

1073-92-197

**Mansoor A Haider\*** ([m\\_haider@ncsu.edu](mailto:m_haider@ncsu.edu)), Dept. of Mathematics Box 8205, NCSU, Raleigh, NC 27695-8205. *Mixture models for cartilage tissue engineering using cell-seeded scaffolds.*

Mixture models are presented for interactions between biosynthesis of extra-cellular matrix (ECM) constituents and ECM linking in biomaterial scaffolds seeded with cartilage cells (chondrocytes). Both ODE-based (temporal) models for evolution of average apparent densities and PDE-based (spatio-temporal) models will be presented for variables including unlinked ECM, linked ECM and scaffold. Effects of parameter variations on model variables are analyzed relative to baseline cases. Of particular interest is the evolution of solid phase apparent density, which is often correlated with the compressive elastic modulus of the tissue construct. These models provide a quantitative framework for assessing and optimizing the design of engineered cell-scaffold systems and guiding strategies for articular cartilage tissue engineering. (Received August 01, 2011)