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Electrostatic perturbation in neurons and endothelial cells under stress using Atomic Force Microscopy-assisted Electrostatic Nanolithography VICTORIA NEDASHKIVSKA, SERGEI LYUKSYUTOV, The University of Akron, LOIS-MAY BEZUIDENHOUT, CORNELIS VAN DER SCHYF, NEOUCOM — The morphological and membrane properties of neuronal and vascular endothelial cells need to be studied to reveal their possible role in neurodegeneration after injury. Atomic Force Microscopy Electrostatic Nanolithography (AFMEN) offers an opportunity to measure cellular perturbations during stress conditions. AFMEN is based on electrostatic manipulations of macromolecules and biological tissues at a nanoscale level which generates electric fields of the order of magnitude 10^8 - 10^9 V m⁻¹ and studies membrane changes in *in vitro* cell culture systems. Two cell culture systems were selected based on their ability to represent neurons on the one hand, and vascular epithelial cells differentiated to model the blood-brain barrier, on the other. The imaging was completed for cells in wet (natural) and also in dry conditions. Changes in membrane behavior will be compared between stressed cells and controls that have not undergone exposure to pathologic conditions.

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