March 2021

EDISON TAK-BUN LIU, M.D.
CURRICULUM VITAE

Place of Birth:	Hong Kong, China
Citizenship:	USA (Singapore Permanent Residency)
Work Address:	The Jackson Laboratory 600 Main Street Bar Harbor, Maine 04609
Telephone:	+207-288-6041 (work)
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Marital Status:	Married with three children

Education

Oct. 1969 - June 1973	Stanford University, B.S. Chemistry, Psychology
Oct. 1973 - June 1978	Stanford University, M.D.

Post Graduate Training

July 1978 - July 1979	Internship, Barnes Hospital - Washington University, St. Louis
July 1979 - July 1980	Residency, Barnes Hospital - Washington University, St. Louis
July 1980 - July 1982	Oncology Fellowship, Stanford University
July 1982 - July 1985	Hematology Fellowship, University of California San Francisco, Moffitt Hospital
Dec. 1983 - July 1987	Postdoctoral Fellow - Dept. of Microbiology, University of California at San Francisco, CA (Dr. J. Michael Bishop)

Appointment History

Jul 1985 - Jun 1987	Instructor, Department of Medicine, Division of Oncology (University of California at San Francisco)
Jul 1987 - Jun 1993	Assistant Professor in Medicine and Oncology, School of Medicine University of North Carolina at Chapel Hill
Jan 1988 - Jul 1993	Director Preleukemic Clinic, North Carolina Memorial Hospital, UNC Chapel Hill

Jan 1988 - Sept 1996	Faculty, Curriculum in Genetics, University of North Carolina at Chapel Hill
Jul l989 - Jun 1991	Director, Hematology/Oncology Training Program, University of North Carolina at Chapel Hill
Aug l989 - Jul 1992	Director, DNA Tumor Bank, Lineberger Cancer Research Center, UNC Chapel Hill
Jul 1992 - Sept 1996	Co-Director: Laboratory of Molecular Epidemiology, UNC Chapel Hill, School of Public Health
Feb 1993 -Sept 1996	Leader, Breast Cancer Program, Lineberger Comprehensive Cancer Center, University of North Carolina at Chapel Hill
Jul 1993 - Aug 1995	Associate Professor, Department of Epidemiology, University of North Carolina at Chapel Hill
Jul 1993 - Aug 1995	Associate Professor, Department of Medicine, University of North Carolina at Chapel Hill
Jul 1993 - Sept 1996	Chair, Solid Tumor Correlative Sciences Committee; Cancer and Leukemia Group B
Sept 1992- Sept 1996	Director, Specialized Program of Research Excellence in Breast Cancer (NIH Designated). UNC Chapel Hill
Aug 1995 - Sept 1996	Faculty, Department of Biochemistry and Biophysics, University of North Carolina at Chapel Hill.
Aug 1995 - Sept 1996	Professor, Departments of Medicine, Epidemiology, Biochemistry and Biophysics. UNC Chapel Hill
Dec 1995 -Sept 1996	Chief, Division of Medical Genetics, University of North Carolina at Chapel Hill School of Medicine
Mar 1996 - Sept 1996	Member, Board of Scientific Advisors, National Cancer Institute
Sept 1996 – Mar 2001	Director, Division of Clinical Sciences, National Cancer Institute, Bethesda, MD
Jun 1997 – Mar 2001	Chief, Molecular Signaling and Oncogenesis Section, Department of Cell and Cancer Biology, Medicine Branch, Division of Clinical Sciences, National Cancer Institute
March 2001 – December 2011	Executive Director, Genome Institute of Singapore
March 2001 – present	**Professor of Medicine, Yong Loo Lin School of Medicine. National University of Singapore (until 2017),**
March 2001 – May 2008	Special Advisor to the President, National University of Singapore
November 2001 – present	**Professor, Department of Epidemiology and Public Health, National University of Singapore**
May 2002 – November 2009	Executive Director, Singapore Tissue Network (National DNA Repository)
February 2003 – February 2008	Executive Director, Singapore Cancer Syndicate (a funding agency)
January 2005 – present	**Adjunct Professor of Molecular and Cellular Biology at University of Illinois, Urbana-Champaign**
2005 – 2008	Visiting Scientist. RIKEN Institute. Japan
November 2006 – 2008	Adjunct Professor of Johns Hopkins Division of Molecular Medicine Department of Medicine

2009 – 2011	Adjunct Professor, Nanyang Technology University (Singapore)
2010 – present	**Honorary Joint Professor, Department of Biochemistry, Yong Loo Lin School of Medicine, National University of Singapore**
January 2012 - present	**President and CEO, The Jackson Laboratory**
January 2013 – present	**Professor in the Department of Genetics and Developmental Biology, University of Connecticut Health Center**
January 2013 – present	**Director, The Jackson Laboratory Cancer Center (NCI Designated)**

Current Position

President and CEO, The Jackson Laboratory

The Jackson Laboratory, established in 1929, is the key institution for mouse genetics that has 2,000 full time employees, 68 Principal Investigators now in three campuses (Maine, California, and Connecticut). The annual operating budget is $500 million dollars (2020). In 2011, the State of Connecticut appropriated $291 million for the building of a 175,000 sq ft building for the Jackson Laboratory. The President is responsible for the operations, recruitment, and strategy for the institution. In the last nine years, we have increased the operating budget by 100%, doubled the faculty, entered into translational and clinical sciences, and expanded our physical footprint to include four campuses in three states, and initiated a business component in China. In the process, The Jackson Laboratory moved from a singular focus on mouse genetics to becoming a national center for complex genetics and functional genomics using the mouse and the human as model systems.

Director, The Jackson Laboratory Cancer Center

The Jackson Laboratory is an NCI designated basic cancer center in its 28^{+} year. As its Director, I successfully took the cancer center through two successful competitive renewals in 2014 and 2019. We have expanded the cancer center to 52 members (of 71 faculty) and have increased our NCI funding by 3-fold. We now have an impactful presence in translational cancer medicine and are engaged in genomic diagnostics and therapeutics. Our strategy is to focus on "precision models for cancer biology" and to use cutting edge technologies to attack problems in cancer biology and therapeutics.

Previous Executive Positions

President, Human Genome Organization (HUGO)(June 2007 – May 2013)

HUGO is the professional organization of genomicists and geneticists involved in the science of the human genome. The Presidency is a 3 year term and is elected by the HUGO Council. Upon election in summer of 2007, I moved to balance the finances of the organization, moved the office from London to Singapore, and to reinvigorate the mission and focus of HUGO towards Genomic Medicine and to realize the aspirations of emerging countries. In my presidency, I have initiated a new journal for HUGO in collaboration with Springer Publishing Group (HUGO Journal), established the HUGO Pan Asian SNP Initiative, launched new formats in workshops and the annual HGM meetings, and formulated new international collaborative links in Asia, South America, and the Middle East.

