

Voltage-gated sodium channels (Na_v) in GtoPdb v.2023.1

William A. Catterall¹, Alan L. Goldin² and Stephen G. Waxman³

1. University of Washington, USA
2. University of California, USA
3. Yale University, USA

Abstract

Sodium channels are voltage-gated sodium-selective ion channels present in the membrane of most excitable cells. Sodium channels comprise of one pore-forming α subunit, which may be associated with either one or two β subunits [179]. α -Subunits consist of four homologous domains (I-IV), each containing six transmembrane segments (S1-S6) and a pore-forming loop. The positively charged fourth transmembrane segment (S4) acts as a voltage sensor and is involved in channel gating. The crystal structure of the bacterial NavAb channel has revealed a number of novel structural features compared to earlier potassium channel structures including a short selectivity filter with ion selectivity determined by interactions with glutamate side chains [278]. Interestingly, the pore region is penetrated by fatty acyl chains that extend into the central cavity which may allow the entry of small, hydrophobic pore-blocking drugs [278]. Auxiliary β 1, β 2, β 3 and β 4 subunits consist of a large extracellular N-terminal domain, a single transmembrane segment and a shorter cytoplasmic domain.

The nomenclature for sodium channels was proposed by Goldin *et al.*, (2000) [146] and approved by the NC-IUPHAR Subcommittee on sodium channels (Catterall *et al.*, 2005, [53]).

Contents

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Database links

[Voltage-gated sodium channels \(Na_v\)](#)

<https://www.guidetopharmacology.org/GRAC/FamilyDisplayForward?familyId=82>

Introduction to Voltage-gated sodium channels (Na_v)

<https://www.guidetopharmacology.org/GRAC/FamilyIntroductionForward?familyId=82>

Channels and Subunits

Na_v1.1

<https://www.guidetopharmacology.org/GRAC/ObjectDisplayForward?objectId=578>

Na_v1.2

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Na_v1.9

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