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*Bacteria as actuators for hybrid (biotic/  
abiotic) swimming micro-robots*

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4:00 P.M.

304 Robeson

Mobile micro-robots have unique advantages, such as the ability to access small spaces, and the potential to be employed in large numbers as inexpensive agents of distributed systems for swarm robotic applications. Due to these characteristics, micro-robots are envisioned to impact a diverse range of applications, including minimally invasive diagnosis and localized treatment of diseases, environmental monitoring, and homeland security. While the potential impact of these systems is high, particularly for biomedical applications, many challenges remain in developing such microrobots. One of most significant obstacles to realization of mobile robots at micron length scales are the miniaturization of on-board actuators and power sources required for mobility. To address these problems for swimming micro-robots, we focus on interfacing live microorganisms (i.e. bacteria) with a microfabricated robot body, with the ultimate goal of using bacteria for actuation, control, and sensing. This talk will describe analytical and experimental research efforts on both propulsion and on/off motion control of bacteria-propelled synthetic micro-objects. Future directions, specifically efforts to facilitate localized delivery of the control agents to enable independent control of each micro-robot will also be discussed.