

6th International Symposium on Fish Endocrinology is honored to recognize the Life-time Achievement of PROFESSOR ZVI YARON

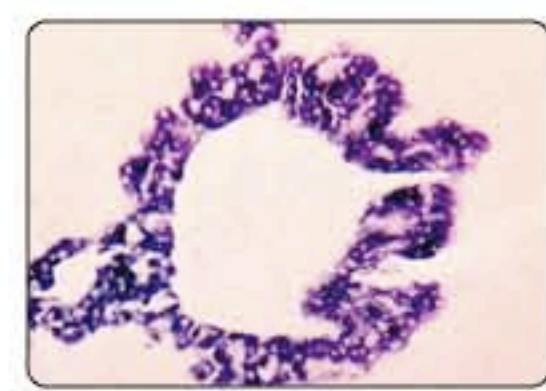


Major Area of Scientific Contribution

Prof. Yaron is among the founders of the discipline of fish reproductive physiology and significantly contributed to the development of experimental approaches which enabled the study of the gonad, pituitary brain axis

- Pioneered the use of enzymatic histochemistry for the identification of endocrine cells in the gonads and head-kidney (1966-1970)

3 β -hydroxysteroid dehydrogenase positive interrenal cells in the head kidney of *Morone saxatilis*



- Developed and introduced a validated radioimmunoassay (RIA) for determination of estradiol 17 β (E₂) in fish circulation (1977-1978)

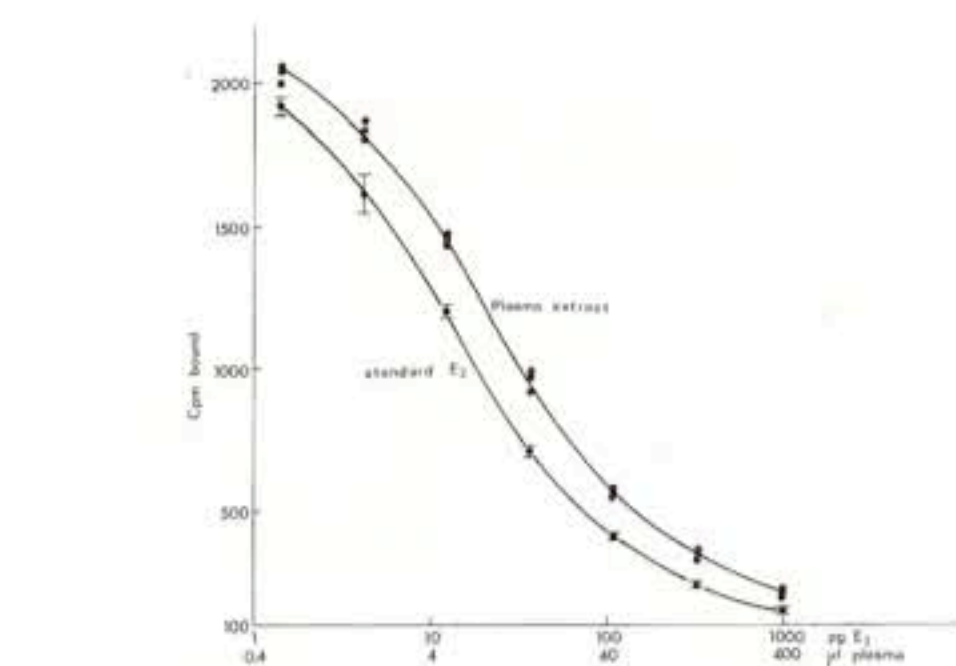
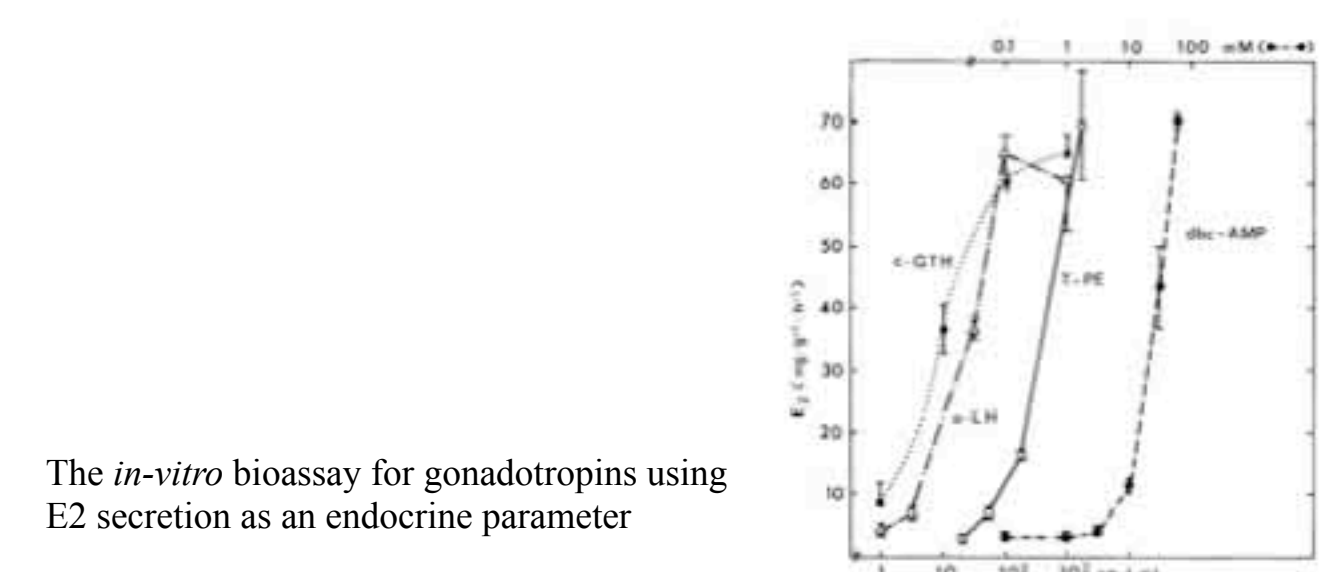


