



Project Description:

**Objectives:** The objective of this project is to study muscarinic acetylcholine-receptor mediated regulation of adenylate cyclase activity, in an attempt to understand how neurotransmitter-receptor interactions modulate synaptic transmission.

**Major Findings:** The activity of adenylate cyclase in neuroblastoma x glioma hybrid NG108-15 cells is regulated by the interaction of acetylcholine and its analogues with the muscarinic acetylcholine receptors of the cells. Addition of the acetylcholine analogue carbamylcholine inhibits adenylate cyclase activity. However, growth of cells with carbachol results in a prolonged increase in adenylate cyclase activity. Adenylate cyclase activity increases slowly and after 18-24 hours is 1.5-3 times higher than control values. Intracellular cAMP is also 1.5-3-fold higher in carbachol-grown cells than in controls. These changes are maintained for at least three days in the presence of carbachol, but the activity returns to control values if carbachol is removed.

**Significance to Biomedical Research:** The results obtained suggest that neurotransmitter-receptor interactions can exert long-lived effects on macromolecules required for synaptic transmission.

**Proposed Course:** Work on this project will be incorporated into other projects in the coming year.