Chapter 12
Dopamine Inhibition of Eel Reproduction

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12.1 Introduction

The silvering process includes various physiological and morphological changes that prepare the future genitors (silver eels) for the oceanic reproductive migration (e.g. Lokman et al. 1998). Silvering also marks the beginning of puberty (Aroua et al. 2005, and Chapter 11). However, silver eels are still sexually immature when they leave the continental habitats, and they remain blocked at this prepubertal stage if prevented from their reproductive migration. Because no maturing or spawning eels have ever been observed in the wild, the silver prepubertal stage is the last known stage of the eel biological cycle (for review, see Dufour et al. 2003). Accordingly, the regulatory mechanisms of puberty, sexual development, migration, and finally spawning are still not well understood.

Puberty can be defined as the transformation from a sexually immature juvenile into a mature adult by providing the brain-pituitary-gonad (BPG) axis with its full hormonal and gametogenetic capacity (Norris 1997; Schulz et al. 2000). Puberty is marked by the onset of gametogenesis, and the age of puberty and sexual maturation is determined by genetic factors as well as controlled by the nutritional status and/or body growth rate. Both in teleosts and mammals it seems that activation of the brain neuroendocrine system(s) is the key event to initiate puberty. What leads to this activation is, however, not understood.

The BPG axis consists of three physiologically connected constituents: brain, pituitary and gonads (Fig. 12.1). Stimulatory and inhibitory inputs merge in the

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