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**Title:**

Gating Properties of Purinergic P2X Receptor Channels

**Abstract:**

Mammalian adenosine-5'-triphosphate (ATP)-gated non-selective cation channels (P2XRs) can be composed of seven possible subunits, denoted P2X1 to P2X7. Each subunit contains a large ectodomain, two transmembrane domains and intracellular N- and C-termini. Functional P2XRs are organized as homomeric and heteromeric trimers. The ectodomains contain three ATP binding sites, presumably located between neighboring subunits and formed by highly conserved residues. The gating of P2XRs usually consists of three phases: a rapid rising phase of inward current induced by the application of agonist (activation phase), a slowly developing decay phase in the presence of an agonist (desensitization phase), and a relatively rapid decay of current after ATP is removed (deactivation phase). On the other hand, the profile of P2X7R current is more complex, as indicated by the secondary current growth during sustained agonist application. The slow secondary growth of current in the biphasic P2X7R response coincides temporally with pore dilation. The current knowledge on receptor-specific gating properties will be presented. A work in progress on the relationship between the pattern of gating and receptor function will also be discussed.