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Recovery of Elasticity of Aged Human Epithelial Cells *In-Vitro*
IGOR SOKOLOV, SWAMINATHAN IYER, Dept. of Physics, Clarkson University, CRAIG WOODWORTH, Dept. of Biology, Clarkson University — We recently found a considerable increase in rigidity of human epithelial cells during ageing *in-vitro*. This is important because the loss in elasticity of epithelial tissues with ageing contributes to many human diseases. We also found that cultured cells had three distinct regions of rigidity, and that the increase in rigidity correlated with an increase in density of cytoskeletal fibres. However, it was not clear which type of fibre was important. Atomic Force Microscopy (AFM) and imunofluorescence microscopy were used in this study to characterize aging human epithelial cells in vitro, both before and after treatment with cytochalasin B. We found that the fibres associated with increased rigidity were mostly F-actin microfilaments. Furthermore, using cytochalasin B, a chemical that inhibits polymerization of F-actin, we restored the rigidity of old cells to the young level in all three areas of rigidity simultaneously. In conclusion, these results clarify how the cell mechanics changes during aging *in vitro*, and they may be relevant for treatment of age-related loss of elasticity in epithelial tissues. The trials of this new treatment are in progress.

Igor Sokolov
Clarkson University

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