

SMITHSONIAN SCIENCE INFORMATION EXCHANGE PROJECT NUMBER (Do NOT use this space)	U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE PUBLIC HEALTH SERVICE NOTICE OF INTRAMURAL RESEARCH PROJECT	PROJECT NUMBER Z01 HL 00017-02 LBG								
PERIOD COVERED July 1, 1976 through September 30, 1977										
TITLE OF PROJECT (80 characters or less) Acetylcholine Receptors in the Developing Nervous System										
NAMES, LABORATORY AND INSTITUTE AFFILIATIONS, AND TITLES OF PRINCIPAL INVESTIGATORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED ON THE PROJECT <table border="0" data-bbox="207 457 1299 525"> <tr> <td>PI:</td> <td>Hiroyuki Sugiyama</td> <td>Visiting Associate</td> <td>LBG NHLBI</td> </tr> <tr> <td></td> <td>Marshall Nirenberg</td> <td>Chief, LBG</td> <td>LBG NHLBI</td> </tr> </table>			PI:	Hiroyuki Sugiyama	Visiting Associate	LBG NHLBI		Marshall Nirenberg	Chief, LBG	LBG NHLBI
PI:	Hiroyuki Sugiyama	Visiting Associate	LBG NHLBI							
	Marshall Nirenberg	Chief, LBG	LBG NHLBI							
COOPERATING UNITS (if any)										
LAB/BRANCH Laboratory of Biochemical Genetics										
SE Section on Molecular Biology										
INSTITUTE AND LOCATION NHLBI, NIH, Bethesda, Maryland 20014										
TOTAL MANYEARS: 1.6	PROFESSIONAL: 1.3	OTHER: 0.3								
CHECK APPROPRIATE BOX(ES) <input type="checkbox"/> (a) HUMAN SUBJECTS <input type="checkbox"/> (b) HUMAN TISSUES <input checked="" type="checkbox"/> (c) NEITHER <input type="checkbox"/> (a1) MINORS <input type="checkbox"/> (a2) INTERVIEWS										
SUMMARY OF WORK (200 words or less - underline keywords) <p>The goal of this project is to define the properties of <u>muscarinic and nicotinic acetylcholine receptors</u> and acetylcholinesterase during development of chick embryo retina. Thus far we have elucidated (1) the specificity and affinities of muscarinic and nicotinic acetylcholine receptors for receptor activation and antagonists, (2) the number of receptors were defined as a function of developmental age of the retina, and (3) the location of nicotinic and muscarinic receptors within the retina was determined.</p>										

Project Description:

Objectives: The objectives are to define the biochemical properties of acetylcholine receptors before and after synaptogenesis in the retina.

Major Findings: Neurons dissociated from chick embryo retina and maintained in vitro were found to reaggregate and form, in vitro, approximately 1×10^9 synapses per mg of protein. Three types of synapses and several subtypes were identified which closely resemble those of the intact retina.

Chick embryo retina was found to be a rich source of both muscarinic and nicotinic acetylcholine receptors. Both muscarinic and nicotinic acetylcholine receptors are synthesized before synapses appear in the retina; however, during development, nicotinic acetylcholine receptors become associated predominantly with neurites in the synaptic layers of the retina. Muscarinic acetylcholine receptors also were found to localize in the inner synaptic layer of the retina, but the receptor distribution differs from that of nicotinic acetylcholine receptors. The properties of muscarinic acetylcholine receptors were determined at different developmental ages and were compared with the properties of muscarinic inhibitory and excitatory receptors of neuroblastoma and hybrid cells.

Significance to Biomedical Research: Information was obtained which serves as a basis for further studies on the role of acetylcholine receptors in synapse formation.

Proposed Course: Further studies on receptor properties are planned.