Solution Structure of α-Conotoxin OmI, a Neuromuscular toxin Specific for the α₄/β₂ Subunit Interface of Neuronal Nicotinic Acetylcholine Receptor

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α-Conotoxin OmI, a 17-residue polypeptide isolated from the venom of the cone snail Conus magus, is a potent toxin which specifically blocks the mammalian neuronal nicotinic acetylcholine receptors composed of α₄/β₂ subunits. The three-dimensional solution structure of α-conotoxin OmI has been determined by two-dimensional ¹H NMR spectroscopy. The α-Conotoxin OmI adopts a well-defined compact structure with a global fold common to a α 4/7-subfamily of α-conotoxins. The backbone folding is stabilized by two disulfide bonds which connect the N-terminus to both the middle and C-terminus of the structure. The unique binding preference of α-conotoxin OmI to the α₄/β₂ subunit interface of neuronal nicotinic acetylcholine receptor has been studied through structural comparison with various α-conotoxins possessing distinct receptor subtype specificities.

Funding for the above work has been supported by NSM0140132 from the Ministry of Science and Technology of Korea to K. H.