IUPHAR/BPS Guide to Pharmacology CITE
https://doi.org/10.2218/gtopdb/F793/2025.3

Type IX RTKs: MuSK in GtoPdb v.2025.3

Chloe J. Peach[1]

1. University of Nottingham, UK

Abstract

The muscle-specific kinase MuSK is associated with the formation and organisation of the neuromuscular junction from the skeletal muscle side. agrin forms a complex with low-density lipoprotein receptor-related protein 4 to activate MuSK [5]. MuSK-mediated phosphorylation of downstream targets is involved in stabilised neuromuscular function. It is the target of pathogenic autoantibodies in myasthenia gravis, an autoimmune neuromuscular disease.

Contents

This is a citation summary for Type IX RTKs: MuSK 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.

GtoPdb is an expert-driven guide to pharmacological targets and the substances that act on them. GtoPdb is a reference work which is most usefully represented as an on-line database. As in any publication this work should be appropriately cited, and the papers it cites should also be recognized. This document provides a citation for the relevant parts of the database, and also provides a reference list for the research cited by those parts. For further details see [2].

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 IX RTKs: MuSK
https://www.guidetopharmacology.org/GRAC/FamilyDisplayForward?familyId=793
Receptors
MuSK(muscle associated receptor tyrosine kinase)
https://www.guidetopharmacology.org/GRAC/ObjectDisplayForward?objectId=1847

References

1. Anastassiadis T, Deacon SW, Devarajan K, Ma H and Peterson JR. (2011) Comprehensive assay of kinase catalytic activity reveals features of kinase inhibitor selectivity. *Nat Biotechnol* **29**: 1039-45 [PMID:22037377]
2. Buneman P, Christie G, Davies JA, Dimitrellou R, Harding SD, Pawson AJ, Sharman JL and Wu Y. (2020) Why data citation isn't working, and what to do about it *Database* **2020** [PMID:32367113]
3. Davis MI, Hunt JP, Herrgard S, Ciceri P, Wodicka LM, Pallares G, Hocker M, Treiber DK and Zarrinkar PP. (2011) Comprehensive analysis of kinase inhibitor selectivity. *Nat Biotechnol* **29**: 1046-51 [PMID:22037378]
4. Gao Y, Davies SP, Augustin M, Woodward A, Patel UA, Kovelman R and Harvey KJ. (2013) A broad activity screen in support of a chemogenomic map for kinase signalling research and drug discovery. *Biochem J* **451**: 313-28 [PMID:23398362]
5. Kim N, Stiegler AL, Cameron TO, Hallock PT, Gomez AM, Huang JH, Hubbard SR, Dustin ML and Burden SJ. (2008) Lrp4 is a receptor for Agrin and forms a complex with MuSK. *Cell* **135**:

334-42 [PMID:18848351]
6. Tao ZF, Chen Z, Bui MH, Kovar P, Johnson E, Bouska J, Zhang H, Rosenberg S, Sowin T and Lin NH. (2007) Macrocyclic ureas as potent and selective Chk1 inhibitors: an improved synthesis, kinome profiling, structure-activity relationships, and preliminary pharmacokinetics. *Bioorg Med Chem Lett* **17**: 6593-601 [PMID:17935989]
7. Till JH, Becerra M, Watty A, Lu Y, Ma Y, Neubert TA, Burden SJ and Hubbard SR. (2002) Crystal structure of the MuSK tyrosine kinase: insights into receptor autoregulation. *Structure* **10**: 1187-96 [PMID:12220490]
8. Wang T, Ioannidis S, Almeida L, Block MH, Davies AM, Lamb ML, Scott DA, Su M, Zhang HJ and Alimzhanov M *et al*.. (2011) In vitro and in vivo evaluation of 6-aminopyrazolyl-pyridine-3-carbonitriles as JAK2 kinase inhibitors. *Bioorg Med Chem Lett* **21**: 2958-61 [PMID:21493067]
9. Wodicka LM, Ciceri P, Davis MI, Hunt JP, Floyd M, Salerno S, Hua XH, Ford JM, Armstrong RC and Zarrinkar PP *et al*.. (2010) Activation state-dependent binding of small molecule kinase inhibitors: structural insights from biochemistry. *Chem Biol* **17**: 1241-9 [PMID:21095574]