Executive Director, Genome Institute of Singapore (GIS) (2001-2012)

The Genome Institute of Singapore is to establish the academic framework for genomic resources in Singapore; to conduct cutting edge genomic science; to provide the infrastructure and training in

genomics for Singapore and the region; and to attract R&D ventures in biomedicine into Singapore. As the founding director, I built the institute from 3 individuals to the current 280 staff members covering the areas of genomic technologies, computational biology, population genetics, and cell biology. The executive director has jurisdiction over budget, space, recruitment, and scientific direction. Moreover, the executive director is a senior advisor to the Singapore government for matters pertinent to genomic sciences, including educational reform, and pandemic response.

Chairman, Governing Board, Health Sciences Authority of Singapore (HSA)(February 2007-2011)

The HSA is the major health regulatory authority for Singapore responsible for pharmaceutical regulation, national blood banking, and forensics. Therefore, the HSA is the US FDA, Red Cross, and FBI Forensics Laboratory inclusive. As a statutory board, the HSA is managed by a CEO, and governed by a board comprising scientific, medical, governmental, business leaders. The chairman of the HSA board is responsible for conduct of the governing board whose responsibilities include strategic and financial oversight, approvals of key appointments, and major policy positions. In this capacity, I have initiated with the CEO a number of sweeping changes regarding drug approval processes, organizational structure, human resource management, and the establishment of a research academy within the HSA.

Founding Executive Director, Singapore Cancer Syndicate (2003-2008)

The Singapore Cancer Syndicate (SCS) is a unique funding agency that seeks to coordinate and empower translational cancer research in Singapore. S$75 Million was allocated for five years (2003-2008) to fund in a managed fashion, the hardening of the infrastructure that supports the clinical translational research pipeline of the country. The SCS is supporting cancer clinical trials groups, molecular pathology, bone marrow transplantation, GMP facilities, biomarker discovery, and pharmacokinetics and pharmacodynamics units. All funded groups have milestones which were the criteria for continued funding. This initiating funding mechanism spawned an expansion of cancer related funding nationally to ~300 million dollars. At the end of the 5 year funding (2003-2008), the cancer syndicate, having successfully completed its mission, was closed.

Founding Executive Director, Singapore Tissue Network (2002-2009)

As the founding director of the Singapore Tissue Network, I conceived and established the first national tissue and DNA bank for Singapore. I recruited staff, arranged training, and established governance and policies. To date, the STN holds over 40,000 tissue entries, and is the major national repository for DNA and serum. It has participated in national deliberations over ethical guidelines for genetic research, and tissue procurement policies.

Director of the Division of Clinical Sciences, NCI (1996-2001)

The National Cancer Institute has three intramural divisions that conduct research at the Maryland campus of the NIH: Clinical Sciences, Basic Sciences, and Cancer Epidemiology and Genetics. The Division of Clinical Sciences has a total of 1,200 employees organized in 16 branches/laboratories/departments, and include 100 principal investigators, 40 staff clinicians, and approximately 360 M.D. and Ph.D. trainees, as well as pre- to post-baccalaureate level individuals. The DCS is responsible for the clinical and clinical translational research for the NCI intramural program, and conducts investigations spanning basic laboratory research to clinical trials, and epidemiologic studies. The Division Director has jurisdiction over budget, personnel, space management, scientific initiatives and scientific review within their divisions.

Chairman, Solid Tumor Correlative Sciences Committee; Cancer and Leukemia Group B (CALGB) (1993 – 1996)
In the US, cancer phase II and III clinical trials are conducted by NCI funded National Cooperative Groups. CALGB was one of the major cancer clinical cooperative groups that organized clinical trials over all cancer types. In 1993, I was asked to initiate a working committee to coordinate all clinical translational scientific work in solid tumors for the cooperative group. My responsibilities were to organize and lead the molecular translational sciences for this national cooperative clinical trials group in oncology in solid tumors In this position, I formulated the review process, and coordinated the execution of the plans. I was the PI or co-PI in competitive national cooperative translational network grants (U01 and U10 mechanisms) for the CALGB to fund these efforts.

Director/Principal Investigator, Specialized Programme of Research Excellence in Breast Cancer (NCI) (1992-1996)
In 1991, the NCI embarked on a new large scale programme to focus on integrated translational sciences targeting specific cancers. At that time, the allowable direct cost of $1.5 million USD per year for a research programme was unique and rivaled the cancer center programme. I led the proposal from the University of North Carolina, Chapel Hill focusing on Molecular Epidemiology of breast cancer and was the one of the first three recipients of this new grant mechanism. As Principal Investigator, I had fiscal and scientific responsibility over the University programme, talent recruitment, and was the primary liaison with the National Cancer Institute.

Board Certification
Internal Medicine - Certified 1983
Hematology - Certified 1984
Oncology - Certified 1985

Professional Licensure
California - G42337 (inactive status)
Missouri - R1A59 (inactive since 1991)
North Carolina – 15208 (inactive status)

Professional Organizations
American Society for Clinical Investigation (elected)
Cancer and Leukemia Group B: Chair, Solid Tumor Correlative Sciences Committee (resigned 1996)
Human Genome Organization (HUGO)
Southwest Oncology Group
Association of American Cancer Institutes
American Society of Human Genetics
American Association for Cancer Research

Special Honors and Awards

1972 June-Sept.	National Science Foundation Fellowship in Chemistry 1972: To study the photoconversion of aziridines to ethylene for its agriculture applications. Preceptor: Dr. J. D. White
1973 June	Phi Beta Kappa, Stanford University
1974 July-Sept.	Ford Foundation Fellowship for Intensive Studies in Chinese, Stanford University

