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**

**WeiQun Lu\*1,2, WeiMin Zhang3, WenSheng Li4, 5, Yong Zhu\*6， 7**

1. Key Laboratory of Exploration and Utilization of Aquatic Genetic Resources Ministry of Education, Shanghai Ocean University, Shanghai 201306, China.

2. International Research Center for Marine Biosciences at Shanghai Ocean University, Ministry of Science and Technology, Shanghai 201306, China, wqlv@shou.edu.cn

3. Institute of Aquatic Economic Animals, School of Life Sciences, Sun Yat-Sen University, Guangzhou, Biology Department, School of Life Sciences, Sun Yat-Sen University, Guangzhou 510006, China.

4. State Key Laboratory of Biocontrol, Institute of Aquatic Economic Animals and Guangdong Province Key Laboratory for Aquatic Economic Animals, South China Sea Bio-Resource Exploitation and Collaborative Innovation Center, Research Institute of Sun Yat-Sen University in Shen Zhen, School of Life Sciences, Sun Yat-Sen University, Guangzhou 510006, China.

5. State Key Laboratory of Biocontrol, Institute of Aquatic Economic Animals and Guangdong Province Key Laboratory for Aquatic Economic Animals, South China Sea Bio-Resource Exploitation and Collaborative Innovation Center, Research Institute of Sun Yat-Sen University in Shen Zhen, School of Life Sciences, Sun Yat-Sen University, Guangzhou 510006, China.

6. State Key Laboratory of Marine Environmental Science, College of Ocean and Earth Sciences, Xiamen University, Xiang’an Campus, Xiamen, Fujian 361000, China.

7，Department of Biology, East Carolina University, Greenville, North Carolina, USA. zhuy@ecu.edu

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

**用基因编辑，NGS，组学研究膜和核类固醇受体的发现以及其在可持续水产养殖中的应用**

吕为群\*1，2， 张为民3，李文笙4，5， 朱勇\*6，7

1. 上海海洋大学水产与生命学院水产种质资源发掘与利用教育部重点实验室
2. 上海海洋大学水产与生命学院中国科技部海洋生物科学国际联合研究中心
3. 中山大学生命科学学院
4. 中山大学生命科学学院
5. 广东省重要经济鱼类健康养殖工程技术研究中心
6. 厦门大学近海国家重点实验室
7. 东卡罗来纳州立大学生物系

越来越多的证据表明膜和核类固醇受体及其下游信号靶标在各种生理过程，包括生长，发育，性腺成熟和鱼的性转别变中确实起关键作用。我们使用了基因编辑，NGS和组学研究这些类固醇受体及其在各种生理过程中的下游的靶点，解明了控制这些重要过程的关键调控因子。我们也研究几种经济鱼类包括鲤鱼，稻米，罗非鱼和金枪鱼，并解明了这些类固醇受体，下游靶标，信号通路和关键调节因子。我们还解明这些受体的下游关键调控子的功能和分子机制，特别是它们在鱼类中的类固醇的基因组和非基因组信号中的作用。当这些类固醇受体或其下游靶标敲除或过表达，我们发现有不育，生育力降低，生育力增加或单性鱼。我们的研究结果清楚地表明，类固醇受体及其下游靶标在鱼的生育，发育，生长，性腺成熟和性别变化中有重要作用。我们也成功地应用新的知识来改善经济重要的水产品种，为可持续的水产做出了了贡献。

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关键词：基因组类固醇信号，非基因组类固醇信号，膜类固醇受体，核类固醇受体，基因编辑，NGS，组学，可持续水产养殖