

Loss of selenoprotein W1 inhibits skeletal muscle growth and development in zebrafish (*Danio rerio*) by promoting protein ubiquitination degradation

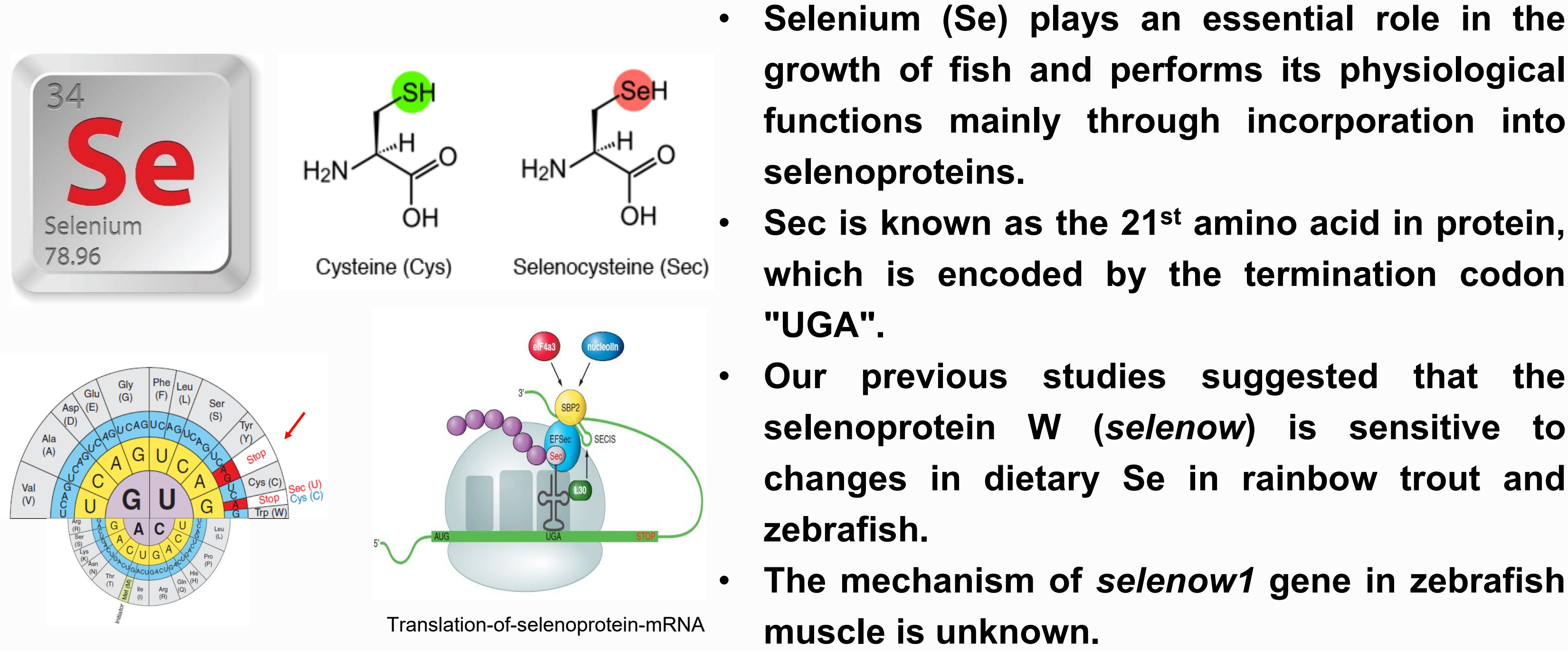
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① Background