1983-1985	Damon Runyan Cancer Fund Fellowship Preceptor: Dr. J. Michael Bishop (UCSF)
1985-1988	Clinical Investigator Award, National Cancer Institute, K08-CA01036-02, Preceptor: Dr. J. Michael Bishop.
1990-1994	Jefferson Pilot Award: University of North Carolina at Chapel Hill, Junior Faculty Award for Research Excellence
1991-1996	Leukemia Society Scholar
1995 July	American Society of Clinical Investigation (Elected Membership)
1996 October	1996 Brinker International Award for Breast Cancer Research - Basic Research Award
1999-2001	Elected-Board of Directors, American Association for Cancer Research
2000 April	Rosenthal Award, AACR: for the discovery that HER-2 status determines response to adjuvant chemotherapy with doxorubicin.
September 2003	Public Service Medal (National Day, 2003): for work in controlling SARS in Singapore (given by the Office of the President, Republic of Singapore)
2007-2010	Elected – President, Human Genome Organization (HUGO)
2007 July	Awarded Doctor of Medical Sciences honoris causa, Queen's University, Belfast
2008 September	Elected, Foreign Associate Member, European Molecular Biology Organization (EMBO)
2010-2013	Re-elected - President, Human Genome Organization (HUGO)
2010 October	Fellow of the Hastings Center (New York, Elected Membership)
2013 January	Elected, Fellow of the Connecticut Academy of Sciences and Engineering
2014 April	2014 Chen Award for Distinguished Academic Achievement in Human Genetic and Genomic Research (from the Human Genome Organization)
2016 May	Awarded Doctor of Sciences honoris causa, Colby College, Waterville, Maine
2016 November	Elected, American Association for the Advancement of Science (AAAS) Fellow
2017	50th Anniversary Founding of the Republic of Singapore- Announced: One of 50 most important foreigners in Singapore's history
2018-present	Elected, Board of Directors, American Association for Cancer Research
2020 May	Awarded Doctor of Humane Letters honoris causa, University of Southern Maine, Portland, Maine
2021 April	Awarded: Business Leader of the Year. Mainebiz

Editorial Boards (bold = current appointments)

BMC Genomics: Editorial Board (2005-present)

Breast Cancer Research (Current Opinions): Associate Editor (2001 -2012)

Breast Cancer Treatment and Research: Associate Editor

Breast Disease: Editor-in-Chief (1999 - 2007)

Breast: Editorial Board (completed 1999)

Cancer Letters (Completed 2002)
Cancer Therapeutics (Completed 1999)
Clinical Cancer Research: Associate Editor (2001- 2012)
Current Cancer Drug Targets (completed 2002)
Current Opinion in Oncology (2005-2009)
Encyclopedia of Diagnostic Genomics and Proteomics (2002-2010)
Faculty of 1000, contributing faculty (Physiogenomics) (2005-2006)
Genome Biology (2001-present)
Genomic Medicine (2007-2009)
Journal of Clinical Oncology (completed 1998)
Journal of Mammary Gland Biology and Neoplasia (1999 - 2006)
Journal of Translational Medicine (2003-present)
Lancet Oncology (2005-present)
Leukemia: Editorial Board (completed 1996)
Molecular Cancer Therapeutics (2001-present)
Molecular Oncology (2006-present)
Molecular Systems Biology: Senior Editor (2004 - present)
Public Library of Science: Biology (2003-2012)
Public Library of Science: Computational Biology (2005-2012)
Public Library of Science: Medicine (2004 - 2011)
Wiley Interdisciplinary Reviews (WIRES): Systems Biology: Editorial Board (2006 - present)
The HUGO Journal: Editor-in-Chief and Founding Editor (2009-2013)
EMBO Molecular Medicine: Editorial Board (2008-present)
Human Genetics: Editorial Board (2009-present)
JAMA Oncology: Editorial Board (2014-present)

Institutional Committees and Working Groups (at time of affiliation)

1995-1996	National Action Plan on Breast Cancer - Biological Resources Working Group
1996	Lineberger Cancer Center Advisory Committee: Clinical Cancer Program
1996	Protocol Review and Monitoring Committee, NCI
1996-1997	NIH Committee on the Recruitment and Career Development of Clinical Investigators
1996	NCI - Developmental Diagnostics Working Group, 1996
1996	NCI - Cancer Genetics Working Group, 1996
1996	NCI - Clinical Trials Working Group, 1996
1996	American ACR - Clinical Cancer Research Committee, 1996
1997	SBRS Policy Board, NIH
1997	Molecular Epidemiology Coordinating Group, NCI
1997	Chairman, NIH Committee on Extramural/Intramural Investigations in the Clinical Center
1997-2001	Co-Chair, NIH Clinical Center Advisory Council
1997-2001	NIH Clinical Research Revitalization Committee
1997-1998	NCI Breast Cancer Program Review Group
1998-2001	NIH Building 10 Revitalization Committee
1999-2001	NIH Committee to establish NIH graduate program
2001-2003	University Promotion and Tenuring Committee (National University of Singapore)
2001	President's Life Sciences Committee (National University of Singapore)
2002	National University of Singapore: Feasibility study team for the establishment of a multicampus university.

2002 Biomedical Sciences Executive Committee, A*STAR (Singapore)
2004 Member, Search Committee for Deputy President (Research & Technology, NUS)
2009 Chairman, Search Committee for the Dean, College of Sciences, Nanyang Technology University, Singapore

National and International Committees and Boards (Non-Profit, Scientific, or Governmental)

Policy Setting Boards:

2000-2001 NCI-Ireland-Northern Ireland Cancer Consortium Governing Board (Founding member)
2000 American Association for Cancer Research, Clinical Cancer Research Committee
2000-2002 American Association for Cancer Research, Board of Directors (elected)
2002-2008 American Association for Cancer Research, AACR International Affairs Committee
2002-2004 National Health Group, Clinical Research Advisory Committee (Singapore), Committee **Chairman** This committee restructured the clinical research framework for half of Singapore's health care delivery system
2003 International Genetics Federation Board of Advisors
2003-2007 Bioethics Advisory Committee (member), Singapore Advisory to the Cabinet of Singaporean Parliament
2001-2003 Genetically Modified Organisms Advisory Council (Singapore Government)
2002 Ministerial committee to revaluate Singapore's secondary school system (Ministry of Education, Singapore
2004-2005 University Autonomy, Governance, and Funding Steering Committee (Ministry of Education Singapore, member)
2004-2009 **Chairman**, Research Policy & Review Committee, National Health Group, Singapore (Management and oversight of the clinical research for half of Singapore's health care delivery system)
2005-present AACR International Affairs Committee (member)
2006 – 2008 Council Member of the Board of National Medical Research Council (NMRC), Singapore
2007-2009 International Regulome Consortium. Steering Committee (member)
2007-2010 International Cancer Genomics Consortium. Steering Committee (observer member)
2009–2013 Academy of Medical Sciences (UK), International Committee (member)
2010-2013 Global Agenda Council on Genetics, World Economic Forum (member)
2012 American Society of Human Genetics, Nominating Committee (elected)

