

BIOENGINEERING

SEMINAR SERIES

Yvon Woappi, Ph.D.

Herbert and Florence Irving Assistant Professor

Department of Physiology & Cellular Biophysics

Department of Dermatology

Department of Biomedical Engineering

Columbia University

April 25th, 2024

12:30 – 1:00 PM Coffee/Pastry Mixer

1:00 – 1:50 PM, Foege N130

live stream: <https://washington.zoom.us/j/94375637567>



“Systems Bioengineering for Skin Wound Healing at Scale”

ABSTRACT: Large-scale tissue damage, such as trauma-related injuries, age-related degeneration, and organ failure, is a leading cause of morbidity and death. However, the mechanisms underlying full regeneration of mammalian organs remain poorly understood. As the largest organ system in the body, the integumentary system is a composite tissue assembly evolutionarily adapted for healing. Consequently, its complex physiology requires multifaceted cooperation between several distinct cell populations and cell lineages of embryologically distinct origins. Equally integrated within this dynamic process are local immune responses that produce mitogenic and inhibitory signals throughout the restoration procedure. There remains a significant gap in understanding how these processes are regulated and how various cell populations of varied developmental origins functionally cooperate to repair mammalian tissues at the organ scale. Our laboratory employs a systems bioengineering approach that manipulates the intricate genetic makeup of distinct cell groups within the integument to enhance its regenerative potential. We aim to rewire the very building blocks of tissues by genetically orchestrating large-scale cellular renewal within them. This seminar will detail our advances in these efforts and the novel technologies we’re currently developing to redefine the possibilities of regenerative medicine for patients.

BIO: Dr. Yvon Woappi is an Assistant Professor of Physiology and Cellular Biophysics, and the Endowed Herbert and Florence Irving Assistant Professor of Dermatology in the Vagelos College of Physicians and Surgeons at Columbia University. He equally holds a tertiary appointment in the Department of Biomedical Engineering at the Fu Foundation School of Engineering and Applied Science at Columbia University. Yvon earned his B.S. in Biology from the University of Pittsburgh and his Ph.D. in Biomedical Sciences as a Grace Jordan McFadden Fellow under Lucia Pirisi-Creek at the University of South Carolina School of Medicine. His doctoral work helped characterize the relationship between epithelial regeneration and virus-induced neoplasia and laid the groundwork for synthetic regeneration, the research concept he is currently pursuing in his independent lab. Yvon went on to complete his postdoctoral training in the Harvard Dermatology Research Training Program at Harvard Medical School and Brigham and Women’s Hospital where he developed cell manipulation systems to study the epigenetics of skin epidermal plasticity *in vivo*. His postdoctoral work was awarded the NIH K99/R00 pathway-to-independence MOSAIC award to advance his research on skin stem cell biology and regeneration. He joined the faculty at Harvard Medical School in 2021 as an Instructor of Dermatology, then transitioned into his Assistant Professorship in the Fall of 2022 at Columbia University. He is currently the director of the Synthetic Regeneration and Systems Physiology Laboratory at Columbia. Yvon’s research accomplishments have earned numerous distinctions, prizes, and awards, including the MIT Rising Star Award and designation among the “1000 Inspiring Black Scientists in America” by Cell Press News and the Community of Scholars. Yvon is also an inaugural recipient of the NIH MOSAIC fellowship from the National Institute of General Medical Sciences, and is an ardent proponent of inclusive excellence.