



## 7th International Symposium on Fish Endocrinology is honored to recognize the Lifetime Achievement of

### Jean May Pierce JOSS (nee Eddy)

#### Major Areas of Scientific Contribution

For most of Jean Joss's career, her research interests have been broadly centered around the evolution of vertebrate hormone systems. She worked on a wide variety of vertebrate groups ranging from lampreys, through dogfish, sturgeon, lungfish, frogs, lizards and crocodiles to marsupials. Her specific areas of interest and expertise have been hormonal control of rhythms, reproduction, metamorphosis, osmoregulation, sex determination and more recently molecular and developmental evolution.

Many of the hormones in these various organisms were characterised thoroughly several very successful collaborations which enabled both the study of their physiology and the comparison of this molecular data with that of other vertebrates, eg. steroid hormones and peptide hormones of hypothalamic, pituitary, kidney and pancreatic origin. Jean was the author on 118 peer-reviewed publications and she gave 33 international presentations over a career that went from 1971 to 2011.

Reproductive endocrinology was another focus area, and to this end, she established a successful breeding population of lungfish in captivity at Macquarie University. This facility for lungfish research was the only one in the world. It has made lungfish more accessible for research and provided embryonic and larval stages to enable the study of ontogeny of endocrine glands and other structures and organs, such as the neural crest, patterning genes in paired appendage, development and role of thyroid in development.

Perhaps Jean's most creative work was on topics related to the fish-tetrapod transition. Working with several collaborators Jean conclusively showed that lungfish, (using the Australian lungfish as her model system), are the closest living vertebrate to the ancestors of the land vertebrates. As such, they hold the key to discovering the pre-adaptations to life on land and the ancestry of mammalian (incl. human) physiological, morphological and developmental systems and by so doing the actual mechanisms behind this remarkable transition are being discovered. Much of this work is presented in a book that she co-edited entitled, "Lungfish Biology" – published by Science publishers in 2010.

Finally, Jean led a world-wide appeal to preserve the Mary River in Queensland, Australia as a protected habitat for the Australian Lungfish.

#### Recognition by Peers and Service to the Scientific Community

1993- Elected Fellow of the Zoological Society of Calcutta.  
 1996- Elected Fellow of the Royal Zoological Society of NSW.  
 2001- Personal Chair (Endowed), Macquarie University  
 2009-2011 – Appointed Honorary Professor in School of Zoology, University of Queensland

1996- 2004 Editorial Board, *General and Comparative Endocrinology*  
 2004 - 2011 Associate Editor, *General and Comparative Endocrinology*  
 1998-present Editorial Board, *Molecular and Developmental Evolution (JEZ)*

Ph.D. Thesis advisor: Stuart Rowland, Shelley Burgin, Craig Smith, Jeffrey Downing, Ashni Raj Prasad, Sylvia Rajasekar, Michael Watt, Peter Harlow, Margareta Suitja, Chris Longson, Mohammad Mohammad  
 M.S. Thesis advisor: Bronwyn McAllan, Stuart Smith, Masoud Hassanpour



#### Major Significant Publications

- Kundrát M., Joss, JMP, Smith, MM. 2008. Fate mapping in embryos of *Neoceratodus forsteri* reveals cranial neural crest participation in tooth development is conserved from lungfish to tetrapods. *Evolution and Development* 10: 531-536.
- Shu, Y. Murata, S. Takahashi, M. Asashima, J. M. P. Joss, M. Tanaka, and M. Okabe. 2007. Molecular evidence that the lungs and the swimbladder are homologous organs. *Journal of Morphology*, 268(12):1134-1134.
- Brinkmann, H, Denl, A, Zitzier, J, Joss, J, Meyer, A. 2004. Complete mitochondrial genome sequences of the South-American and the Australian lungfishes: Testing of the phylogenetic performance of mitochondrial data sets for phylogenetic problems in tetrapod relationships. *J mol Evol* 59, 834-848
- Joss, J.M.P. 1998. Are extant lungfish neotenic? *Clin. Exp. Pharmacol. Physiol.* 25, 733-735.