Governing Boards:

2000-2002 American Association for Cancer Research, Board of Directors (elected)
2003-2008 National Graduate School (NUS) Governing Board.
2004 Singapore American School (SAS) Board of Governors
2006- 2008 Governing Board, National Health Group (member) NHG provides one half of Singapore's health care delivery system
2005-2008 NUS High School of Math and Sciences (Singapore), Board of Governors (Member)
2005-present NUS-Duke Graduate Medical School (Singapore), Board of Directors (Member).
2006-present Human Genome Organization (HUGO) Council (elected member)
2006 – 2007 Governing Board, Health Sciences Authority (FDA equivalent of Singapore) Deputy Chairman
2006 - 2008 AACR Nominating Committee (elected member)
2007 – 2011 **Chairman**, Governing Board Health Sciences Authority of Singapore (FDA equivalent for Singapore)

2007 - 2010 Elected, **President**, Human Genome Organization
2008 – 2010 Member of the Governing Board of National Medical Research Council (NMRC)
2008 - 2012 Board of Governors, Duke-NUS School of Medicine
2008 - 2012 Board of Trustees member, National University of Singapore
2009 - 2014 Keystone Symposia Governing Board, and Committee on Globalization**.**
2010 - 2013 Reelected, **President**, Human Genome Organization
2013-**present** Council member, Human Genome Organization
2012 - 2015 Board of Directors, Association of American Cancer Institutes
2012–**present** Board of Directors, Foundation for the National Institutes of Health
2018-**present** American Association for Cancer Research, Board of Directors (elected)
2020-**present** American Cancer Society, Board of Directors

Operational Committees for Cooperative Groups:

1993 - 1996 **Chairman**, Solid Tumor Correlative Sciences Committee;
Cancer and Leukemia Group B
My responsibilities were to organize and lead the molecular translational sciences for this national cooperative clinical trials group in oncology in solid tumors.
2015 – present Member, Soutwest Oncology Group, Translational Sciences Committee

Advisory Boards

1994 University of California at San Diego. San Diego, CA
External Advisor for the Cancer Center
1995 University of Texas at Dallas, Southwestern. Dallas, TX.
External Advisor for the Cancer Center
1995 Dartmouth University, Norris Cotton Cancer Center, New Hampshire.
External Advisor for the Cancer Center
1995 University of Colorado at Denver External Advisor for breast cancer program.
1995 City of Hope, Duarte, California External Advisor, Breast Cancer Program
1996-1999 Susan G. Komen Breast Cancer Foundation External Advisor
1998-2001 Breast Cancer Research Foundation, New York Scientific Advisory Board
1998-2000 Asian American Women's Cancer Coalition, San Francisco Advisory Board
2001 IBM, Blue Gene. External Advisory Board
2001 Moffitt Cancer Center, USF. Advisory Board 2001
2002-2005 Institute of Molecular Biology. University of Queensland (Brisbane, Australia).
Board of Scientific Advisors
2002-2007 National Center of Competence in Research (NCCR, Australia). Scientific Advisory Board.
2003-2007 Ngee Ann Polytechnic Biotechnology Advisory Board
2004 FANTOM3 working group member (Riken, Japan).
2005 – 2006 Johns Hopkins Singapore, **Chairman,** Scientific Advisory Board.
2006- 2010 American Association for Cancer Research. Scientific Advisory Council.
2007- 2018 Scientific Advisory Board Member. Finnish Institute for Molecular Medicine
2007- 2013 Keystone Symposia Scientific Advisory Board. Member
2008 –2012 Scientific Advisory Board Member, Cold Spring Harbor Laboratory Conferences Asia
2009-2013 Keystone Symposia Governing Board. Member
2009-2012 Keystone Symposia Globalization Committee. **Chairman**

2010-**present** International Advisory Board, National Institute of Biomedical Genomics. Kolkata, India
2011 World Health Organization, "Grand Challenges in Genomics for Public Health in Developing Countries"
2010-2013 Scientific Advisory Council, Archon X Prize in Genomics
2011-**present** Scientific Advisory Board, Philippines Genomic Center
2011-2015 Chinese University of Hong Kong, Scientific Advisory Committee to the Dean (HK SAR)
2012-**present** Scientific Advisory Board, Institute for Systems Genomics, University of Illinois at Champaign Urbana.
2013-2015 Board of Directors, American Association of Cancer Institutes
2013-**present** Board of Directors, Foundation for the NIH
2014-**present** External Advisory Council, Purdue University Cancer Center, West Lafayette, IN.
2016-**present** **Chairman**, Scientific Advisory Board, Sidra Medical and Research Center, Qatar
2017-**present** **Chairman**, External Advisory Board, University of Illinois Urbana Champaign Cancer Center
2018-**present** External Advisory Board, University of Arizona Cancer Center

Awards Committees:
1998-1999 General Motors Cancer Research Awards Committee: Mott Award (USA)
1999-2000 Chair, General Motors Cancer Research Awards Committee: Mott Award
2002-2006 General Motors Award, General Assembly (USA)

Consultation Activities, Membership on Company Scientific Boards

- Clontech, Inc., Palo Alto, Ca. (1987-1990) Consulted on development of Ras-mutalyzer product.
- Amgen, Corp., Thousand Oaks, CA (1991-1994) Consultant on the development of the AXL ligand as a therapeutic.
- Ciba-Corning/Chiron Consultant on Oncogene Diagnostics, 1995
- Xanathon Inc., North Carolina Scientific Board, 1997-2000
- Vysis. Scientific Advisory Board. 2001-2002
- S*Bio, Singapore. Scientific Advisory Board. 2002-2009
- Lilly Systems Biology, Pte. Lt. (Singapore) Scientific Advisory Board 2002- 2007.
- Lilly Singapore Center for Drug Discovery. Scientific Advisory Board. 2007-2010
- Veracyte, Inc. (California) Scientific Advisory Board (2008 – **present**)
- Thermo Fisher Scientific, Inc., Scientific Advisory Board (2012 – 2019)

Patents:

Publication # US5,468,634A DWPI Title: DNA encoding mammalian AXL receptor having tyrosine kinase activity useful in diagnosis and treatment of tumors (1995)
Publication # US6,015,893 Title: Oligonucleoside compounds and methods for inhibiting tumor growth, invasion and metastasis (FAK) (2000)
Publication # US6,531,296B1 DWPI Title: New Rak peptide for use for treating cancer and other neoplastic conditions or non-cancerous diseases (2003)
Publication # US 2005/0095592A1 Title: Classifying an ovarian tumor as a BRCA1 like or BRCA2 like or non-BRCA like tumor by determining a pattern of expression in the ovarian tumor of several markers (2005)