② Construction of *selenow1*^{-/-} zebrafish model

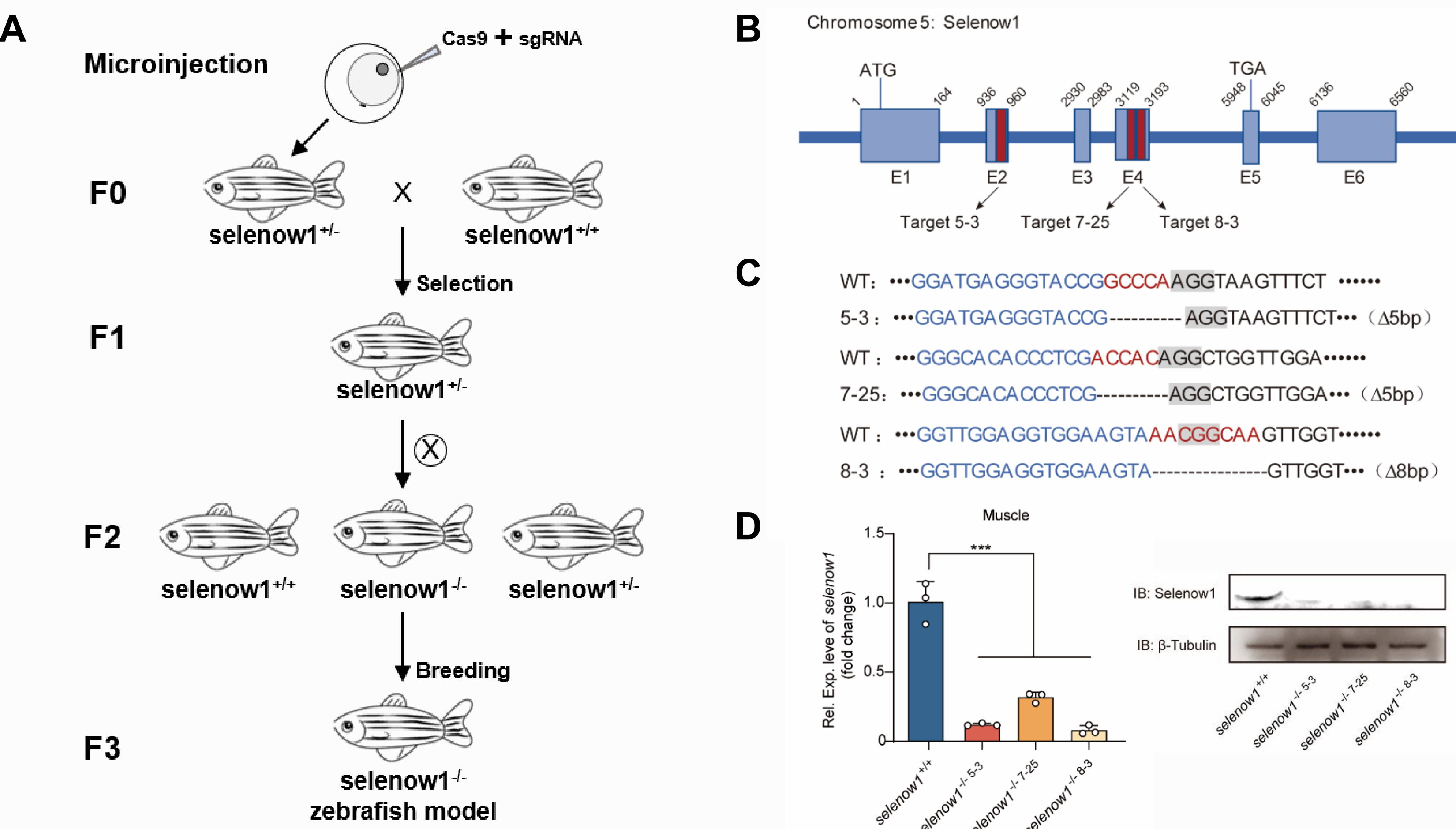


Fig. 1 A. Schematic diagram of *selenow1*^{-/-} zebrafish model construction. B. Genomic structure of zebrafish *selenow1* and genotypes of the mutation. C. Sequencing results of the targeted region from the WT and three kinds of homozygous zebrafish. D. The mRNA and protein level of *selenow1* in the muscle of *selenow1*^{-/-} zebrafish.