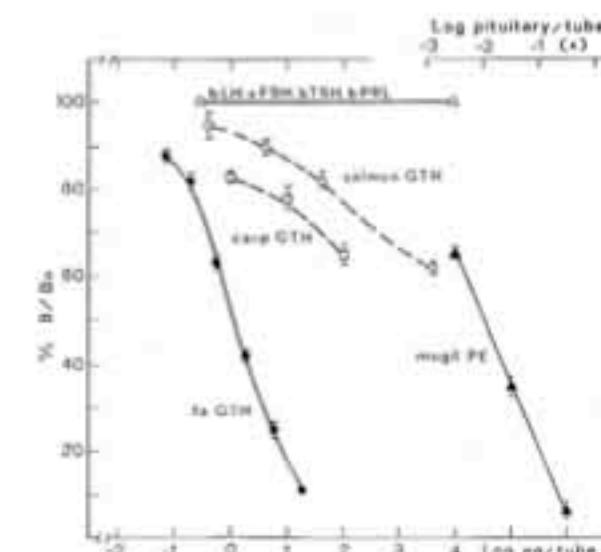
Fig. 1. Cross-reaction of *T. aurea* plasma extract with standard E₂ using the anti-E₂ serum. The points on the standard curve are means \pm SEM of replicates.

- The availability of the E₂ RIA enabled the development of a sensitive bioassay for gonadotropins, an assay which was not species specific yet hormone specific (1984)



The *in-vitro* bioassay for gonadotropins using E₂ secretion as an endocrine parameter

- The above *in-vitro* bioassay for gonadotropins was essential for isolating tilapia LH and development of an homologous LH RIA (1989)



Cross reaction of various mammalian pituitary hormones [bovine LH (bLH), ovine FSH (oFSH), bovine TSH (bTSH) and bovine prolactin (bPRL)], fish gonadotropins (salmon GTH and carp GTH) and mullet (*Mugil cephalus*) pituitary extract mugil (PE) in the radioimmunoassay for tilapia LH

- The RIA for LH was a prerequisite for studies on the transduction of GnRH signaling leading to LH release and the identification of possible

