

# MSE SEMINAR

April 14, 2017  
113 McBryde Hall  
3:30 – 4:30 PM  
Refreshments at 3:00 PM

## *Shelley Cooke*

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## **“Investigation into the stability of biomedical grade polyurethane and silicone exposed to ionizing radiation at low doses”**

### **Abstract**

Limited research is currently available on the stability of biomedical grade materials under radiation in aqueous conditions. However, some studies suggest medical devices can fail with prolonged exposure to radiation in an *in vivo* environment. As the number of implanted devices and exposure to radiological exams/radiotherapy increases it is essential implanted materials are fully investigated at varying doses and dose rates. This study investigated two materials, polyurethane and silicone, under low doses of radiation (0-80Gy) and varying aged gamma sources (0.1 – 21yrs at 25kGy). Early results indicate at low radiation doses both polyurethane and silicone maintain chemical and basic thermal stability while altering early cellular responses. At higher doses (80Gy), cell count is significantly higher than other doses, suggesting material surface changes are influencing cells. This data provides valuable insight into initial reactions between ionizing radiation at low doses and biomedical grade polyurethane and silicone.

### **Biosketch**

Shelley Cooke is currently pursuing a Ph.D. in Materials Science and Engineering. She received her B.S in Materials Engineering from California Polytechnic State University in 2011 and a master's in Materials Science and Engineering from Virginia Tech in 2013. Her research interests include understanding and investigating synthetic biomaterials for clinical applications and improving upon current medical processes. She is advised by Dr. Abby R. Whittington.