**PRIMORDIAL GERM CELL MODIFICATION USING CRISPR/CAS9 FOR GENOME EDITING IN AVES**

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Primordial germ cell (PGC) is the most promising vehicle for transgenesis and genome editing in avian species. Efficient germline transmission of PGC enable to produce transgenic chickens with introduction of viral vector or non-viral vector system, and programmable genome editing tools such as clustered regulatory interspaced short palindromic repeats (CRISPR)-CRISPR-associated protein 9 (Cas9) are also successfully used to produce genome-edited aves with the PGC-medaited germline transmission. With the CRISPR/Cas9 technology, our group also successfully induced targeted gene disruption and targeted gene insertion in chicken cell lines, expecially in PGCs, without off-target effects. By transplantation of the genome-edited PGCs, the genome-edited chicks were produced, and genomic DNA analysis revealed that the chicks have exogenous gene cassette in the targeted locus. Our results suggest that PGC-mediated genome editing technology using CRISPR/Cas9 system is powerful tool for genome editing in avian species, and is expected to use for develop high-valued avian lines for diverse purporses in the near future.

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