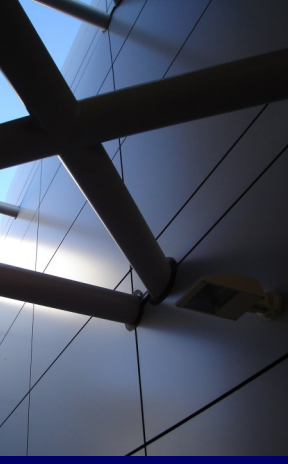

COLLOQUIUM
MECHANICAL ENGINEERING

*The Department of Mechanical Engineering presents:*

**Dr. PRASHANTHI VANDRANGI, Post-doctoral Researcher, ME, BIEN, MSE**
**& SHANNON GOTT, PhD Student, ME**

## Friday, January 24, 2014, 11:10AM-12:00PM
## Winston Chung Hall 205/206

# Shannon Gott

### Vascular Stents with Rationally-Designed Sub-Micrometer Scale Surface Patterning

***Abstract:***
Drug-eluting stents have revolutionized the field of interventional cardiology by reducing incidence of restenosis through local delivery of drugs that inhibit inflammation caused by implantation-induced injury. However, growing evidence suggests that this may also inhibit reestablishment of the endothelium, thus delaying healing and increasing potential for thrombogenic stimulus. Herein, we discuss our recent progress towards realization of next-generation titanium (Ti) stents that seek to mitigate adverse physiological responses to stenting via rational design of stent surface topography at the micro- and nanoscale.

Specifically, we discuss: 1) advances which now allow patterning of features in Ti substrates down to 150 nm, which represents the smallest features achieved to date using our novel Ti deep reactive ion etching (Ti DRIE) technique; 2) creation and evaluation of balloon-deployable, cylindrical, surface-patterned stents from micromachined planar Ti substrates; and 3) integration of these processes to produce a device platform that allows, for the first time, evaluation of surface patterning in more physiologically relevant contexts, e.g. in vitro organ culture. Using elasto-plastic finite element analysis, we also explore the feasibility of planar stents with novel locking mechanisms intended to address radial stiffness deficiencies observed in our earlier studies. Collectively, these efforts represent key steps towards our long-term goal of developing a new paradigm for stents in which rationally-designed surface patterning provides a physical means for complementing, or replacing, current pharmacological interventions.

***Biography:*** Shannon Gott graduated from Walla Walla University in 2009 with a Bachelor's Degree in mechanical engineering and is currently pursuing a PhD in mechanical engineering from the University of California, Riverside as an NSF Fellow. Seeking to overcome some of the current limitations with cardiovascular stents, her current focus is on the design, fabrication, and mechanical testing of a novel, titanium-based stent.