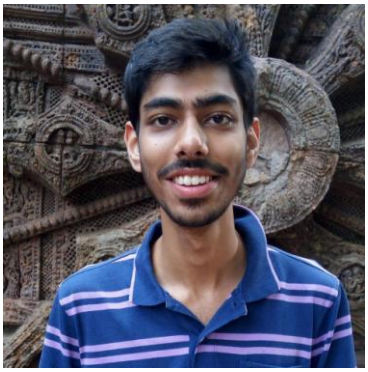
Study the Effect of pulsed electric field on electro-permeability of HeLa cells



Electroporation is an efficient technique to increase the permeability of cell membrane allowing chemical,drugs or DNA to be inserted inside the cells.In the initial stage, propidium iodide and conducting quantum dots (CNDs) were used for checking the permeability of cells. .In the present study HeLa cells were electroporated using positive pulses with pulse width of 1µs and time period of 100µs for 30 seconds duration of time It was observed that both CNDs and propidium iodide was successfully been injected in the HeLa cells using positive pulses. The viability of the cells were decreased with increasing pulse period. We achieved good viability of cells in case of our optimised parameters.We made a very simple arrangement of electrodes using stainless steel-Grade-316L.Each electrode was 5mm in width and touching the bottom of 48 well culture plate.The electrodes were connected to the arbitrary waveform generator(scientiFic SMG1032X) and positive pulses were applied to the cells adhered in different wells of 48 well culture plate.

Result from this work indicated that it is possible to increase the permeability of cell membrane with external electric field and maintaining high cell viability at the same time.Different other systems can be fabricated in the future study to be inserted into the cells using the concept of electroporation.We can tag different antibodies or DNA vaccines with the particles which opens new horizons in the field of therapeutics.We can use magnetic particles attached to a biocompatible polymer with which we can tag specific drugs for the target tissue.Those magnetic particles can be navigated inside the body using magnetic field.Thus using basic concepts of magnetic and electric fields we can increase the efficiency of any medical treatment.In vivo experiments can be performed using a piezoelectric material which can induce electric field by application of mechanical waves such as ultrasound.