

Last Name (print): _____ First Name (print): _____

WORKSHOP 4 - YCL
Dielectrophoresis, February 4, 2014

There are many different ways to sort cells. See Nicole Pamme’s “Continuous flow separations in microfluidic devices,” Lab Chip, 2007, 7, 1644–1659, for a review. For example, the use of dielectrophoresis (DEP) shown below is a powerful approach. It can sort nano-particles based on their dielectrophoretic properties, e.g. capacitance. Nanoparticles with different capacitances were demonstrated as shown in the second figure below. Propose an approach to apply DEP to accomplish ^{pos}CTC-iCHIP and ^{neg}CTC-iCHIP in one operation. Use backside of the paper to present your proposal.

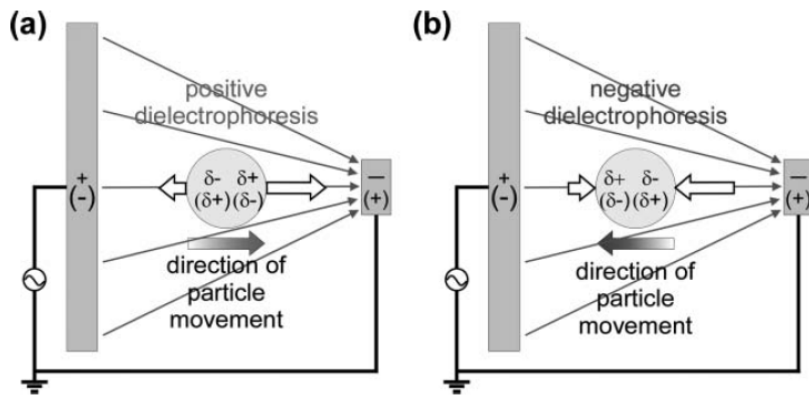


Fig. 9 The principle of dielectrophoresis (DEP): when subjected to an electric field, a particle or cell becomes polarised. If the electric field is inhomogeneous, then the electrostatic forces on the two ends of the dipole are not equal and a movement is induced. (a) Positive DEP occurs when the particle exhibits a larger polarisability than the surrounding medium. Positive DEP is directed towards the stronger electric field. (b) Negative DEP occurs if the particle is less polarisable than the surrounding buffer medium. Negative DEP forces the particle away from areas of high field intensity towards areas of low intensity. Figure redrawn from ref. 63 with permission from Elsevier.

