistant professors were recruited to the Department in 2018. **Dr. Lindsay De Biase** studies microglia, the macrophage-like cells of the CNS, and is defining the causes and consequences of regional specialization of microglia in the basal ganglia. **Dr. Laura DeNardo** studies cortical circuit organization and functional connectivity in development and with adaptive changes in behavior. Another faculty search is planned for 2019.

We continue to take an active role in educating the next generation of physiologists and clinicians. Our primary faculty members are mentoring 4 graduate students and 12 postdoctoral scholars during the 2018-2019 academic year. Three students received support from the Jennifer S. Buchwald Graduate Fellowship in Physiology: Joslyn Soto (NSID / Khakh Lab), Eunice Ng (MCIP Radu Lab Ophthalmology), and Jessica Nevarez-Mejia (MCIP, Reed Lab Pathology).

We remain heavily involved in both instructional and leadership capacities in the medical and dental school curricula. Three of our faculty are course chairs, and Dr. Cannon serves on the Curriculum Redesign Steering Committee. The Physiology Teaching Lab remains a popular and informative component of the medical and dental curricula. Simulation labs are now conducted in the state-of-the-art Geffen Hall, and equipment upgrades have enhanced the human performance labs (CV, pulmonary, and nerve conduction) held on CHS-5.

## 2018 Faculty Highlights

**Dr. Jeff Abramson** published new insights on ligand-induced conformational changes in sodium-dependent sugar transporters (PNAS) and developed a new technique based on photo-induced electron transfer (DEPET) to determine nm-scale intermolecular distances (Nat Comm with **Dr. Riccardo Olcese**).

**Dr. Steve Cannon** developed a new system to study CaV1.1 in oocytes (JGP) was the plenary speaker at Channelopathies 2018.

**Dr. Tamir Gonen** established Micro Electron Diffraction at UCLA, which has been exceptionally productive with new structures published in Science, Nat Struct Mol Bio (x3), Nat Chem, and ACS Cent Sci. Dr. Gonen's extension of MicroED to determine the structure of small molecules (e.g. drugs) in addition to proteins was selected as one of the **top 8 candidates for Breakthrough of the Year by Science**. Chair elect, American Crystallographic Assoc. - ED

**Dr. Yousang Gwack** awarded a new R21 grant and was promoted to Professor of Physiology.

**Dr. H. Ron Kaback** published as series of PNAS papers showing remarkable conformational flexibility of lactose permease at the substrate binding site. Stay tuned for new insights on the strange pKa of Glu325.

**Dr. Baljit Khakk** was named an **Allen Institute Distinguished Investigator**, awarded a new R01 Award, and published two papers in Neuron on a new optical tool to study glia-neuron interactions and discovered a role for glia in obsessive-compulsive disorder.

**Dr. Tom O'Dell** showed spontaneous NT release at an excitatory synapse is Ca-dependent, but not by stochastic activation of CaV channels (J. Neurosci). Dr. O'Dell collaborated on a study showing Rbfox1 (implicated in epilepsy and autism) regulates vSNARE expression (vamp1) in inhibitory neurons (Neuron).

**Dr. Diane Papazian** received a research grant from the National Ataxia Foundation. Dr. Papazian also serves as Vice Chair of the Council on Academic Personnel.

**Dr. Peipei Ping** is the PI of a new T32 training grant "Discover: integrated data science training in cardiovascular medicine". Dr. Ping published in Nature Communications on integrated "omics" in cardiac remodeling.

**Dr. Hui Sun** started a new company to identify and develop potent inhibitors of pathologic angiogenesis, based on the elusive PEDF receptor discovered in his lab.

**Dr. Nancy Wayne** is on sabbatical in the American Council on Education Fellows Program.

**Dr. Ernest Wright** published in Nature Communications on the binding site for the new SGLT2 drugs used to treat type 2 diabetes. Dr. Wright also contributed several papers on the use of SGLT2-ligands for PET-based detection of malignancy.

In addition, Drs. Bal Khakh and Tom Vondriska direct the UCLA Physiology Outreach Program (POP) aimed at providing an in-depth and high-quality summer research experience for high school students, including those from underserved communities. Seven Los Angeles high school students took part in Physiology research over the summer in 2018. We are online and seek collaborators and modest funds to support the program (<http://uclapop.org/>).

### 2018 Trainee Highlights

**Ms. Joselyn Soto** (graduate student Khakh lab) NSF Graduate Fellowship 2018-2022.

**Dr. Jinming Ma** (Gonen Lab) appointed a tenure track faculty position at Anhui Univ (China).

**Dr. Jun Nagai** (Khakh lab) received the Ben Barres Trainee Award (Cold Spring Harbor Labs 2018).

**Dr. Xinzhu Yu** (Khakh lab) received a BRI Postdoctoral Award.

Physiology is a unique discipline in the life sciences, in that it seeks to understand biological functions from the level of atomic-scale mechanisms all the way to whole organisms. There is no other area in biology that is as cross-disciplinary in nature, or one that has such a high potential for advancing the treatment of human diseases. **Our mission is to advance the frontiers of physiological sciences through excellence in research, training of students and fellows, and application of this knowledge to promote advances in our understanding, diagnosis, and management of human disease.**

We encourage you to visit our webpage for more information about the department (<http://www.physiology.ucla.edu>). If you want to be more involved or want to know more about the department's research, then please contact individual faculty. We very much look forward to sharing our latest breakthroughs with you.

In looking forward, we aim to increase private support in ways that will ensure continued excellence in research and education – and achieve our objectives. We need help from friends of the Department to meet our philanthropic goals. We have three funds/endowments.

- **Ernest M. Wright Fund**, established in 2011 to support deserving junior faculty members' research programs for up to five years; the fund will convert

to an endowment when the \$500,000 goal is reached.

- **Department of Physiology Chairman's Fund**, to provide research and educational support at the discretion of the chair.
- **Jennifer S Buchwald Graduate Fellowship in Physiology**, to provide support for graduate students in their first year in the Department; Dr. Buchwald-Baerwald recently provided significant additional funds to the endowment.

*Leave a Legacy:* Charitable gifts made through your estate are a wonderful way to provide lasting support for UCLA and the Department of Physiology. A bequest can help meet your estate planning goals, while minimizing taxes and conserving more of your assets for loved ones. Estate gifts can be funded with cash, securities, real estate, or other property.

**Can you help with a donation?** Please go to the Physiology secure online giving page, located at <http://giving.ucla.edu/physiology>. Alternatively, make a check payable to The UCLA Foundation; include Department of Physiology and the name of the fund in the reference line, and mail to

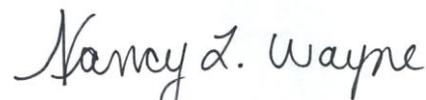
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Please feel free to contact us to discuss any aspect of the Department and the possible use of any donations. Your partnership is very much appreciated.

Warm regards,



Stephen Cannon, M.D., Ph.D.  
Professor and Chair



Nancy L. Wayne, Ph.D.  
Professor and Donor Liaison

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