Selective Label-free Electrokinetic Cell Tracker (SELECT): a novel liquid platform for cell characterization RAJESHWARI TARUVAI KALYANA KUMAR, IZABELLE DE MELLO GINDRI, DAVID KINNAMON, PRADYOTHA KANCHUSTAMBHAM, DANIELI RODRIGUES, SHALINI PRASAD, University of Texas at Dallas, BIOMATERIALS FOR OSSEOINTEGRATION AND NOVEL ENGINEERING LAB COLLABORATION — Characterization and analysis of rare cells provide critical cues for early diagnosis of diseases. Electrokinetic cell separation has been previously established to have greater efficiency when compared to traditional flow cytometry methods. It has been shown by many researchers that buffer solutions in which cells are suspended in, have enormous effects on producing required dielectrophoretic (DEP) forces to characterize cells. Most commonly used suspension buffers used are deionized water and cell media. However, these solutions exhibit high level of intrinsic noise, which greatly masks the electrokinetic signals from cells under study. Ionic liquids (ILs) show promise towards the creation of conductive fluids with required electrical properties. The goal of this project is to design and test ILs for enhancing DEP forces on cells while creating an environment for preserving their integrity. We analyzed two methylimidazolium based ILs as suspension medium for cell separation. These dicationic ILs possess slight electrical and structural differences with high thermal stability. The two ILs were tested for cytotoxicity using HeLa and bone cells. The effects of electrical neutrality, free charge screening due to ILs towards enhanced electrokinetic signals from cells were studied with improved system resolution and no harmful effects.

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