CHEMICAL, BIOLOGICAL & MATERIALS ENGINEERING

100 E. Boyd, Sarkeys Energy Center, T-335 405-325-5811 The University of Oklahoma Norman, Oklahoma 2011 – 2012 Seminar Series

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DR. GILDA BARABINO

PROFESSOR AND ASSOCIATE CHAIR OF GRADUATE STUDIES
THE WALLACE H. COULTER DEPARTMENT OF BIOMEDICAL ENGINEERING
GEORGIA INSITUTE OF TECHNOLOGY AND EMORY UNIVERSITY
ATLANTA, GEORGIA

Will present a seminar on

"ENVIRONMENTAL EFFECTS ON TISSUE-ENGINEERED CARTILAGE"

Current therapies for defects in articular cartilage, the load-bearing lining of diarthrodial joints, are hampered by the avascular nature of cartilage and its limited ability for self-repair and regeneration. The use of bioreactors for the in vitro generation of cartilage tissue using chondrocytes seeded on scaffolds is a promising approach for the development of viable cartilage substitutes. The hydrodynamic environment within bioreactors has been shown to influence matrix composition, morphology, and mechanical properties of engineered tissue constructs. We have employed a wavy-walled bioreactor with multiple well-defined hydrodynamic zones to better understand the complex interplay between hydrodynamic, biochemical and biomechanical environments and their relationship to biochemical, histological, and mechanical engineered tissue properties. For example, the level of shear in the presence or absence of growth factors and media supplements was found to modulate the thickness of the fibrous capsule that typically characterizes cartilage constructs cultivated in dynamic environments, and the thickness of the capsule impacted mechanical properties. Further, in the presence of hydrodynamic stimuli, the capsule was eliminated when serum concentration in the media was equal to or less than 0.2%. Overall, our system provides a template to better understand mechanisms involved in the interplay between mechanical and biochemical stimuli in order to enable the production of engineered cartilage with clinically relevant properties.

> THURSDAY, FEBRUARY 9, 2012 COOKIES AND COFFEE -- 2:45 P.M. SEMINAR -- 3:00 P.M. SARKEYS ENERGY CENTER, ROOM M-204

> > THIS IS A REQUIRED SEMINAR FOR CHE 5971

Accommodations on the basis of disability are available by contacting the office before the event.