Publication # US2007/0111268A1 Title: Assessing estrogen receptor-beta function determining the level of a marker selected from CDC2, CDC6, DNA2L, CKS2, or using the level of marker as an indication of ER-beta function. (2006)
Publication # WO2010/101528A1 Title: Analyzing cell expression profile for determining metastatic cell, by measuring Jumonji domain containing- nucleic acid or polypeptide in sample of cell with normal non-cancerous cells. (2010)
Publication # WO2009/054806A1 Title: New isolated fused gene comprises first gene and fragment fused to second gene useful for diagnosing and prognosing presence and stage of tumor in a subject (2009)

Publications (refereed)

1. **Liu E**, Rubenstein M. Removal of phenytoin by plasmapheresis in a patient with thrombocytopenic purpura. Clin Phar Ther 31(6):762-765, 1982.
2. **Liu E**, Bristow MR, Stone MJ, Willerson JT. Serum Myoglobin, ionized calcium, and parathyroid function during rhabdomyolysis. Arch Intern Med 143:154-157, 1983.
3. Schneider PA, Rayner AA, Linker CA, Shuman MA, **Liu ET**, Hohn DC. The role of splenectomy in multimodality treatment of TTP. Ann Surg 202(3):318-322, 1985.
4. Connors JM, Andiman WA, Howarth CB, **Liu E,** Merigan T, Savage ME, Jacobs C. Treatment of Nasopharyngeal Carcinoma with Human Leukocyte Interferon. Journal of Clinical Oncology 3(6):813-817, 1985.
5. Cadman E, Wong D, **Liu E**. Drug resistance genes can be spontaneously transferred among mammalian cells. Progress in Clinical and Biological Research: Cancer Drug Resistance. Editor: Thomas C. Hall 223:11-20, 1986.
6. **Liu E**, Linker C, Shuman M. Management of treatment failures in TTP. American Journal of Hematology 23:347-361, 1986.
7. **Liu E**, Hjelle B, Morgan R, Hecht F, Bishop JM. Mutations of the Kirsten-ras proto-oncogene in human preleukemia. Nature 330:186-188, 1987.
8. **Liu E**, Hjelle B, Bishop JM. Transforming genes in Chronic Myelogenous Leukemia. Proc. Natl. Acad. Sci. USA 85:1952-1956, 1988.
9. Hjelle B, **Liu E**, Bishop JM. The Oncogene v-src transforms and establishes embryonic rodent fibroblasts but not diploid human fibroblasts. Proc. Natl. Acad. Sci. USA 85:4355-4359, 1988.
10. **Liu E,** Dollbaum C, Scott G, Rochlitz C, Benz C, Smith H. Molecular lesions involved in the progression of human breast cancer. Oncogene 3:323-327, 1988.
11. Santos G, Lee B, **Liu E**, Benz C. Modulation of endogenous c-myc levels in a human mammary carcinoma cell line after estrogen stimulation. J. Biol. Chem. 263: 9565-9568, l988.
12. Wong D, **Liu E**, Cadman E. The enhanced transfer of drug resistance genes in NIH 3T3 cells transformed by the EJras oncogene. Yale J. Biol. Med. 61(1):1-10, l988.
13. Chen L, O'Bryan J, Smith HS, **Liu E**. Isolation of a Matrix Gla Protein in breast carcinoma cells by differential cDNA cloning. Oncogene 5(9):1391-1396, 1990.
14. **Liu E,** Santos G, Osborne K, Lee B, Benz C. Overexpression of the c-myc proto-oncogene reduces the growth rate of MCF-7 cells. Oncogene 4: 979-984, l989.

15. Rochlitz CF, Scott GK, Dodson J, **Liu E**, Dollbaum C, Smith HS, and Benz CC. Activating mutations in ras oncogenes associated with primary and metastatic human breast cancer. Cancer Research 49:357-360, l989.

16. Nelson P, Frye RA, **Liu E**. Bifunctional oligonucleotides synthesized using a novel MF-CPG support can detect single base substitutions in genomic DNA. Nucl Acid Res 17(18):7187-7194, l989.

17. Frye RA, Benz CC, **Liu E**. Detection of amplified oncogenes in breast carcinoma using differential polymerase chain reaction. Oncogene 4:1153-1157, l989.

18. Cogswell P, Morgan R, Dunn M, Neubauer A, Poland-Johnston NK, Nelson P, Sandberg AA, **Liu E**. Mutations of the ras protooncogenes in chronic myelogenous leukemia: a high incidence of ras mutations in bcr/abl rearrangement negative chronic myelogenous leukemia. Blood 74(8):2629-2633, l989.

19. Ball ED, Mills LE, Neubauer A, **Liu E**. Detection of minimal acute myeloid leukemia cells in bone marrow by probing for mutated ras oncogenes using the polymerase chain reaction and oligomeric DNA probes. Progress in Clinical and Biological Research, 333:499-506, l990.

20. Neubauer A, Neubauer B, **Liu E**. A polymerase chain reaction based assay to detect allelic loss in human DNA: loss of the beta-interferon gene in chronic myelogenous leukemia. Nucl Acid Res. 18:993-998, l990.

21. Neubauer A, Shannon K, **Liu E**. Mutations of the ras prot-oncogenes in childhood monosomy 7. Blood 77(3):594-598, 1991.

22. Chen LC, Neubauer A, Kurisu W, Walfman F, Ljung B, Goodson W, Goldman E, Moore D, Balazs M., **Liu E**, Mayall B, Smith HS. Loss of heterozygosity on the short arm of chromosome 17 is associated with high proliferative capacity and DNA aneuploidy in primary human breast cancer. Proc. Natl. Acad. Sci. (USA) 88:3847-3851, 1991.

23. O'Bryan J, Frye RA, Cogswell P, Kitch B, Neubauer A, Espinosa R, LeBeau M, Prokop C, Earp HS, **Liu E**. axl, a transforming gene isolated from primary human myeloid leukemia cells, encodes a novel receptor tyrosine kinase. Mol Cell Biol. 11:5016-5031, 1991.

24. Smith HS, Stern R, **Liu E**, Benz CC. Early and late events in the development of breast cancer. In Boundaries between Promotion and Progression during Carcinogenesis. Ed. Sudilovsky O., et al. Plenum Press, New York, pp. 329-340, 1991.

