

MATERIALS LICENSE

Amendment No. 16

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

301686

Licensee

In accordance with letter dated
July 31, 19963. License Number 34-00738-10 is amended
in its entirety to read as follows:

4. Expiration Date December 31, 2002

5. Docket or
Reference No. 030-30177

1. Case Western Reserve University
Dept. of Occupational
and Environmental Safety
2. 10900 Euclid Avenue
Cleveland, OH 44106

6. Byproduct, Source, and/or
Special Nuclear Material7. Chemical and/or Physical
Form8. Maximum Amount that Licensee
May Possess at Any One Time
Under This License

A. Cesium-137

A. Sealed sources
(J.L. Shepherd Model
No. 6810)

A. 12,000 curies

9. Authorized Use:

- A. To be used in a J.L. Shepherd, Mark I, Model 68 self-contained irradiator for the irradiation of small animals, biological samples, and inanimate objects (excluding explosive or flammable materials) for research purposes.

CONDITIONS

10. Licensed material shall be used only at the licensee's facilities located at Case Western Reserve University, Room B-47 of the Wearn Building or Room 350 of the Biomedical Research Building, Cleveland, Ohio.
11. Licensed material shall be used by, or under the supervision of, Oddvar Nygaard, Nancy Oleinick, P. Sridhar Rao, or Marie Varnes.
12. The Radiation Safety Officer for this license is W. David Sedwick, Ph.D. The Assistant Radiation Protection Officer for the activities authorized by this license is Karl Von Ahn.
13. A. Sealed sources and detector cells shall be tested for leakage and/or contamination at intervals not to exceed 6 months or at such other intervals as specified by the certificate of registration referred to in 10 CFR 32.210.

210066

9610210293 961003
PDR ADOCK 03030177
C PDR

COPY 2

9/1
mc
30
SD

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License Number

34-00738-10

Docket or Reference Number

030-30177

Amendment No. 16

- B. In the absence of a certificate from a transferor indicating that a leak test has been made within 6 months prior to the transfer, a sealed source or detector cell received from another person shall not be put into use until tested.
- C. Sealed sources need not be leak tested if:
- (i) they contain only hydrogen-3; or
 - (ii) they contain only a radioactive gas; or
 - (iii) the half-life of the isotope is 30 days or less; or
 - (iv) they contain not more than 100 microcuries of beta and/or gamma emitting material or not more than 10 microcuries of alpha emitting material; or
 - (v) they are not designed to emit alpha particles, are in storage, and are not being used. However, when they are removed from storage for use or transferred to another person, and have not been tested within the required leak test interval, they shall be tested before use or transfer. No sealed source or detector cell shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.
- D. The leak test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. Records of leak test results shall be kept in units of microcuries and shall be maintained for inspection by the Commission. If the test reveals the presence of 0.005 microcurie or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission and the source shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. The report shall be filed within 5 days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region III, 801 Warrenville Road, Lisle, Illinois 60532-4351, ATTN: Chief, Nuclear Materials Safety Branch. The report shall specify the source involved, the test results, and corrective action taken. Records of leak test results shall be kept in units of microcuries and shall be maintained for inspection by the Commission. Records may be disposed of following Commission inspection.
- E. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically licensed by the Commission or an Agreement State to Perform such services.

COPY

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License Number

34-00738-10

Docket or Reference Number

030-30177

Amendment No. 16

14. The licensee shall not perform repairs or alterations of the irradiator involving removal of shielding or access to the licensed material. Removal, replacement, and disposal of sealed sources in the irradiator shall be performed by a person specifically licensed by the Commission or an Agreement State to perform such services.
15. The licensee shall provide written operating and emergency procedures to each individual that uses the irradiator.
16. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The U.S. Nuclear Regulatory Commission's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.
 - A. Application dated September 17, 1992 (with attachments); and
 - B. Letters dated November 23, 1992, August 20, 1993 (with attachments) and July 25, 1994, July 7, 1995, November 8, 1995, July 24, 1996, and July 31, 1996.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date

10/3/96

By

Kevin G. Price

Nuclear Materials Licensing Branch, Region III

COPY

BETWEEN:

LICENSE FEE MANAGEMENT BRANCH, ARM
AND
REGIONAL LICENSING SECTIONS

(FOR LFMS USE)
INFORMATION FROM LTS

PROGRAM CODE: 03520
STATUS CODE: 0
FEE CATEGORY: EX 3E
EXP. DATE: 20021231
FEE COMMENTS: 170.11(A)(4)
DECOM FIN ASSUR REQD: N

R6

LICENSE FEE TRANSMITTAL

A. REGION

1. APPLICATION ATTACHED
APPLICANT/LICENSEE: CASE WESTERN RESERVE UNIVERSITY
RECEIVED DATE: 960802
DOCKET NO: 3030177
CONTROL NO.: 301686
LICENSE NO.: 34-00738-10
ACTION TYPE: AMENDMENT

2. FEE ATTACHED

AMOUNT: _____
CHECK NO.: _____

3. COMMENTS

SIGNED
DATE

M. McLean
8/4/96

B. LICENSE FEE MANAGEMENT BRANCH (CHECK WHEN LICENSE NO IS ENTERED / ☒)

1. FEE CATEGORY AND AMOUNT: EX 3E 170.11(A)(4)

2. CORRECT FEE PAID. APPLICATION MAY BE PROCESSED FOR:

AMENDMENT ☒
RENEWAL _____
LICENSE _____

3. OTHER

SIGNED
DATE

SC 8/14/96

RECEIVED

AUG 19 1996

REGION III

RECEIVED BY LFDCB

Date August 12, 1996

Log Aug 5 III

By SC

Date Completed 8/14/96



CASE WESTERN RESERVE UNIVERSITY

July 31, 1996

Materials Licensing Branch
US Nuclear Regulatory Commission, Region III
801 Warrenville Road
Lisle, Illinois 60532-4351

Re: Case Western Reserve University
NRC License Nos.
34-00738-04, 34-00738-07
34-00738-09, 34-00738-10, SNM-159

Dear Sirs,

This is a request to approve two new Radiation Safety Committee members for the licenses above.

The first approval request is for Dr. Thomas H. Large (curriculum vitae enclosed) as a voting Radiation Safety Committee member for Case Western Reserve University. We request that Dr. Large be approved for a three year term, starting August 8, 1996, and will replace Dr. Susan Payne.

The second approval request is for Dr. Hue-Lee Cheng Kaung (curriculum vitae enclosed) as a voting Radiation Safety Committee member for Case Western Reserve University. We request that Dr. Kaung be approved for a three year term, starting August 30, 1996, and will replace Dr. Carole Liedtke.

If you have any questions, please call me at 216-368-2906.

Sincerely,

Dr. David Sedwick
Radiation Safety Officer

cc: Dr. Agnar Pytte, President of CWRU
Dr. Christopher Town, Chairperson RSC
Kenneth Basch, Assistant Treasurer
Karl Von Ahn, Asst. RSO

170.11(A)(4)
FEE EXEMPT

AUG 19 1996
301686

Department of Occupational & Environmental Safety

MAILING ADDRESS
Case Western Reserve University
2220 Circle Drive, First Floor
Cleveland, Ohio 44106-7227

VISITORS AND DELIVERIES
Service Bldg. First Floor

Phone 216-368-2906
Fax 216-368-2236

RECEIVED

AUG 2 - 1996

0101 7-31-96

THOMAS H. LARGE

Education:

1985 - 1989

UCSF Medical School
Postdoctoral Fellowship

1980-1985

Northwestern University,
Evanston, Illinois
PhD Neurobiology and Physiology

1976-1979

Northwestern University, Evanston, Illinois
Dual Major: Integrated Science Program and Biology

Honors:

McKnight Award, Finalist
NIH Postdoctoral Fellowship
NIMH Pre-doctoral Fellowship
Fellowship in Reproductive Biology
Northwestern University Teaching Fellowship
Honors/Masters Program in Biology
NSF Undergraduate Integrated Science Program

Professional Experience:

July 1992 -
present

Assistant Professor
Division of General Medical Sciences (Oncology)
Case Western Reserve University School of Medicine

