



## KEYNOTE ADDRESS

**FISH AND REPRODUCTIVE PHYSIOLOGY - A JOURNEY FROM BASIC AND TRANSLATIONAL SCIENCE TO A RECOGNIZED VERTEBRATE MODEL****Yonathan Zohar**Department of Marine Biotechnology, University of Maryland, Baltimore County,  
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In September 1977, Dr. Roland Billard hosted the inaugural International Symposium on Reproductive Physiology of Fish (ISRPF) in Paimpont, France. As a young graduate student entering the field, I was fascinated by its depth and breadth - a scientific spectrum spanning from very fundamental research to innovative translational work. Myself and many others were drawn to the field with the hope of taking scientific ideas from the bench to their end-use. Indeed, our field has always addressed real-world challenges that could be overcome through basic research and understanding of gametogenesis, the hormones that control it, their mechanisms of action and interactions with the environment, and their complex regulation from the whole animal to the gene level. Over the past 9 ISRPFs, we have witnessed the growth of our field, the publication of a wealth of basic information in fish reproductive physiology, and its translation into practical uses and technologies for aquaculture and fisheries. Collectively, our basic research enabled the industry to produce good quality gametes, fertilized eggs and viable juveniles on demand, develop science-based approaches to induce reproductive sterility, control the timing of puberty and determine gender and sex ratio. Intensive research, driven by the applied challenges, transformed fish into a primary model in the field of vertebrate and animal reproductive physiology. Novel discoveries in environmental control of the brain-pituitary-gonadal (BPG) axis in

fish, sex determination and differentiation, GnRH multiplicity and its functional significance, structure/function of fish gonadotropins, gonadal steroids and their unique receptors, cross-communications between the components of the BPG axis, endocrine disruptors, and many others have led to new paradigms in animal reproductive biology that have had direct impacts far beyond just fish, in the fields of animal agriculture, environmental health and biomedicine. As the life sciences entered into the era of genomics, and beyond, the field of fish reproductive physiology has taken full advantage of the relevant platforms to further its pioneering role in twenty-first century science. With zebrafish and medaka becoming recognized vertebrate models, fish reproductive physiologists were among the first to capitalize on the benefits of these species and associated technologies, such as mutagenesis, knockdown, gene-transfer and fluorescence-based imaging, to identify and study genes involved in reproduction and their regulation by environmental and endocrine factors. Since 1977, our field has seen rapid and very exciting scientific progress, its successful application, and the recognition of fish as an important vertebrate model in reproductive physiology. This presentation will provide a historical overview of some of the above concepts focusing on the GnRH-reproductive axis in several fish models.