25. **Liu ET**, Sandler D, Neubauer A, Taylor J, Dodge R, Shore D, Ball E, McIntyre R, Bloomfield CD. Clinical and etiologic importance of mutant ras genes in adult acute myeloid leukemia (AML). Blood 78(10), Suppl1:1340, 1991.

26. Effert P, Neubauer A, Walther PJ, **Liu E**. Alterations of the p53 gene is involved in the progression of human prostate carcinomas. J.of Urology 147:789-793, 1992.

27. Neubauer A, He Mei, Neubauer B, Effert P, Iglehart D, **Liu E**. Differential Polymerase Chain Reaction in the Analysis of Archival Tissues. Oncogene 7:1019-1025, 1992.

28. **Liu E**, He M, Barcos M, Thor A, Benz CC. High frequency of HER-2/neu amplification in in situ carcinoma of the breast: Analysis using differential polymerase chain reaction. Oncogene 7: 1027-1032, 1992.

29. Taylor JA, Li Yu, You M, Wilcox AJ, **Liu ET**. B Region Variant of the Estrogen Receptor Gene. Nucl. Acids. Res. 20:2895, 1992.

30. Weiner J, Effert P, **Liu E**, Walther P. Human papilloma virus in penile carcinoma: analysis of archival tissues by differential polymerase chain reaction. Int. J. Cancer 50: 694-701, 1992.

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339. Terry Kaan and Edison T Liu (editors). Life Sciences: Law and Ethics - Recent Developments in Singapore. Singapore Academy of Law (Academy Publishing) 2007

340. Liu ET, Lauffenberger DA. Systems Biomedicine: Concepts and Perspectives. Elsevier and Academic Press. 2009 (Chinese Edition 2011)

Chapter 1: Foundations for Systems Biomedicine: an Introduction. *Edison T. Liu*

Chapter 2: Genomic Technologies for Systems Biology. *Edison T. Liu, Sanket Goel, Kartiki Desai, and Mathijs Voorhoeve*

Chapter 4: Cellular Regulatory Networks: *Brian A. Joughin , Edwin Cheung , R. Krishna Murthy, Karuturi , Julio Saez-Rodriguez , Douglas A. Lauffenburger and Edison T. Liu*

Chapter 16: Systems Pharmacology in Cancer. *Qiang Yu and Edison T. Liu*

Chapter 18: Quantitative Biology and Clinical Trials: a Perspective. *Robert A. Harrington and Edison T. Liu*

Non-Science publications:

- "Testing for the virus: Hopes - and realities." Edison Liu and Ai Ee Ling April 16, 2003. Straits Times, Singapore. Article explaining the development of diagnostics for SARS
- "Small Singapore has much to be proud of". Edison Liu. August 5, 2003. Straits Times, Singapore. Op Ed piece
- "Crime and Punishment?" Edison Liu. September 30, 2003. Straits Times, Singapore. Op Ed piece.
- "Can it happen in Singapore?" Edison Liu. December 30, 2005. Straits Times, Singapore. Op Ed on Suk Woo Hwang
- "The world is beginning to look like Singapore." Edison T. Liu . March 2005. Straits Times, Singapore. Op Ed on Singapore's national culture
- "Going Forward In Stem Cell Research". Edison T Liu and Ng Huck Hui . December 10, 2008. Straits Times, Singapore. Informational article on stem cell research for the national newspaper.
- "Bioethics, clinical research, and patient information." Edison Liu June 2006. Straits Times, Singapore (national newspaper). Informational article on bioethics for the public.
- "This is the most exciting place to do science" Edison Liu. March 11, 2007. Straits Times, Singapore (national newspaper). Op Ed on biological sciences in Singapore.
- "Why Setting the Right Rules for Health Care Products is Critical". Edison Liu & John C. Lim. September 1, 2007. Straits Times, Singapore (national newspaper). Article on health regulation in Singapore.
- BioColumn: "What is next in biotechnology?" Edison T. Liu. March-April 2007. Biospectrum (Biotechnology industry journal)
- BioColumn: "Social arbitrage**"** Edison T Liu. April 2007. Biospectrum (Biotechnology industry journal).
- BioColumn: "Combinatorial drug therapy and systems biology". Edison T Liu. July-August 2007. Biospectrum (Biotechnology industry journal)

- BioColumn: “Sequencing of Individual Genomes”. Edison T Liu & Sharon CC Chiang. September 2007. Biospectrum (Biotechnology industry journal)
- BioColumn: ”Ecology for Success in the Biomedical Sector”. Edison T Liu. November 2007. Biospectrum (Biotechnology industry journal)
- BioColumn: ”Innovative Regulator: the Health Sciences Authority of Singapore”. Edison T Liu. January 2008. Biospectrum (Biotechnology industry journal)
- BioColumn: “Changing national health outcomes, telecommunications in medicine” Edison T. Liu. March 2008. Biospectrum (Biotechnology industry journal).
- BioColumn: “Contribute to the future of medicine” Edison T. Liu. April 2008. Biospectrum (Biotechnology industry journal).
- BioColumn: “What is wrong with Asian biotech” Edison T. Liu. June 2008. Biospectrum (Biotechnology industry journal).
- Book Review “The Language of Life: DNA and the Revolution in Personalized Medicine” by Francis S. Collins Harper, 2010. Reviewed by Edison T Liu. Nature Medicine. 16 (1):24 (2010)
- “Covid-19, Science and Politics”, Edison Liu. November 23, 2020. The Straits Times, Singapore.

Trainees: (year of completion, year of follow-up)

Post-doctoral Fellows:

Roy A. Frye, M.D., Ph.D. (1991)
(ACS Career Development Award)
Current Position (1997): Assist. Prof.
University of Pittsburgh

Andreas Neubauer, M.D. (1990)
(Deutsche Forschungsgemeinschaft)
Current Position (2010): Chief
Hematology,
University of Marburg, Germany

Peter Effert, M.D. (1991)
(Deutsche Forschungsgemeinschaft)
Current Position (1995): Assistenzartz,
Heinrich Heine Universitat,
Dusseldorf, Germany.

Eleni Levedakou, Ph.D. (1993)
(Susan Komen Foundation Fellowship)
Current Position (2006): Research
Scientist,
Department of Neurology, University of Chicago

Gwen Spizz, Ph.D. (1994)
(Cancer Center Training Grant)
Current Position (1996): Research
Associate,
Howard Hughes Medical Institute,
Duke University Medical Center, N.C.

Man Chang, Ph.D. (1995)
(Cancer Center Training Grant)
Current Position (1996): Post-doctoral
fellow
Wayne State University, MI.