January 1990 -
present

Assistant Professor
Department of Neurosciences
Case Western Reserve University School of Medicine
Cleveland, Ohio 44106-4975

June 1986 -
Dec 1989

Associate
Howard Hughes Medical Institute
Univ. of California Medical School
San Francisco, California 94143

August 1985 -
May 1986

Postdoctoral Fellow
Dept. of Physiology
Univ. of California Medical School

Selected Memberships:

1994-1996

Ad hoc and regular member, NLS-1 Study Section

1994-1995

Ad hoc member, NEI VisC Study Section

1994

Ad hoc member, NICHD Site Visits

1994

Ad hoc reviewer for NSF

1991-1996

American Heart Association Study Section

1991

Ad hoc member, NIA/NINDS Alzheimer's Disease Study Section

Reviewer for Journals:

Science

Neuron

J. Neuroscience

Developmental Biology

Neuroscience Letters

Endocrinology

J. Cell Biology

TRAINING RECORD

Current Postdoctoral Fellows:

Voci, Matt; 1991 -

MD 1987 Univ. of Pennsylvania

Physician Scientist Award

Kim, Paul, 1994-

MD 1992 Temple Univ.

Current Predoctoral Students:

Camer, Andrew (MD/PhD); 1990 -

BA 1989 Swarthmore

MSTP Training Grant

Harry Menegay (PhD); 1991 -

BA 1988 Akron Univ.

Kristen Baeshore (PhD); 1993 -

BA 1992 Lebanon Valley College

Past Postdoctoral Fellows:

Xia, Xiao-Yi; 1991 - 1992

PhD 1990 Univ. of Miami School of Medicine

American Heart Association Fellowship

Bethes, John; 1991 - 1994

PhD 1991 University of Alabama, Birmingham

NRSA

McKeon, Robert; 1991 - 1994

PhD 1989 University of Vermont

(co-sponsored by Jerry Silver)

Past Undergraduates:

Dalia Elkhairi; 1990 - 1993

currently MD student, Ohio State

Venus Paxton; 1991 - 1994

currently research associate, CWRU

Past Minority Students:

Cynthia Long - currently MD student, CWRU

Victoria Fibley - currently MD student, CWRU

Nate Russell - currently MD student, CWRU

Wick Marvin - currently undergraduate

Jason Ross - currently undergraduate

Tannishia Goggans - currently undergraduate

Past Support:

- A) NIH (NRSA award to John Bethea, PhD)
 - B) "Effect of NT4 Gene AKnockout on Mouse Development."
 - C) 11/1/92 - 10/31/94
 - D) \$45,000 TDC
-
- A) Bristol-Meyers Squibb Fellowship Program for Minority Medical Students (Cynthia Long)
 - B) Sponsor, 0% effort
 - C) 6/15/93 - 12/31/93
 - D) \$6,000 TDC
-
- A) Gilletech, Inc.
 - B) "Identification and Expression of NGF-related Trophic Factors."
 - C) 1/1/91 - 6/30/93
 - D) \$100,000 TDC
-
- A) American Heart Association Postdoctoral Fellowship (Xiao-Yi Xie, PhD)
 - B) Sponsor, 0% effort
 - C) 7/1/91 - 6/30/93
 - D) \$42,000 TDC; \$21,000 ADC
-
- A) American Cancer Society Joseph S. Silber Student Fellowship (Venus Paxton)
 - B) Sponsor, 0% effort
 - C) 6/1/92 - 8/31/92
 - D) \$1,500 TDC
-
- A) Association for Academic Minority Physicians/Merck Summer Fellowship (Victoria Fribley)
 - B) Sponsor, 0% effort
 - C) 6/1/92 - 8/31/92
 - D) \$5,000 TDC
-
- A) Research Initiation Grant (Ohio Regents): "Identification and Cloning of Novel Neurotrophic Factors Related to Nerve Growth Factor"
 - B) 0% effort
 - C) 06/01/90 - 05/31/91
 - D) \$5,000 TDC

Training Grants:

