

# Chapter 11

## The Gonadoliberin(S)-Gonadotropin(S) Axis in the Eel: Expression and Regulation Under Induced Maturation and Sex Steroid Feedbacks

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**Abbreviations** 11-KT: 11-ketotestosterone; AR: androgen receptor; CPE: carp pituitary extract; DHT: dihydrotestosterone; E2: estradiol; ER: estrogen receptor; ERE: estrogen responsive element; FSH: follicle-stimulating hormone; FSH $\beta$ :  $\beta$  subunit of FSH; FSH-R: FSH receptor; GAP: GnRH-Associated Peptide; GnRH: gonadotropin-releasing hormone; cGnRH-II: chicken-II form of GnRH; cfGnRH: catfish form of GnRH; dfGnRH: dogfish form of GnRH; hrGnRH: herring form of GnRH; mGnRH: mammalian form of GnRH; mdGnRH: medaka form of GnRH; pjGnRH: pejerrey form of GnRH; sGnRH: salmon form of GnRH; sbGnRH: sea bream form of GnRH; wfGnRH: whitefish form of GnRH; GnRH-R: GnRH receptor; GP $\alpha$ : common subunit of gonadotropins; GTH: gonadotropins; hCG: human chorionic gonadotropin; HPLC: high performance liquid chromatography; LH: luteinizing hormone; LH $\beta$ :  $\beta$  subunit of LH; LH-R: LH receptor; RIA: radioimmunoassay; RT-PCR: reverse-transcription polymerase chain reaction; T: testosterone

### 11.1 Introduction

At the start of the reproductive migration towards the Sargasso Sea, silver eels are still immature and remain blocked at this prepubertal stage as long as migration is prevented. To date, adult mature eels have never been caught and only experimental treatments of silver eels with gonadotropic hormones have led to the observation of sexually mature animals (Fontaine 1936; Fontaine et al. 1964). The lack of sexual maturation at the silver stage is due to a deficient production of pituitary gonadotropins (GtHs) (Dufour et al. 1983a, b). Stimulation of synthesis and release of pituitary

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