

# Micro-electrodes based on CMOS Technology for Characterization of Biological Cells

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## Abstract

The electro-rotation configuration is one of the most important characteristics that is achieved through the Dielectrophoresis (DEP) phenomena. Furthermore, it is a significant property to distinguish between different biological cells. At a given frequency, the rotation speed and rotation direction of the biological cells are different from one cell to another based on the biological characteristics. There are many proposed designs for implementing the electro-rotations. In this paper, a comparison between these different designs are studied and simulated to propose the efficient technique that can be applied to obtain a sensitive and an accurate biological cell electro-rotation. This comparison is studied through introducing 3D simulation results using finite element method (FEM) technique. This study used the following parameters to differentiate between the techniques: the electro-rotation direction and the generated electric field density and distribution around the electrodes, in addition to the generated DEP force on particles.

*IEEE International Symposium on Signal Processing and Information Technology (ISSPIT) 2019, December*