

EMBRYO MEDIATED GENE TRANSFER: POTENCIES IN AVIAN TRANSGENESISShahin Eghbalsaied¹, Hamidreza Amini²

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Animal transgenesis is of very high importance for animal scientists and pharmacologists in terms of producing pharmaceuticals and prompt genetic gain. Optimizing appropriate and efficient gene transfer strategy is the main hesitating step for making transgenic animals. Creation of transgenic mice and pigs was reported through an easy, non-chemical, non-viral, and straight forward technology, called sperm-mediated gene transfer (SMGT). However, motile sperm ability to hitchhike foreign DNAs has been challenged. On the other hand, reproducible results on making transgenic chicks through SMGT protocol have been published. If we rule out the sperm mediating pathway for transgene transfer by artificial insemination of pre-incubated sperm with exogenous DNA, the only remained scenario would be DNA uptake by embryo post-fertilization. Interestingly, common feature of the successful AI approaches in chicken SMGT is using cationic-lipids or -polymers. Documenting this theory is difficult for mammalian embryos. However, Chicken embryos are not surrounded by intact zona-pellucida barrier and develop in a naturally self-sufficient medium outside of the uterus. Such versatile characters make them the best candidate for evaluation of embryo transfection theory. Moreover, simple protein profile of chicken egg albumen is another strong privilege to target them for large scale production of recombinant proteins. Here, we overview the potencies and challenges facing chicken embryo transfection.

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