Conotoxins—short, disulfide-rich peptides found in the venom of cone snails—exhibit unprecedented receptor binding selectivity. α-Conotoxin MII (α-CTxMII) targets the $\alpha_3\beta_2$-nicotinic acetylcholine receptor (nAChR) isoform; studying the interaction of this peptide with nAChRs provides an understanding of binding determinants that may benefit therapeutic development for diseases like Alzheimer's and Parkinson's. Linear peptide was synthesized on solid support RINK resin by automated peptide synthesis followed by cleavage from resin and subsequent oxidative folding to form disulfide bridges. Mass spectral analysis validated proper synthesis and initial fold formation. QTOF-MS (m/z): $[M + H]^+$ calculated for α-CTxMII, 1856.8; found, 928.9, 619.6 which correspond to the doubly and triply charged molecular ions. Next the peptide will be purified by chromatography and again verified using mass spectrometry. Finished product will be used to validate the applicability of PC-12 cells for expression of $\alpha_3\beta_2$-nAChRs.