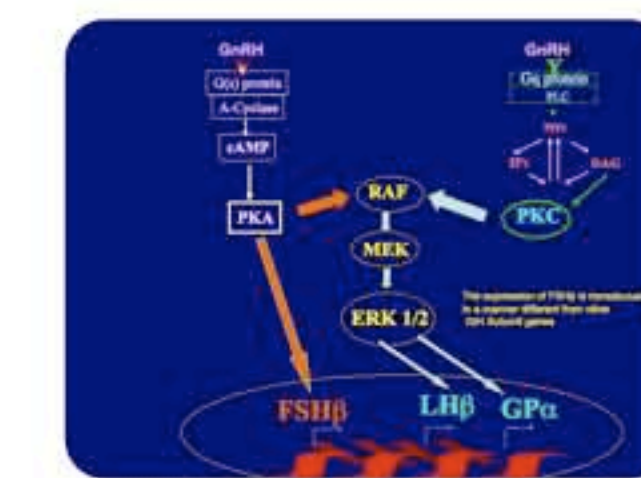
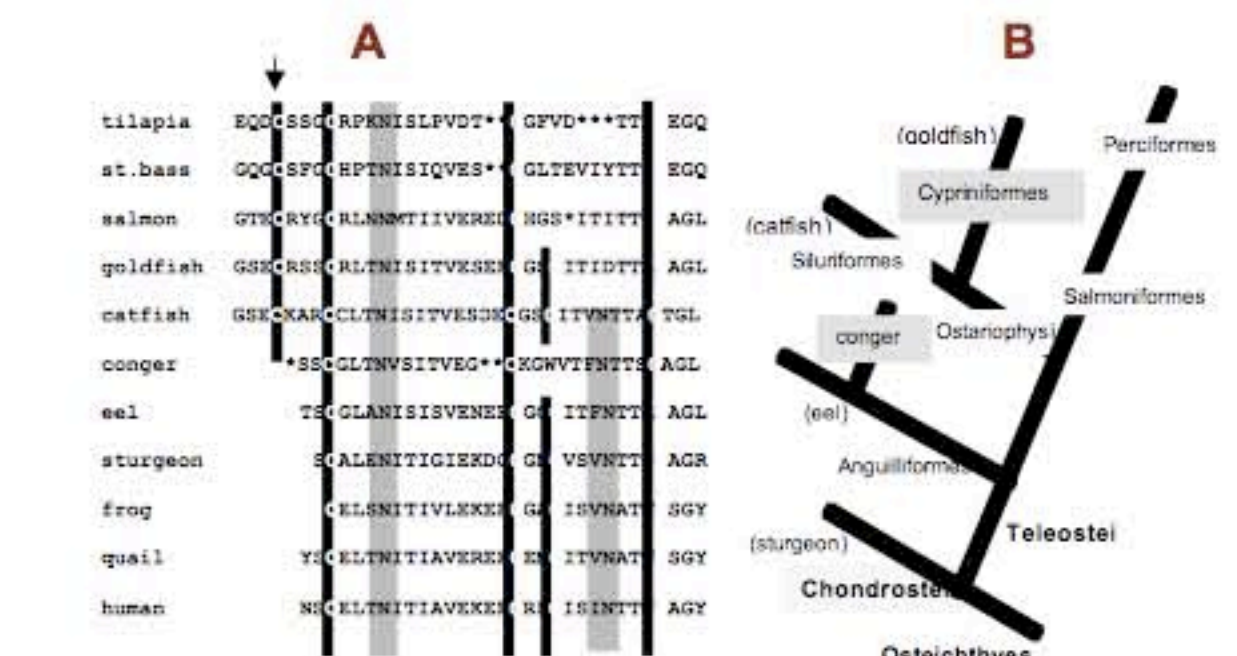
sites of dopamine inhibition along these pathways (1992- 1995)



Possible sites of dopamine inhibition in tilapia along the transduction pathways of GnRH signal

- The isolation and characterization of the genes encoding for GtH subunits enabled the study of hypothalamic regulation of their expression (1996-2006)

A Multiple sequence alignment of the FSH β N-terminal in bony fish (Osteichthyes). Sequences are aligned from the first amino acid of the mature peptide. Gaps (shown by asterisks) were introduced to maximize alignment. The Cys residues are marked with white letters on a black background, and putative glycosylation sites are marked with a gray background. Arrows indicate the Cys and N residues that were subjected to positive selection during the evolution of teleosts. B A proposed evolutionary model for the FSH β molecules in bony fish (Osteichthyes). Gray boxes represent branches exhibiting semiparallelism with the Salmoniformes/Perciformes branch.