Yu Li, M.D. Ph.D. (1996)
Current Position (2007): Assistant Professor
Pathology, University of Virginia Charlottesville

Wendall Yarbrough, M.D. (1996)
(K08 Award, UNC Chapel Hill)
Current Position (2015):
Professor and Chief Otolarnygology, Yale University

William Cance III, M.D. (1996)
(K08 Award, UNC Chapel Hill)
Current Position (2009): Chief, Department of Surgery,
Roswell Park Cancer Institute, New York .

Yih-Woei Fridell, Ph.D. (2000)
(Senior Staff Fellow, NCI)
Current Position (2004):
Assistant Professor, University of Conn.
(CT).

Qinbin Guo, Ph.D. (2000)
(Senior Staff Fellow, NCI)
Current Position (2008):
Program Director, National Institute of Ageing
NIH, Bethesda, MD

Lisa Gangi, Ph.D. (2000)
(Senior Staff Fellow, NCI)
Current Position (2002):
Director, Microarray Facility
NCI, Frederick (MD)

Jacy Villa, M.D. (2000)
(Senior Staff Fellow, NCI)
Current Position (2000):

Private Practice Oncology, Florida

Bruno Fang, M.D. (2000)
(Senior Staff Fellow, NCI)
Current Position (2000):
Private Practice Oncology, New Jersey

Qiang Yu, Ph.D. (2002)
Current Position (2010)
Group Leader, Genome Institute of Singapore

Olga Aprelikova, Ph.D. (2002)
Current Position (2010)
Staff Scientist, NCI, NIH

Ting Qui, Ph.D.
Current Position (2010)
Staff Scientist, NCI, NIH

Chandramouli Gadesetti, Ph.D. (2002)
Current Position (2006)
Research Scientist, NCI (USA)

Amir Jazaeri, M.D. (2002: NCI-SGO Fellowship)
Current Position (2010)
Assistant Professor, Obstetrics & Gynecology
University of Virginia at Charlottesville

Mei He, M.D. (2002)
Current Position (2016)
Staff Scientist, NCI, NIH

Chin Yo LIN, Ph.D (2005)
Current Position:
Assistant Professor
University of Houston (2010)

Roy Joseph, Ph.D. (2008)
Current Position:
Senior Scientist, Lilly Singapore Center for Drug Development
(2009)

Sabry Mohammed Hamza, Ph.D. (2009)
Current Position:
Group Leader, Schering Plough Research Institute
(2009)

Francesca Menghi, Ph.D. (2011)

Current Position:
Research Scientist, The Jackson Laboratory (2018)

Xing Yi Woo, Ph.D. (2012)
Current Position:
Consultant Computational Scientist, The Jackson Laboratory

Koichiro Inaki, Ph.D. (2013)
Current Position:
Senior Scientist, Functional Genomics and Proteomics Research Group, Discovery Science and Technology Department, Daiichi Sankyo RD. Japan (2015)

Joel Wagner, Ph.D. (2015)
American Cancer Society Fellow
Current Position:
Senior Computational Scientist, Novartis Oncology (2015)

Pooja Kumar, Ph.D. (2020)
Current Position: Associate Research Scientist,
The Jackson Laboratory

Richa Singh, Ph.D. (2018)

Mayuko Furuta, Ph.D. (2020)
Jackson Laboratory Scholar
Current Position: Associate Research Scientist,
The Jackson Laboratory

Graduate Students:

Barry Kitch (Medicine, 1992)
(N.I.H. Medical Student Preceptor Program)
Current Position (2007): Assistant Professor,
Brigham and Women's Hospital, Center For Chest Diseases

John O'Bryan (Ph.D., Genetics, 1992)
(Howard Hughes Predoctoral Fellowship)
Current Position (2016):
Associate Professor, University of Illinois, Chicago

Koon Siew Lai (Ph.D., Biology, 1996)
Current Position (1999):
Assistant Professor, Johns Hopkins University/National University of Singapore, Clinical Pathology Program.

Patrick McCloskey, (Ph.D. Genetics, 1996)
Current Position (2007):

Assistant Director, Office of Corporate Liaison and Technology Development, Rutgers University

Eyal Attar, (M.D. UNC Chapel Hill. Howard Hughes Medical Fellowship, 1996)
Current Position (2007):
Assistant Professor, Medicine, Mass General Hospital. Boston, MA.

Rolf Craven, (Ph.D. Genetics, 1995; USARMC Breast Cancer pre-doctoral fellow)
Current Position (2006):
Assistant Professor, Molecular and Biomedical Pharmacology, University of Kentucky

Carol Carter, (Ph.D. Genetics, 2001)
Current Position (2003):
Post Doctoral Fellow, NCI

Subashini Chandrasekaran (Ph.D., Genetics, 2001)
Current Position (2010)
Staff Fellow, Duke University

Lance Miller, (Ph.D. Genetics 2001)
Current Position (2015) Associate Professor, Cancer Biology, Wake Forest University Medical School

Bangarusamy Dhinoth Kumar (Ph.D. Biochemistry, 2008). Current Position: Assistant Professor, King Abdullah University of Science and Technology. Saudi Arabia.

Yew Kok LEE (Ph.D. National Graduate School for Integrative Sciences, NUS; 2009). Current Position (2014) computational biologist, National University of Singapore

Tze Howe CHARN. (Ph.D. University of Illinois Champaign Urbana; 2010). Current Position (2016) Senior Scientist Fluidigm, California

Wendy SOON. (Ph.D. National University of Singapore; 2010). Current position (2016) Director, Sequencing Facility, Genome Institute of Singapore

Yi Fang LEE (Ph.D. Nanyang Technology University 2011). Current Position: Senior Scientist, ClearBridge Biomedics, Singapore (2016)

Say Li KONG (Ph.D. National University of Singapore 2012). Current Position: Post-doctoral position with Dr. Bing Lim, Genome Institute of Singapore (2014)

Gaye Saginc (Ph.D., National University of Singapore, 2015). Current Position: Post-doctoral Fellow with Dr. Rune Linding, Copenhagen (2016).

Faranak Ghazi Sherbaf (Ph.D. Post-Doctoral fellow, National University of Singapore; 2016)

Research Grants:

Current Research Support:

2 P30 CA034196-34, Liu (PI) 04/01/20 – 03/28/25
NIH/NCI
Cancer Center Support (Core) Grant
The objective of this grant is to support cancer research at The Jackson Laboratory. This has been a continuously funded grants since 1983. Our impact score at the renewal in 2019 was 20 with an Outstanding descriptor.
The Jackson Laboratory Cancer Center provides a unique concentration of genetic and genomic expertise focusing on applications of murine model systems and systems genomics in addressing cancer questions.
Role: Principal Investigator

19-036-ASP
Mark Foundation Cancer Fund Liu (PI) 11/01/19-04/30/22
Dissecting the Genetic Control of Response to Immune Checkpoint Inhibitors in Cancer
This grant is to assess the effect of host genetics on immune-oncology agent efficacy using genetically diverse mice.
Role: Principal Investigator

1R01CA255705-01 Liu (PI) 12/01/20-11/30/25
NCI/NIH
Genomic Biology of the Tandem Duplicator Phenotype in Mouse and Human Cancers
This grant supports our work on determining the origins and evolution of models of breast cancer with the tandem duplicator phenotype.
Role: Principal Investigator

ALFOND-FY20ETL, Liu (PI)
10/1/2020 - 9/30/2025
Harold Alfond Foundation
Maine Cancer Genomics Initiative 2.0
The goal of this project is to provide cancer genomics diagnostics to approximately 3200 Maine patients over 5 years.
Role: Principal Investigator

Completed Research Support:

BC160172P1 Liu (PI) Scully (co-PI) 03/01/17-02/29/21
DoD Breast Cancer Research Program, Breakthrough Award
This grant supports the investigation of the tandem duplicator phenotype as a new chromotype in triple negative breast cancer with sensitivity to cisplatin.
Role: Co-Principal Investigator

1 U10 CA180944-01 Baker, Liu, Tuveson (PI) 06/12/14-02/28/19
NIH/NCI
SWOG Network Group Integrated Translational Science Center
The Jackson Laboratory (JAX) is a full partner in the National Clinical Trials Network Group Integrated Translational Science Center. Dr. Liu will work collaboratively with the co-PIs of this project as well as leaders and members of the Network Group and NCI program officials to promote translational research at JAX and integrate the outcomes of translational pilots into late phase clinical trials. Together with the co-PIs, JAX faculty and staff will organize an annual meeting at JAX for Network group members to educate basic, translational and clinical researchers about key clinical challenges and translational research opportunities to address them.
Role: Principal Investigator

51006091 Liu (PI) 09/01/07-08/31/13
Howard Hughes Medical Institute
Precollege Science Education Initiative for Biomedical Research Institutes
The major goal of this project is to grow and diversify mentorship program participation by high school students and science teachers.
Role: Principal Investigator

MTAF2012 Liu (PI) 07/01/12-12/31/12
Maine Technology Institute
Maine Regional Flow Cytometry Consortium (MRFCC)
Role: Principal Investigator

MBRB2012 Liu (PI) 03/05/12-06/30/12
Maine Technology Institute
Expanding JAX Sequencing and Data Analysis Pipelines Beyond Mouse
Role: Principal Investigator

RFA-CA-07-001 Liu (PI) 05/15/07-05/14/10
NIH/NCI
Pair-end-ditag technologies for the complete annotation of fusion genes
This grant is to develop pair-end-tagging technologies for the discovery of functional translocations in cancer.
Role: Principal Investigator

R01 HG003521-01 (ENCODE) Ruan (PI) 09/01/04 – 06/30/07
Ditag technologies for complete transcriptome annotation
National Institutes of Health
This grant is to develop new technologies for transcriptome annotation.
Role: Co-Investigator

Susan G Komen Foundation Hall (PI) 06/01/04 – 05/31/06
Genetic and environmental determinants of postmenopausal breast cancer.
Role: Co-Principal Investigator

FP6-2004-LIFESCIHEALTH-5 (CRESCENDO) 10/01/04 – 09/30/09
Consortium for Research into Nuclear Receptors in Development and Aging
European Commission
Role: Partner and co-Principal Investigator

CA-98-013 Green (PI) 10/1999-09/2002
NIH/NCI
Mouse Model for Human Cancer Consortium: NCI Mammary Mouse Collective
The NCI Mouse Mammary Collective is one of 19 members of a national consortium to construct and to study mouse models for human cancers
Role: Co-Principal Investigator

1 U01 CA88175-01 Boyd (PI) 09/2000-09/2004
NIH/NCI
NCI Director's Challenge Grants: Expression analysis of ovarian cancers
This project is to determine whether the array profiles from the GOG ovarian tumor bank can be correlated with clinical outcome.
Role: Co-Principal Investigator

Leukemia Research:

RO1 CA49240-06 Liu (PI) 07/01/96-06/30/00
NIH/NCI
Biology of the AXL Receptor Tyrosine Kinase in Breast Cancer
This project examines the role of axl, a receptor tyrosine kinases, in human breast cancer.
Role: Principal Investigator

Leukemia Society Scholars Award Liu (PI) 12/31/91-12/30/96
Molecular Genetics of Leukemogenesis
This project examines the molecular lesions involved in human leukemogenesis.
Role: Principal Investigator

Breast Cancer Research:

5 U10 CA37027-11 Liu (PI) 05/01/93-04/31/98
NIH/NCI
Cancer and Leukemia Group B
This grant is to identify the ligand for the axl oncogene
Role: Principal Investigator

P50 CA58223-03 Liu (PI) 10/01/92-09/30/00
NIH
Specialized Program of Research Excellence (SPORE) in Breast Cancer
This is one of six SPOREs awarded for the comprehensive study of breast cancer.
Role: Principal Investigator

1 U01 CA64061-01 Liu (PI) 06/01/94-06/30/99
NIH

HER-2 Oncogene and Response to Dose Intensive Therapy.
This grant is to study the interaction between HER-2 overexpression and amplification and dose intensive adjuvant chemotherapy.
Role: Principal Investigator

Pagano (PI) 06/01/94-05/31/99
NIH/NCI
Cancer Center Core Support Grant - Program Leader in Breast Cancer
Provides salary support as program leader in breast cancer research for the Cancer Center.
Role: Program Leader

Liu (PI) 08/01/96-07/31/00
USARMC/DOD
Protein Kinases in Breast Cancer
This grant is to study two kinases rak and cdk7 in breast cancer biology.
Role: Principal Investigator

Molecular Epidemiology:

RFP. N01-ES-15327 Liu (PI) 09/30/91-09/29/96
NIH/NIEHS
Oncogene Analysis for Epidemiologic Studies
This contract is to study the role of oncogene mutations in the cancer epidemiology of bladder and lung cancer.
Role: Principal Investigator