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Melatonin as a potent regulator of ovarian functions in carp *Catla catla*

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The pineal hormone melatonin (N-acetyl-5-methoxytryptamine) is implicated in the regulation of reproduction in different vertebrates. However, until recent years the topic remained speculative for any low-latitude fish including the carp *Catla catla* which because of its surface dwelling habit offers as an ideal model for the study on the role of pineal and its hormone melatonin in the regulation of reproduction under natural as well as altered photoperiodic conditions. We demonstrated for the first time that the temporal pattern of circulating melatonin and the influences of both photoperiods and exogenous melatonin on gonads vary in relation to the reproductive status of the concerned fish. We also provided first evidence of the occurrence and dynamics of melatonin receptors on the ovary and elaborated the extra-hypothalamic action of melatonin in the regulation of ovarian functions in any fish. Further *in vitro* molecular biological study revealed that melatonin accelerates the action of maturation inducing hormone on meiotic cell cycle resumption in carp oocytes by formation of a complex of two proteins, cyclin B and cyclin dependant kinase Cdk1. Very recently, we described intra-cellular cascade mechanisms of processing of light information in the pineal emphasizing the role of light and different neuronal signals in time-dependent expression of photoreceptor proteins and regulation of melatonin generating system in carp pineal. Collectively, and most importantly, the data accumulated so far have contributed to the understanding on the role of melatonin in the regulation of fish reproduction in general, and in the breeding management of carp in particular.

Biography

Saumen Kumar Maitra, since his award of Ph.D. degree from Calcutta University in India and postdoctoral studies in University of Mainz, Germany, for past 30 years is contributing significantly to the knowledge on the functions of pineal and its hormone melatonin in different vertebrates. He is the President of the Society for Reproductive Biology and Comparative Endocrinology, a premier academic body in India and former Secretary of the Asia-Oceania Society for Comparative Endocrinology. He served as the Head of the Department of Zoology in different Universities in India, edited 5 international books and published more than 130 papers in reputed journals.

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