The transduction of GnRH signal leading to the expression of FSH β gene in tilapia differs from that of a and LH β

Recognition by Peers & Service to the Scientific Community

- Chairman of the Aquaculture BARD committee
- Consulted to review manuscripts and grant proposals from national and international sources
- Elected to the Lederer Chair for Experimental Biology at Tel Aviv university
- 2007 Notable of the Israeli Society of Fish Breeders
- Supervised 35 graduate students and post docs (and

- mentored young scientists), who now occupy important positions in science.
- Major contribution towards interfacing between aquaculture and the scientific community
- Invited by universities abroad to help graduate students (Japan, UK, and South Africa).

- Invited by Prof. Hideshi Kobayashi to participate in graduate student teaching in Toho University



Professor Hideshi Kobayashi

Major Significant Publications

endocrine disrupters

Ilan, Z. and Yaron, Z. (1980). Suppression by organochlorines of the response to ACTH of the interrenal tissue in *Sarotherodon aureus* (Teleostei). J. Endocrin. 87,185-193

Ilan, Z. and Yaron, Z. (1983). Interference of organochlorines with cortisol secretion and metabolism in *Oreochromis aureus* (Steindachner). J. Fish. Biol. 22, 657-669

brain pituitary axis

Yaron, Z., Gur, G., Melamed, P., Rosenfeld, H., Elizur, A., Levavi-Sivan, B. (2003). Regulation of fish gonadotropins. Int. Rev. Cytology 225, 131-185

Melamed, P., Gur, G., Elizur, A., Rosenfeld, H., Rentier-Delrue, F. and Yaron, Z. (1996). Differential effects of gonadotropin releasing hormone, dopamine and somatostatin and their second messengers on the mRNA levels of gonadotropin IIB subunit and growth hormone in the teleost fish, tilapia. Neuroendocrinology 64, 320-328

Levavi-Sivan B. and Yaron, Z. (1993). Intracellular mediation of GnRH action on GtH release in tilapia. Fish Physiol. Biochem. 11, 51-59

Levavi-Sivan, B. Ofir, M. and Yaron, Z. (1995). Possible sites of dopaminergic inhibition of gonadotropin release from the pituitary of a teleost fish, tilapia. Mol. Cell. Endocrinol. 109, 87-95

Gur, G. Bonfil, D., Safarian, H., Naor, Z. and Yaron, Z. (2002). GnRH signaling pathways regulate differentially the tilapia gonadotropin subunit genes. Mol. Cell. Endocrinol. 189, 125-134.

Gur, G., Bonfil, D., Safarian, H., Naor, Z. and Yaron, Z. (2002). PACAP and NPY signaling pathways are involved in the regulation of gonadotropin subunit genes in tilapia. Neuroendocrinology 75, 164-174

Yaron, Z. (1995). Endocrine control of gametogenesis and spawning induction in the carp. Aquaculture, 129, 49-73

Yaron, Z. and Levavi-Zemansky, B. (1986). Fluctuations in GtH and ovarian steroids during the annual cycle and spawning of the common carp. Fish Physiol. Biochem. 2, 75-86

developing research tools

Bogomolnaya, A., Yaron, Z., et al. (1989). Isolation and radioimmunoassay of a steroidogenic gonadotropin of tilapia. Isr. J. Aquaculture 41, 123-136

Yaron, Z., Terkatin-Shimony et al. (1977). Occurrence and biological activity of estradiol-17 β in the intact and ovariectomized *Tilapia aurea* (Cichlidae, Teleostei). Gen. Comp. Endocrinol. 33, 45-52

Bogomolnaya, A. and Yaron, Z. (1984). Stimulation *in vitro* of estradiol secretion by the ovary of the cichlid fish, *Sarotherodon aureus*. Gen. Comp. Endocrinol. 53, 187-196

promoting teaching fish reproduction

Yaron, Z. and Sivan, B. (2006). Reproduction. In "The Physiology of Fishes" (Evans, D.H. and Claibourne, J.B., Eds.), CRC Press, Taylor & Francis, Boca Raton, pp. 343-386.



Professor Yaron was nominated with love and respect by Abigail Elizur, Berta Levavi-Sivan, Makito Kobayashi, Hanna Rosenfeld and Yoni Zohar. We have all been privileged to benefit from your insight and guidance.