



# NEW ENGINEERING MECHANISMS TO OPEN THE FRONTIERS OF CELLULAR AND MOLECULAR BIOLOGY

※This lecture will take place during the same time slot as Prof. Sethu's.

## JOSEPHINE GALIPON

### ► Abstract

Major scientific discoveries happen hand in hand with engineering. As such, it is essential for fundamental scientists to develop an engineering mind to avoid becoming defined by the limitations of current technology. In this talk, several engineering innovations at the frontier of both engineering and biology fields will be presented. First, a novel robotic microscope stage with three rotational axes realizing not only 3D imaging from all directions, but also positional tracking of living organisms will be described. Second, this concept of observing the response of a live animal response under various stimuli is expanded to the fixing of whole living organisms at the end of a robotic arm, acting as a biological end-effector. The future implications of this novel concept will be discussed. Finally, enabling state-of-the-art molecular biology outdoors in remote fieldwork locations to study living organisms in their natural habitat is essential to gain a thorough understanding of the fundamental mechanisms of life. We envision a future where molecular biology will be merged with field robotics, an undertaking that will enable further incredible discoveries in both fields. In contrast with engineering serving biology or biology-inspired engineering, we believe that mechanisms that are totally novel from the point of view of both engineering and biology are the key forward.

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OCT 28, 2024 2:30–5:30 PM  
Lecture Room 2, Basic Medical  
Research Building 3F



EXT 2957



Shimoda's Laboratory  
Medical science Reserch Building 3