- Developmental Neurology - PI: Story Landis, Dept. of Neurosciences
#N507118 7/1/89 - 6/30/93 2 pre / 4 post
- Normal and Abnormal Development - PI: Urs Rutishauser, Dept. of Genetics
#HD07104 7/1/91 - 6/30/96 6 pre / 3 post
- Cell and Molecular Biology - PI: Fritz Rottman, Dept. of Microbiology and Molecular Biology
#GM08056 7/1/92 - 6/30/97 8 postdocs
- Pharmacology - PI: John Nilson, Dept. of Pharmacology
pending
- Research Oncology Training Grant - Nathan Berger, Ireland Cancer Center
#CA43700 7/1/93 - 6/30/98 3/4 postdocs

- Barker, P.A., Miller, F.D., Large, T.H. and Murphy, R.A. (1991) The Schwann cell-derived truncated form of the NGF receptor arises from post-translational processing. *Soc. Neurosci. Abstr.* 17, 1116.
- Ignatius, M.J., Large, T.H., Houde, M., Tawil, J.W., Barton, A., Carbonetto, S. and Reichardt, L.F. (1991) Molecular cloning of the rat integrin alpha-1 subunit: A receptor for laminin and collagen. *Soc. Neurosci. Abstr.* 17, 207.
- Ignatius, M.J., Large, T.H., Houde, M., Tawil, J.W., Barton, A., Esch, P., Carbonetto, S. and Reichardt, L.F. (1990) Molecular cloning of the rat integrin alpha-1 subunit: A receptor for laminin and collagen. *ASCB Abstr.* 111, 142a.
- Roback, J.D., Downen, M., Lee, H.J., Zucker, J., Large, T.H., Otten, U. and Wainer, B.H. (1990) NGF and NGF receptor expression in primary reaggregate cultures derived from the embryonic mouse septum. *Soc. Neurosci. Abstr.* 16, 988.
- Roback, J.D., Large, T.H., Otten, U. and Wainer, B.H. (1989) Expression of NGF mRNA and protein in the developing hippocampus in vitro. *Soc. Neurosci. Abstr.* 15, 364.
- Large, T.H., Weskamp, G. and Reichardt, L.F. (1988) Structure and developmental expression of the NGF receptor in chick brain. *Soc. Neurosci. Abstr.* 14, 902.
- Lee, H.J., Hammond, D.N., Large, T.H. and Wainer, B.H. (1988) Expression of NGF by permanent cell lines derived from postnatal hippocampus. *Soc. Neurosci. Abstr.* 14, 365.
- Roback, J.D., Wainer, B.H. and Large, T.H. (1988) The expression of NGF protein in the developing hippocampus in reaggregate culture. *Soc. Neurosci. Abstr.* 14, 303.
- Hammond, D.N., Wainer, B.H., Heller, A., Large, T.H. and Reichardt, L.F. (1987) Clonal hybrid cell lines derived from primary hippocampal cells express nerve growth factor (NGF) mRNA and Protein. *IBRO Abstr.*
- Large, T.H., Bodary, S.C., Clegg, D.O., Weskamp, G., Otten, U. and Reichardt, L.F. (1986) Regulation of nerve growth factor mRNA and protein levels in the developing rat brain. *Soc. Neurosci. Abstr.* 12, 587.
- Large, T.H., Rauh, J.J., Cho, N.J., Skorupa, A.F. and Klein, W.L. (1985) Mr 72,000 and Mr 86,000 forms of muscarinic ACh receptors in avian CNS: Shift in predominant form during development. *Soc. Neurosci. Abstr.* 11, 655.
- Large, T.H., Rauh, J., and Klein, W.L. (1984) Molecular alteration of muscarinic acetylcholine receptors during synaptogenesis. *Soc. Neurosci. Abstr.* 10, 1042.
- Large, T.H., Cho, N.J., and Klein, W.L. (1983) Muscarinic responses in avian retina develop prior to synaptogenesis. *Soc. Neurosci. Abstr.* 9, 693.
- Gremillion, M.A., Large, T.H., and Klein, W.L. (1983) Development of muscarinic acetylcholine receptor binding in the rat olfactory bulb. *Soc. Neurosci. Abstr.* 9, 649.
- Large, T.H., Chin, H., Ralthe, D.J., and Klein, W.L. (1981) Separation and characterization of nicotinic receptors using bromoacetylcholine. *Soc. Neurosci. Abstr.* 7, 497.
- Large, T.H., Siman, R.G., and Klein, W.L. (1980) Use of ³H-bromoacetylcholine to label nicotinic acetylcholine receptors from the central nervous system. *Soc. Neurosci. Abstr.* 6, 754.