③ KO Selenow1 attenuates zebrafish growth

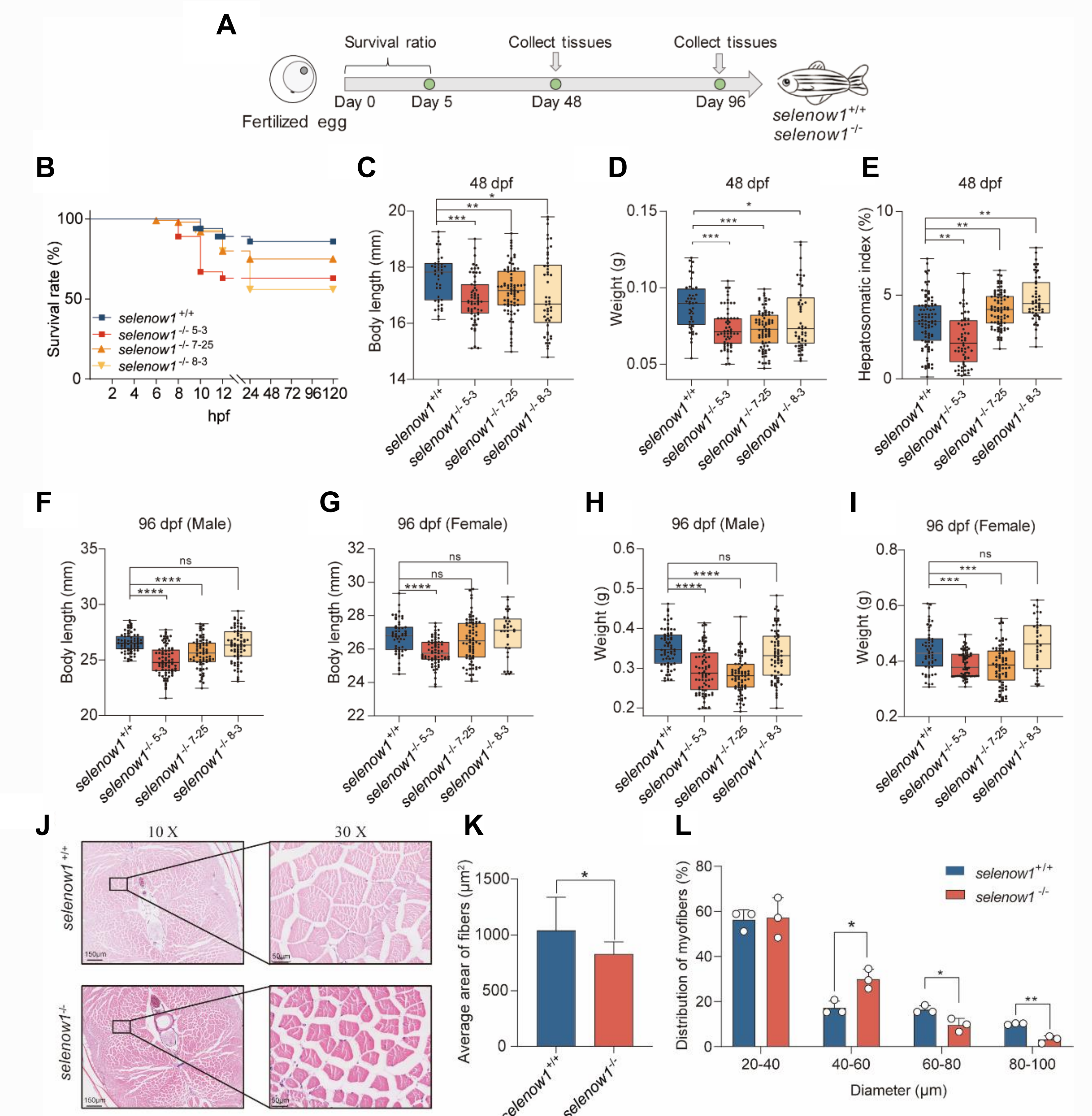


Fig. 2 A. Schematic diagram of zebrafish growth and development experiment. B. Survival curve of zebrafish embryos. C to I. Growth performance and somatic parameter of zebrafish at 48d (C to E) and 96d (F to I). J to L. Effect of knockout *selenow1* on zebrafish skeletal muscle.

