Instruction: *Please copy and paste the abstract below, using the format shown in the example provided. Please underline the name of presenting author, and put \* next to corresponding author. Please do not exceed character limit since additional characters will not be printed. Title is limited to 200 characters and the body of the abstract is limited to 400 words (excluding space).* ***Replace the example provided below:***

**Breakthroughs in Studying Membrane and Nuclear Steroid Receptors and Advancements in Gene Editing, NGS, Omics and Their Applications in Sustainable Aquaculture**

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Evidence has been accumulating for critical roles of membrane and nuclear steroid receptors and their downstream signaling targets in various physiological processes including growth, development, gonadal maturation, and sex changes in teleost species. We have been studying these steroid receptors and their targets in various physiological processes and key regulators in controlling these important processes using latest gene editing tools, NGS, and Omics. We determined signaling pathways and key regulators of these steroid receptors and their downstream targets in a teleost model, zebrafish and in several economical important species including carps, rice fish, tilapia and tuna. We also determined functions and molecular mechanisms of these receptors and downstream key regulators, especially their roles in the genomic and nongenomic signaling of steroids in teleosts. We found infertility, reduced fertility, increased fertility, or mono-sexual population due to defects or overexpression of these steroid receptors or their downstream targets. Our results clearly suggest that steroid receptors and their downstream targets play important roles in fertility, development, growth, gonadal maturation, and sex changes in teleosts. We also have successfully applied latest knowledge for the improvement and sustainability of economical important aquaculture species. Acknowledgements: Supported by: NSFC to WL, WZ, and WL; NIH and NCBC grants to YZ.

Key Words: genomic steroid signaling, nongenomic steroid signaling, steroid receptor, membrane steroid receptor, nuclear steroid receptor, gene editing, NGS, omics, sustainable aquaculture

**用基因編輯，NGS，組學研究膜和核類固醇受體的發現以及其在可持續水產養殖中的應用**

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越來越多的證據表明膜和核類固醇受體及其下游信號靶標在各種生理過程，包括生長，發育，性腺成熟和魚的性轉別變中確實起關鍵作用。我們使用了基因編輯，NGS和組學研究這些類固醇受體及其在各種生理過程中的下游的靶點，解明瞭控制這些重要過程的關鍵調控因數。我們也研究幾種經濟魚類包括鯉魚，稻米，羅非魚和金槍魚，並解明瞭這些類固醇受體，下游靶標，信號通路和關鍵調節因數。我們還解明這些受體的下游關鍵調控子的功能和分子機制，特別是它們在魚類中的類固醇的基因組和非基因組信號中的作用。當這些類固醇受體或其下游靶標敲除或過表達，我們發現有不育，生育力降低，生育力增加或單性魚。我們的研究結果清楚地表明，類固醇受體及其下游靶標在魚的生育，發育，生長，性腺成熟和性別變化中有重要作用。我們也成功地應用新的知識來改善經濟重要的水產品種，為可持續的水產做出了了貢獻。

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關鍵字：基因組類固醇信號，非基因組類固醇信號，膜類固醇受體，核類固醇受體，基因編輯，NGS，組學，可持續水產養殖