SUPPORT

1) Present:

- A) NIH
 - B) EY08885-02 - "Role of Nerve Growth Factor in Retinal Development."
 - C) 12/1/90 - 11/30/95 (5 years)
 - D) \$500,000 TDC
-
- A) NIH (PSA award James M. Voel)
 - B) AG00333-01 - "Neurotrophin 4: Characterization of a Novel Neurotrophic Factor."
 - C) 7/1/91 - 6/30/96 (5 years)
 - D) \$375,000 TDC
-
- A) NIH (Program Project, Nathan Berger, PI)
 - B) 1 P20 CA60171-01 - "Receptor Targeted Protein Toxins for Brain Tumor Therapy."
 - C) 4/1/93 - 3/31/96 (3 years)
 - D) \$60,000 TDC for subproject

Large, T.H., Bodary, S.C., Clegg, D.O., Weskamp, G., Otten, U. and Reichardt, L.F. (1986) Nerve growth factor gene expression in the developing rat brain. *Science* 234, 352-355.

Large, T.H., Cremonini, M.A., and Klein, W.L. (1986) Cholinergic development in the rat olfactory bulb: Parallel development of choline acetyltransferase and muscarinic acetylcholine receptors. *J. Neurochemistry* 46, 671-680.

Large, T.H., Lambert, M.P., Cohen, N.M., and Klein, W.L. (1986) Autonomous control of phosphatidylinositol turnover by histamine and acetylcholine receptors in the N1E-115 neuron-like cell line. *Neuroscience Letters* 66, 31-38.

Large, T.H., Rauh, J.J., DeMello, F.G. and Klein, W.L. (1985) Two molecular weight forms of muscarinic acetylcholine receptors in the avian central nervous system: Switch in predominant form during differentiation of synapses. *Proc. Natl. Acad. Sci. USA* 82, 8785-8789.

Large, T.H., Cho, N.J., DeMello, F.G., and Klein, W.L. (1985) Molecular alteration of a muscarinic acetylcholine receptor system during synaptogenesis. *J. Biological Chemistry* 260, 8873-8881.

Chapters and Reviews:

Reichardt, L.F., Bossy, B., Emmett, E., Lafcort, P., Hall, D., Ignatius, M., Large, T., Neugebauer, K., Napolitano, E. and Tomaselli, K. (1990) Neuronal glycoproteins that regulate axon extension in LV Cold Spring Harbor Symposium on Quantitative Biology vol. LV, pp. 341-350.

Clegg, D.O., Bodary, S.C., Large, T.H., Shelton, D.L. and Reichardt, L.F. (1989) Quantitative measurement of nerve growth factor mRNA in *IBRO Handbook Series: Nerve Growth Factors*. (Rush, R.A., ed), John Wiley and Sons, Chichester, England. p. 255-275.

Abstracts:

- Boeshore, K., Garner, A.S. and Large, T.H. (1996) Deletion in the extracellular domain of *trkB* results in decreased responsiveness to NT3 stimulation in fibroblasts. *Soc. Neurosci. Abstr.* 21, .
- Oakley, R.A., Garner, A.S., Large, T.H. and Frank, E. (1996) Target dependent and independent expression of *trkC* transcripts in developing sensory neurons. *Soc. Neurosci. Abstr.* 21, .
- Oakley, R.A., Large, T.H. and Frank, E. (1994) Differential distribution of *trkC*-positive sensory neurons in spinal ganglia. *Soc. Neurosci. Abstr.* 20, 856.
- Voc, J.M., McKeon, R.J. and Large, T.H. (1993) Retroviral delivery of neurotrophin genes into embryonic chick retinas. *Soc. Neurosci. Abstr.* 19, 722.
- Garner, A.S. and Large, T.H. (1993) Alternate splicing of the *trkC* tyrosine kinase dissociates process outgrowth from survival. *Soc. Neurosci. Abstr.* 19, 1477.
- Johnson, J.E., Wang, S.W., Boeshore, K., Garner, A.S., Large, T.H., McKay, S.E. and Oppenheim, R.W. (1993) *In situ* hybridization of *trkB* in the developing chick visual system and brain. *Soc. Neurosci. Abstr.* 19, 1298.
- McKay, S.E., Herzog, K.H., Garner, A., Tucker, R.P., Oppenheim, R.W. and Large, T.H. (1993) Expression of BDNF and *trkB* during the development of the neuromuscular system in the chick embryo. *Soc. Neurosci. Abstr.* 19, 516.
- Oakley, R.A., Garner, A.S., Large, T.H. and Frank, E. (1993) Differential distribution of *trkC*-positive sensory neurons in spinal ganglia. *Soc. Neurosci. Abstr.* 19, 1300.
- McKeon, R.J., Silver, J. and Large, T.H. (1993) Identification of *trkD* receptor mRNA in astrocytes both *in vitro* and after cortical injury. *Soc. Neurosci. Abstr.* 19, 1477.
- Xie, X.-Y., Garner, A.S., Voc, J.M. and Large, T.H. (1992) Neurotrophin expression in the developing chick retina. *Soc. Neurosci. Abstr.* 18, 1289.
- Garner, A.S. and Large, T.H. (1992) Evidence for kinaseless and alternate 5' terminal forms of *trkB* and *trkC* in chick. *Soc. Neurosci. Abstr.* 18, 950.
- Voc, J.M. and Large, T.H. (1992) Cloning of chick BDNF: Tectal factor and potential alternate precursors. *Soc. Neurosci. Abstr.* 18, 615.

Articles:

- Oakley, R.A., Garner, A.S., Large, T.H. and Frank, E. (1996) Target dependent and independent expression of *trkC* in the dorsal root ganglia of the chick embryo. (in prep)
- McKeon, R., Silver, J. and Large, T.H. (1996) Reactive astrocyte expression of full length *trkB* receptors. (in prep).
- McKay, S.E., Homma, S., Matheson, C., Garner, A., Large, T.H., Yan, Q. and Oppenheim, R.W. (1996) Neurotrophin binding and transport by sensory and motor neurons. *J. Neurobiology* (submitted).
- Voci, J.M., Menegay, H.J., Xie, X.-Y., Johnson, J.E. and Large, T.H. (1996) Retroviral delivery of BDNF to the embryonic eye rescues target-deprived retinal ganglion cells. *J. Neuroscience* (submitted).
- Garner, A.S., Voci, J.M., Boeshore, K., Xie, X.-Y., Johnson, J.E. and Large, T.H. (1996) Expression of *trkB* isoforms in the developing avian visual system. *J. Neuroscience* 16, 1740-1752.
- McKay, S.E., Garner, A., Caldero, J., Tucker, R.P., Large, T.H. and Oppenheim, R.W. (1995) *trkD* and *p75* expression in the developing neuromuscular system of the chick embryo. *Development* 122, 715-724.
- Henion, P.D., Garner, A.S., Large, T.H. and Weston, J.A. (1995) *TrkC*-mediated NT3 signaling is required for the early development of a subpopulation of neurogenic neural crest cells. *Developmental Biology* 172, 602-613.
- Oakley, R.A., Garner, A.S., Large, T.H. and Frank, E. (1995) Neurotrophin-3 deprivation selectively enhances the death of sensory neurons that supply muscle spindles. *Development* 121, 1341-1350.
- Garner, A.S. and Large, T.H. (1994) Isoforms of the avian *trkC* receptor: A novel kinase insertion dissociates transformation and process outgrowth from survival. *Neuron* 13, 457-472.
- Roback, J.D., Diede, S., Downen, M., Lee, H.J., Kwon, J., Large, T.H., Otten, U. and Wainer, B.H. (1992) Expression of neurotrophins and the low-affinity NGF receptor in septal and hippocampal reagregate cultures: Local physiological effects of NCF synthesized in the septal region. *Developmental Brain Research* 70, 123-133.
- Barker, P.A., Miller, F.D., Large, T.H. and Murphy, R.A. (1991) Generation of the truncated form of the NGF receptor by rat Schwann cells: Evidence for post-translational processing. *J. Biol. Chem.* 266, 19113-19119.
- Ignatius, M.L., Large, T.H., Houde, M., Tawil, J.W., Barton, A., Esch, F., Carbone, S. and Reichardt, L.F. (1990) Molecular cloning of the rat integrin α -1 subunit: A receptor for laminin and collagen. *J. Cell Biology* 111, 709-720.
- Lee, H.J., Hammond, D.N., Large, T.H., Roback, J.D., Sim, J.A., Brown, D.A., Otten, U. and Wainer, B.H. (1990) Neuronal properties and trophic activities of immortalized hippocampal cells from embryonic and young adult mice. *J. Neuroscience* 10, 1779-1787.
- Lee, H.J., Hammond, D.N., Large, T.H. and Wainer, B.H. (1990) Immortalized young adult neurons from the medial septal region: Generation and characterization. *Developmental Brain Research* 52, 219-228.
- Roback, J.D., Large, T.H., Otten, U. and Wainer, B.H. (1990) Nerve growth factor expression in the developing hippocampus isolated in vitro. *Developmental Biology* 137, 451-455.
- Large, T.H., Weskamp, G., Helder, J.C., Radeke, M., Misko, T., Shooter, E.M. and Reichardt, L.F. (1989) Structure and developmental expression of the nerve growth factor receptor in the chicken central nervous system. *Neuron* 2, 123-134.
- Clegg, D.O., Large, T.H., Bodary, S.C. and Reichardt, L.F. (1989) Regulation of NGF mRNA levels in developing rat heart ventricle is not altered by sympathectomy. *Developmental Biology* 134, 30-37.

