GEORGIA INSTITUTE OF TECHNOLOGY
OFFICE OF CONTRACT ADMINISTRATION
SPONSORED PROJECT INITIATION

Date: *June 18, 1979*

Project Title: *Developmental - Genetic Regulation of Brain Tryptophan Transport*

Project No: *G-32-658* Green card

Project Director: *Dr. James A. Diez*

Sponsor: *National Science Foundation*

Agreement Period: From *6/15/79* Until *11/30/82 (Grant Period)*

Type Agreement: *Grant No. BNS-7905601, dated 6/8/79*

Amount: *$85,000 NSF*
4,474 GIT (G-32-327)
$89,474 TOTAL

Reports Required: *Annual Progress Reports; Final Project Report*

Sponsor Contact Person (s):

Technical Matters

NSF Program Official
Nathaniel G. Pitts
Assistant Program Director, Neurobiology Program
Neurosciences
Div. of Behavioral and Neural Sciences
Directorate for Biological, Behavioral and Social Sciences
National Science Foundation
Washington, D. C. 20550
202/634-4036

Contractual Matters
(thru OCA)

NSF Grants Official
Mr. Thomas F. Griffin
EBS/SE Branch
Division of Grants and Contracts
Directorate for Administration
National Science Foundation
Washington, D. C. 20550
202/632-7496

Defense Priority Rating: *n/a*

Assigned to: *Biology* (School/Laboratory)

COPIES TO:

Project Director
Division Chief (EES)
School/Laboratory Director
Dean/Director–EES
Accounting Office
Procurement Office
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EES Information Office
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Project File (OCA)
Project Code (GTRI)
Other_____

GEORGIA INSTITUTE OF TECHNOLOGY OFFICE OF CONTRACT ADMINISTRATION

SPONSORED PROJECT TERMINATION SHEET

Date July 12, 1983

Project Title: Developmental - Genetic Regulation of Brain Tryptophan Transport

Project No: G-32-658

Project Director: Dr. James A. Diez

Sponsor: National Science Foundation

Effective Termination Date: 11/30/82

Clearance of Accounting Charges: 11/30/82

Grant/Contract Closeout Actions Remaining:

- ☐ **Final Invoice and Closing Documents**
- ☒ **Final Fiscal Report** FCTR
- ☐ Final Report of Inventions
- ☐ Govt. Property Inventory & Related Certificate
- ☐ Classified Material Certificate
- ☐ Other

Assigned to: Applied Biology (School/~~Laboratory~~)

COPIES TO:

Administrative Coordinator	Research Security Services	EES Public Relations (2)
Research Property Management	Reports Coordinator (OCA)	Computer Input
Accounting	Legal Services (OCA)	Project File
Procurement/EES Supply Services	Library	Other Diez

FORM OCA 10:781

NATIONAL SCIENCE FOUNDATION
Washington, D.C. 20550

FINAL PROJECT REPORT
NSF FORM 98A

PLEASE READ INSTRUCTIONS ON REVERSE BEFORE COMPLETING

PART I–PROJECT IDENTIFICATION INFORMATION

1. Institution and Address	2. NSF Program	3. NSF Award Number
Georgia Institute of Technology Atlanta, Georgia 30332	Neurobiology	BNS-7905601
	4. Award Period From 6/15/79 To 11/30/82	5. Cumulative Award Amount $91,312

6. Project Title

Developmental-genetic regulation of brain tryptophan transport.

PART II–SUMMARY OF COMPLETED PROJECT *(FOR PUBLIC USE)*

The major aim of this project was to determine whether the system which transports tryptophan (TRP) across the neuronal cell membrane shows significant physiological variation due to genotype of developmental age. TRP is the precursor of the neurotransmitter serotonin; variations in TRP availability can alter serotonin synthesis, and thereby affect the many behaviors modulated by serotonin.

The membrane transport system for TRP was studied in synaptosomes (nerve endings) prepared from whole mouse brain; the accumulation of radioactive TRP was used to characterize the maximum transport rate (Vmax) and the affinity of the carrier for TRP (Km). The transport constants were measured in preparations from several strains of mice which show differing behavioral traits; developmental changes in the constants were studied from birth to sexual maturity (approx. 8 wks.).

The majot hypotheses of this study were confirmed: significant genetic differences in the Vmax and developmental changes in both the Km and Vmax for TRP transport were identified. Attempts to find a hormonal basis for the differences were not successful.

Experiments on the mechanism by which TRP is accumulated in synaptosomes have helped to resolve a controversy about how many carrier systems move TRP across the membrane. Our results indicate the existence of one system with relatively high affinity; the "low affinity" system which also appears in most TRP uptake studies seems to result from intra-cellular binding rather than movement across the membrane. These experiments also led to the discovery of a TRP-binding "phenomenon" in brain cell membrane fragments. This binding appears to behave much like a receptor for TRP, except that its dissociation constant (Kd) is relatively high (1 μm). The binding we measure could be to the carrier which transports TRP, except that it does seem to be unique to brain (we have not been able to measure it in liver, kidney, heart, erythrocytes, or platelets).

PART III–TECHNICAL INFORMATION *(FOR PROGRAM MANAGEMENT USES)*

1. ITEM *(Check appropriate blocks)*	NONE	ATTACHED	PREVIOUSLY FURNISHED	TO BE FURNISHED SEPARATELY TO PROGRAM	
				Check (✓)	Approx. Date
a. Abstracts of Theses				✓	7/15/83
b. Publication Citations				✓	7/15/83
c. Data on Scientific Collaborators	✓				
d. Information on Inventions	✓				
e. Technical Description of Project and Results				✓	7/15/83
f. Other *(specify)*					

2. Principal Investigator/Project Director Name *(Typed)*	3. Principal Investigator/Project Director Signature	4. Date
James A. Diez		5/18/83