

The Materials Science and Engineering Department**welcomes****Dr. Mary Cowman***Professor and Associate Dean for Bioengineering
Tandon School of Engineering, New York University***Biomarkers and Biotherapeutics Based on Cell-Biomatrix Interactions**

The glycosaminoglycan hyaluronan (HA) is a key component of the microenvironment surrounding cells. In healthy tissues, HA molecules have extremely high molecular weight and large hydrodynamic volumes. The molecules overlap and interpenetrate, creating a viscoelastic network. The mechanical properties of the extracellular matrix, tissue hydration, and receptor-ligand interactions are strongly affected by the presence of HA.

In inflammation, reactive oxygen and nitrogen species fragment the HA chains. Depending on the rate of chain degradation relative to the rates of new synthesis and removal of damaged chains, short fragments of the HA molecules can be present at significant levels. Not only are the physical properties of the extracellular matrix affected, but the HA fragments act as endogenous danger signals. Analysis of the extent

of HA fragmentation can be utilized in medical diagnostic and prognostic tests. In addition, control of receptor interactions with HA fragments is leading to new therapeutic approaches to wound healing and cartilage repair without fibrosis.