BIOGRAPHICAL SKETCH

NAME: Kaung, Hue-lee Cheng

EDUCATION

National Taiwan University, Taipei, Taiwan	BS	1962	Zoology
University of Iowa, Iowa City, Iowa	MS	1964	Zoology
University of Iowa, Iowa City, Iowa	PhD	1971	Zoology

POSTDOCTORAL TRAINING

Postdoctoral fellow, USPHS Diabetes Research Training Grant, Department of Anatomy, University of Minnesota

ACADEMIC APPOINTMENTS

Assistant Professor, Department of Anatomy, University of Minnesota, 1974-1984

Assistant Professor, Department of Pediatrics, Case Western Reserve University, 1984-present

Assistant Professor, Joint Appointment, Department of Anatomy, Case Western Reserve University, 1984-present

PROFESSIONAL SOCIETY

The endocrine society

RESEARCH INTEREST

Comparative studies of endocrine pancreas in vertebrates

Development of endocrine pancreas

Pancreatic islet cell line development

MAJOR TEACHING EXPERIENCE

Lecturer and laboratory instructor, **Human Histology** for medical students, Department of Anatomy, University of Minnesota. 1974-1984

Course director, **Human Anatomy and Physiology** for allied health sciences students, Department of Anatomy, University of Minnesota. 1978-1980

Lecturer and laboratory instructor, **Human Histology**, Medical student curriculum Phase I and II. Department of Anatomy, Case Western Reserve University 1984-Present

RECENT PUBLICATIONS

Vadlamudi S, Hiremagalur BK, Tao L, Kalhan S, Kalaria R, Kaung HC and Patel MS 1993 Long-term effects on pancreatic function of feeding a high-carbohydrate formula to rats during the preweaning period. *Am. J. of Physiology* E565-E571.

Kaung HC 1994 Growth dynamics of pancreatic islet cell populations during fetal and neonatal development of the rat. *Dev. Dynamics* 200:163-175

Kaung, HC, Xu S, Wang C, Jacobberger J and Chen W 1996 Rat islet cell lines produced by retroviral transduction of SV40 T antigen. *In Vitro Cell. Dev. Biol. -Animal* 32:197-203.