

# AEROSPACE & MECHANICAL ENGINEERING



**2012 COLLOQUIUM 2013  
SEMINARS ARE OPEN TO THE PUBLIC**

**UNIVERSITY OF NOTRE DAME, NOTRE DAME, INDIANA 46556**

**SPEAKER:** **Dr. Tara L. Deans**  
Department of Biomedical Engineering  
Johns Hopkins University  
Baltimore, Maryland

**TOPIC:** **ENGINEERING BIOMATERIALS AND TISSUES TO CONTROL  
SYNTHETIC GENE NETWORKS**

**DATE:** Friday, February 22, 2013

**TIME:** 2:45 p.m.

**PLACE:** Lower Level Auditorium, Geddes Hall

**RECEPTION:** 2:00 – 2:30 p.m. – 365 Fitzpatrick Hall

## ***ABSTRACT***

The rapidly emerging field of synthetic biology originated in simple model organisms such as yeast and bacteria. However, as synthetic biology has expanded into mammalian systems, it is increasingly more important to consider the complex environments in which these cells are grown. Biomaterials will play an important role in advancing synthetic biology to mammalian systems because they provide a three-dimensional (3D) environment where cells can behave as they do *in vivo*, in addition to organizing and delivering therapeutic cells to locations of interest *in vivo*. In this talk I will present a multidisciplinary approach interfacing synthetic biology and biomaterials to activate and control genetic circuits in 3D scaffolds. Using this approach, it is possible to locally and systemically induce synthetic circuits for the spatial and temporal control of gene expression by engineering new materials for the passive and controlled release of genetic inducers. Furthermore, I will demonstrate how interfacing synthetic biology and biomaterials can be used to engineer *synthetic tissues*, which are tissues programmed with alternative functions. Together, this approach offers a unique platform for mimicking cellular microenvironments, in addition to providing mechanisms for translating synthetic biology for clinical applications.

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**NOTE:** *If you are interested in meeting individually with Dr. Deans, please contact Linda at 631-5431*