④ Selenow1 mediates the PI3K/Akt/FoxO pathway

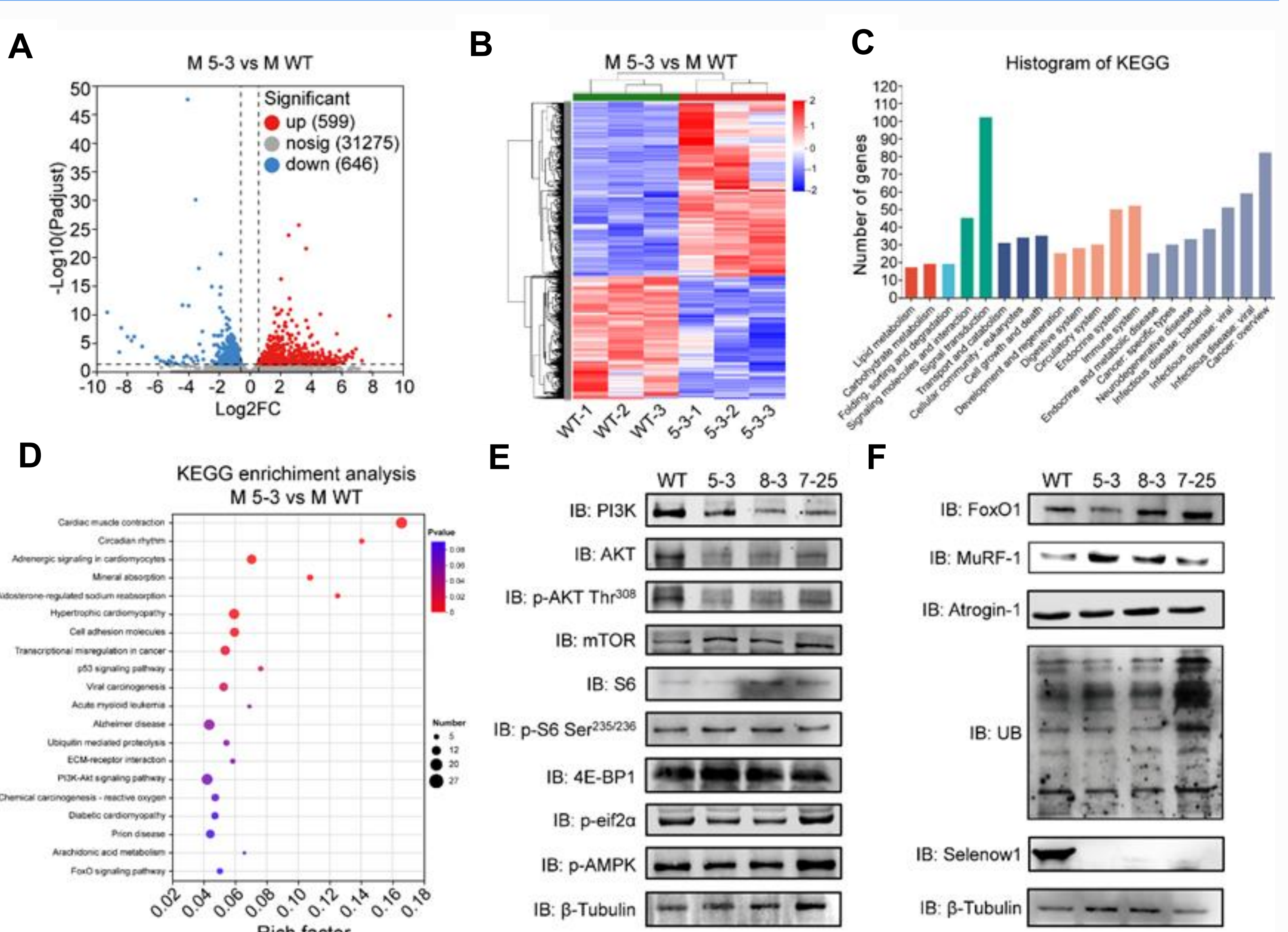


Fig. 3 Volcano map (A), Heat map (B), Kyoto Encyclopedia of Genes and Genomes (KEGG) pathway (C, D) categories of the differentially expressed genes (DEGs) in WT and *selenow1*^{-/-} 5-3 muscle. E and F. The expression of key factors of PI3K/Akt/FoxO pathway in *selenow1*^{-/-} muscle.

