Somatic cell reprogramming by transfection with liposomal agents
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The induction of pluripotent stem cells from differentiated, somatic cells by genetic reprogramming with the transcription factors, Oct3, Sox2, c-Myc and Klf4\textsuperscript{1} has given rise to new aspects in stem cell research and gene therapy by enabling the circumvention of legal and ethical issues involved in the use of embryonic stem cells. However, the use of retroviruses as transfection agents also raises questions concerning the application of these reprogrammed cells in gene therapy for patients due to the possible increase in tumor occurrence through viral agents. In the search for an effective, alternative method for transfecting cells, we first attempted to transfect these plasmids with the usage of liposomal transfection agents into the Human Embryonic Kidney cell line, HEK 293. In our experiment, we have incubated a liposomal transfection agent with three commercially available plasmid constructs that contained the transcription factors Oct3, Sox2 and Esrrb respectively, whereas Esrrb has been reported to up regulate the expression of the genes c-Myc and Klf4\textsuperscript{2}. Each of the plasmids transfected is marked with genes coding different fluorescent proteins. After incubation with the liposome-DNA complex, cells that have incorporated the plasmids are detected by fluorescence microscopy as they express the fluorescent marker proteins coded by the plasmids. Our preliminary results show that it is possible to obtain single cells with multicolor fluorescent signals and that this method may prove to be a possible alternative to the use of retroviruses as vectors in reprogramming mature somatic cells to create induced pluripotent stem cells.

References: