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The compound FCA/X-PEI enhances DNA transfer into mammalian cells using polyethyleneimine (PEI)

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The use of cell transfection techniques, the intentional process to introducing nucleic acids (DNA or RNA) into cells, are largely used in order to observe the effects of expression or silencing of specific genes. In our project, HeLa cells (a cellular line derived from human cervical cancer cells) were transfected with pFLAG-EIF5A and pEYFP-N1 DNA plasmids using the transfection reagent polyethyleneimine (PEI), according to manufacturer's protocol (jetPEI - 101-10N Polyplus Transfection, Illkirch, France). At the same time, it was added to the cells the synthetic compound FCA/X-PEI. After incubation for 6 hours, the culture medium was replaced by fresh medium without FCA/X-PEI. After incubation for a further 18 hours, the cells were collected and the cellular extracts were analyzed by immunoblotting assays. As result, we found that the cells transfected using the combination PEI plus FCA/X-PEI showed a higher expression of the proteins of interest (eIF5A-FLAG and YFP). Finally, we confirmed by immunofluorescence and flow cytometry assays, that the use of FCA/X-PEI increases the transfection rate of pEYFP-N1. The FCA/X-PEI also has antifungal, anti-cancer and anti-HIV properties. However, there is no record in the literature that FCA/X-PEI improves the transfection capacity of PEI, confirming the originality of this approach (patent deposited in 2016 by www.inova.unicamp.br - BR1020160113678 - Instituto Nacional da Propriedade Industrial). It is important to mention that the cellular nucleic acids transfer is a common procedure in several *in vitro* and *in vivo* researches, as well as being applied in therapeutic approaches involving gene therapy, DNA vaccines and other biotechnological approaches.