⑤ Selenow1 stabilizes the AKT protein

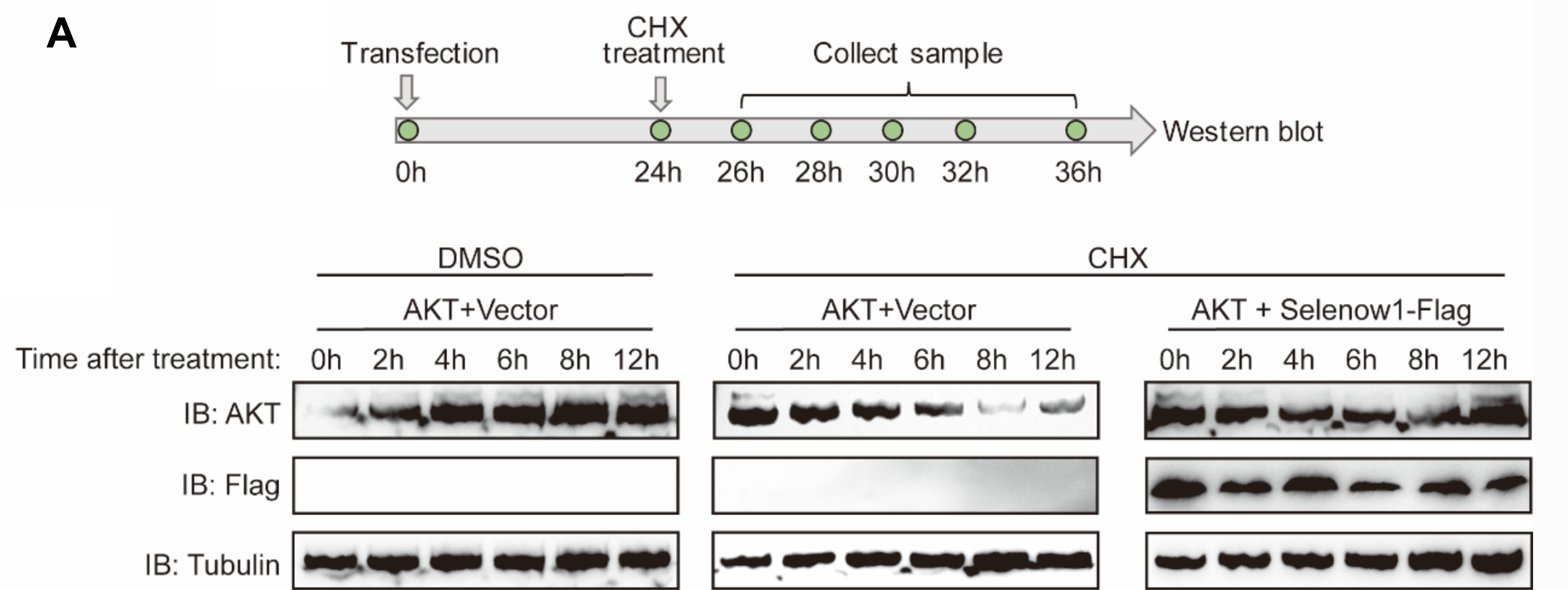
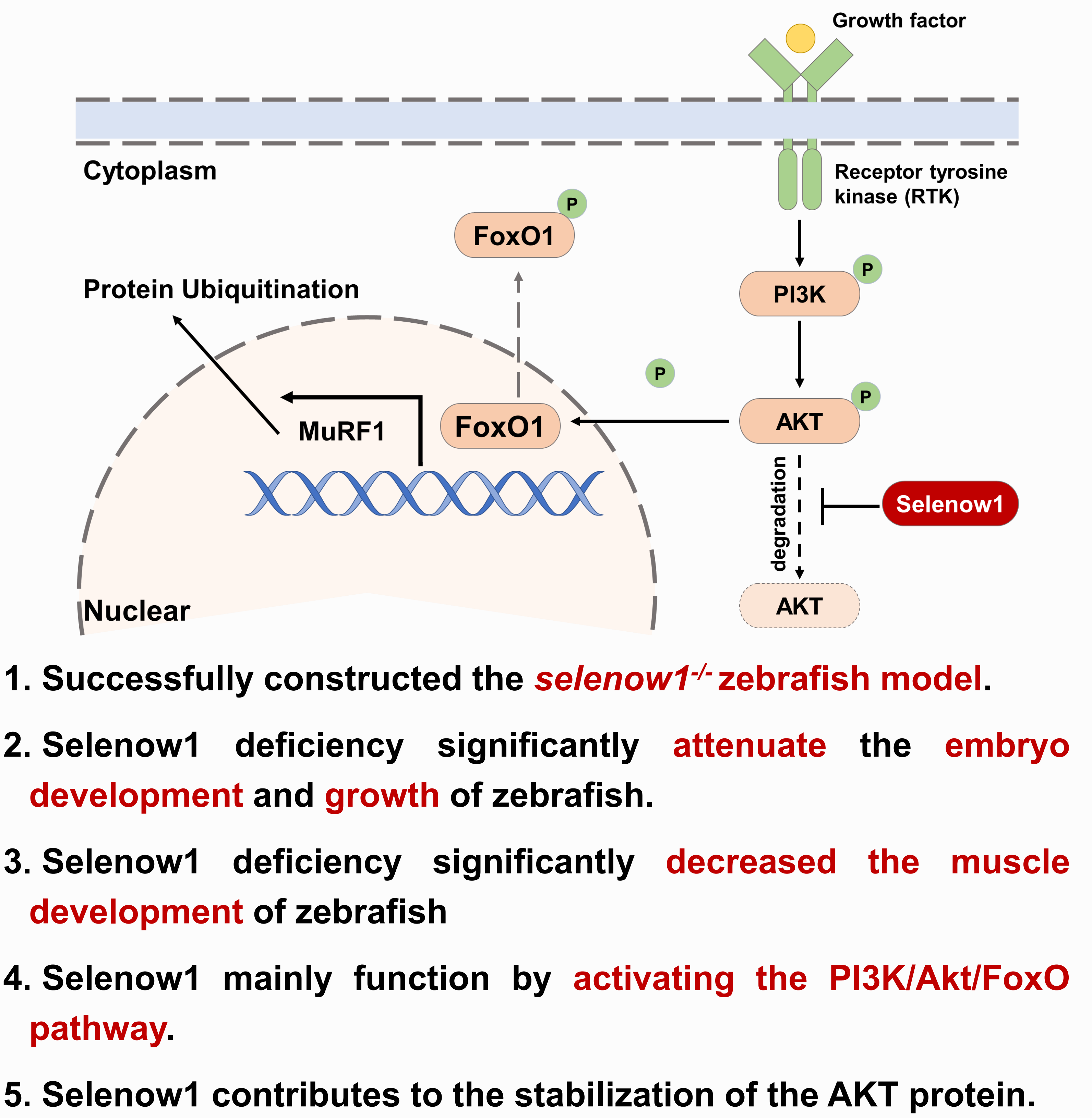


Fig. 4 The effect of Selenow1 in the stability of AKT in 293T cells.

⑥ Conclusion



1. Successfully constructed the *selenow1*^{-/-} zebrafish model.
2. Selenow1 deficiency significantly attenuate the embryo development and growth of zebrafish.
3. Selenow1 deficiency significantly decreased the muscle development of zebrafish
4. Selenow1 mainly function by activating the PI3K/Akt/FoxO pathway.
5. Selenow1 contributes to the stabilization of the AKT protein.