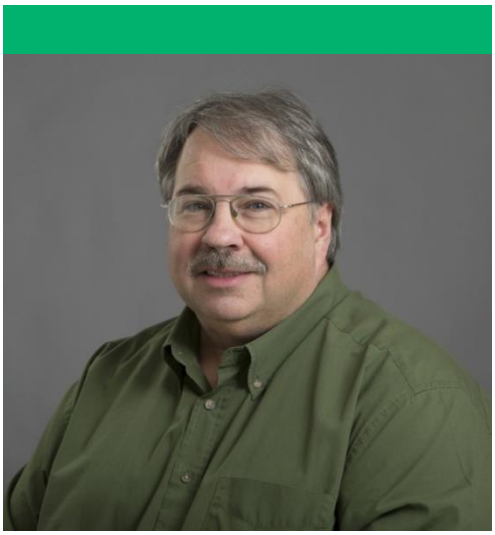
RUSH

Michael Fill, PhD

The Francis N. and Catherine O. Bard Professor of Physiology



Advancement of Medicine

This year, your generous support has continued to fuel basic science preclinical research aimed at advancing care. We are defining mechanisms governing acid-base balance, various cardiac arrhythmias and skeletal muscle myopathies as potential targets for future therapeutic interventions.

The majority of funds were used to support the salaries of multiple research faculty members (excluding me) in the Department of Physiology & Biophysics. Some funds were also used to purchase vital research lab supplies.

Grants

I continue to serve as co-principal investigator, with **Dirk Gillespie, PhD**, on an R01 grant from the National Institutes of Health for our project titled "Collective Ryanodine Receptor Operations at Release Sites." The project aims to improve our understanding of cardiac arrhythmia to ultimately prevent and treat this potentially deadly condition. We know abnormal intracellular calcium release may trigger heart arrhythmias that can lead to sudden death. This project examines why this abnormal calcium release occurs and explores therapeutic strategies.

Publication Highlights – Abbreviated

Below is a partial list of research publications made possible, in part, by the endowment:

- SERINC5 co-expressed with HIV-1 Env or present in a target membrane destabilizes small fusion pores leading to their collapse. Markosyan RM., Marin M. and GB Melikyan. *mBio,* 2025.
- Transcendent Aspects of Proton Channels. TE DeCoursey. *Annual Review of Physiology*, 2024

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The Year Ahead: 2026 and Beyond

Funds will be instrumental in continuing to advance the basic preclinical research activities in the Department of Physiology & Biophysics that I've outlined in this report.

With Gratitude

To the donors of the endowed Francis N. and Catherine O. Bard Professorship of Physiology, **thank you**. With your enduring support, we are uncovering the physiological mechanisms of disease with the goal of turning those insights into lifesaving therapies.