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Pathway analysis of microRNA expression in mouse embryonic fibroblast cells treated with polyethylenimine

Jung-Hua Kuo (郭榮華)*, Heng-Yu Liou (劉姮妤)

Department of Pharmacy, Chia Nan University of Pharmacy and Science, Tainan 717, Taiwan

Poly(ethylenimine) (PEI) is one of the most intensively used cationic polymers in non-viral nucleic acid delivery. Despite of great potentials of the applications in gene delivery systems, PEI has been shown to influence the regulations of gene expression *in vitro* and *in vivo*. Previous studies on PEI-induced gene regulation have primarily been based on encoding mRNAs that are translated into proteins. However, recent studies have demonstrated that non-coding RNAs are closely related to complex cellular development systems and various human diseases. Among these non-coding RNAs, microRNAs (miRNAs) are approximately 22 nucleotides long and primarily play important roles in the post-transcriptional regulation of gene expression, making them potential targets for therapeutic applications. Therefore, we explored the regulated miRNAs and identified their target genes in PEI-treated mouse embryonic fibroblast cells. The pathway analysis of target genes was performed using DIANA miRPath v.3.0, which is based on the Kyoto Encyclopedia of Genes and Genomes (KEGG) database. Our study may provide a deeper insight into the molecular pathways in cells caused by PEI.