

Gonadotrophin-releasing hormone receptors in GtoPdb v.2025.3

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Abstract

GnRH₁ and GnRH₂ receptors (**provisional nomenclature [39]**, also called Type I and Type II GnRH receptor, respectively [85]) have been cloned from numerous species, most of which express two or three types of GnRH receptor [85, 84, 116]. **GnRH I** (p-Glu-His-Trp-Ser-Tyr-Gly-Leu-Arg-Pro-Gly-NH₂) is a hypothalamic decapeptide also known as luteinizing hormone-releasing hormone, gonadoliberin, luliberin, gonadorelin or simply as GnRH. It is a member of a family of similar peptides found in many species [85, 84, 116] including **GnRH II** (pGlu-His-Trp-Ser-His-Gly-Trp-Tyr-Pro-Gly-NH₂ (which is also known as chicken GnRH-II). Receptors for three forms of GnRH exist in some species but only GnRH I and GnRH II and their cognate receptors have been found in mammals [85, 84, 116]. GnRH₁ receptors are expressed by pituitary gonadotrophs, where they mediate the effects of GnRH on gonadotropin hormone synthesis and secretion that underpin central control of mammalian reproduction. GnRH analogues are used in assisted reproduction and to treat steroid hormone-dependent conditions [58]. Notably, agonists cause desensitization of GnRH-stimulated gonadotropin secretion and the consequent reduction in circulating sex steroids is exploited to treat hormone-dependent cancers of the breast, ovary and prostate [58]. GnRH₁ receptors are selectively activated by GnRH I and all lack the COOH-terminal tails found in other GPCRs. GnRH₂ receptors do have COOH-terminal tails and (where tested) are selective for GnRH II over GnRH I. GnRH₂ receptors are expressed by some primates but not by humans [88]. Phylogenetic classifications divide GnRH receptors into three [85] or five groups [132] and highlight examples of gene loss through evolution, with humans retaining only one ancient gene. The structure of the GnRH₁ receptor in complex with **elagolix** has been elucidated [135]. Cryo-EM structures of GnRH bound to both pig and frog GnRHRs have also been reported [115].

Contents

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Receptors

GnRH₁ receptor

<https://www.guidetopharmacology.org/GRAC/ObjectDisplayForward?objectId=256>

GnRH₂ receptor

<https://www.guidetopharmacology.org/GRAC/ObjectDisplayForward?objectId=257>

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