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# Type II RTKs: Insulin receptor family in GtoPdb v.2025.3

Chloe J. Peach[1]

1. University of Nottingham, UK

## Abstract

The circulating peptide hormones insulin and the related insulin-like growth factors (IGF) activate Class II receptor tyrosine kinases [13], to evoke cellular responses, mediated through multiple intracellular adaptor proteins. Unlike other receptor tyrosine kinases, the functional receptor in the insulin receptor family is derived from a single gene product, cleaved post-translationally into two peptides, which then cross-link via disulphide bridges to form a heterotetramer. Intriguingly, the endogenous peptide ligands are formed in a parallel fashion with post-translational processing producing a heterodimer linked by disulphide bridges. Signalling through the receptors is mediated through a rapid autophosphorylation event at intracellular tyrosine residues, followed by recruitment of multiple adaptor proteins, notably *IRS1* (P35568), *IRS2* (Q9Y4H2), *SHC1* (P29353), *GRB2* (P62993) and *SOS1* (Q07889).

Serum levels of free IGFs are kept low by the action of IGF binding proteins (IGFBP1-5, P08833, P18065, P17936, P22692, P24593), which sequester the IGFs; overexpression of IGFBPs may induce apoptosis, while IGFBP levels are also altered in some cancers.

## Contents

This is a citation summary for Type II RTKs: Insulin receptor family in the Guide to Pharmacology database (GtoPdb). It exists purely as an adjunct to the database to facilitate the recognition of citations to and from the database by citation analyzers. Readers will almost certainly want to visit the relevant sections of the database which are given here under database links.

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Please note that the database version for the citations given in GtoPdb are to the most recent preceding version in which the family or its subfamilies and targets were substantially changed. The links below are to the current version. If you need to consult the cited version, rather than the most recent version, please contact the GtoPdb curators.

## Database links

Type II RTKs: Insulin receptor family
https://www.guidetopharmacology.org/GRAC/FamilyDisplayForward?familyId=321

Receptors

- InsR(Insulin receptor)
  https://www.guidetopharmacology.org/GRAC/ObjectDisplayForward?objectId=1800
- IGF1R(Insulin-like growth factor I receptor)
  https://www.guidetopharmacology.org/GRAC/ObjectDisplayForward?objectId=1801
- IRR(Insulin receptor-related receptor)
  https://www.guidetopharmacology.org/GRAC/ObjectDisplayForward?objectId=1802

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