CURRICULUM VITAE

Janurary 2025

Christopher J. Paige, PhD FCAHS

PRESENT POSITIONS

Senior Scientist, Princess Margaret Cancer Center
University Health Network[1], Toronto, Canada

Professor, Departments of Medical Biophysics and Immunology, University of Toronto

Director General, UHN Shanghai

ADDRESS

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DEGREES

1979: PhD
Sloan-Kettering Division
Cornell University
New York, USA

ACADEMIC APPOITMENTS

1997 – 2016	Vice President, Research University Health Network[1] Toronto, Canada Ronald Buick Chair in Cancer Research
1997 – Present	Senior Scientist, Princess Margaret Cancer Centre Toronto, Canada
1991 – Present	Professor, Departments of Medical Biophysics and Immunology University of Toronto Toronto, Canada
1991 – 1997	Director, The Wellesley Hospital Research Institute Toronto, Canada
1987 – 1991	Associate Professor, Departments of Medical Biophysics and Immunology University of Toronto Toronto, Canada
1987 – 1990	Senior Scientist, Ontario Cancer Institute Toronto, Canada
1980 – 1987	Member, Basel Institute for Immunology Basel, Switzerland
1974 – 1979	Pre-doctoral Fellow, Sloan-Kettering Division Cornell University New York, USA

1. The University Health Network is Canada's largest Research Hospital comprised of 4 hospitals and 6 research institutes with a combined research expenditure of > $550M, >6000 staff (1200 Prinipal Investigators), and >2000 trainees. The UHN is affiliated with the University of Toronto. The VP, Research reports to the UHN CEO and is responsible for all aspects of

University Health Network

Toronto General Hospital Toronto Western Hospital Princess Margaret Hospital

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Statement for IUIS

I am pleased to be nominated for a position on the IUIS executive committee. My personal philosophy, supported by many years of action, fits well with the stated Objectives of the IUIS: 1) commitment to co-operation; 2) international education, and 3) advancement of immunological science. My personal research program has been marked by a series of essential collaborations spanning from basic research to clinical trials. I co-founded the Terry Fox Research Institute to link cancer research program across Canada and which now has more than 100 partner sites. As head of research at the University Health Network in Toronto, I created a collaborative leadership model that combined clinical and basic researchers and established the infrastructure for strong trainee programs. I also established a commercialization office that helps bring research discoveries to patients and have personally been active in biotechnology development. Having undertaken research in Canada, Switzerland, USA and China I am committed to international cooperation and education. Attending 14 of the 15 IUIS conferences since Paris (1980), I have seen first-hand the critical role that the IUIS plays not only in the advancement of the science of immunology but also in promoting public awareness of the importance of immunology.

My ability to carry out the specific role of Treasurer comes from years of experience as Vice-President, Research at Canada's largest research hospital where I was responsible for the administration of a research budget that exceeded $350M, as well as membership on the Finance Committees of several private sector companies.

research.

ACADEMIC ACTIVITIES

Graduate Student Degree supervision (1987-Present)
PhD Program - 18
MSc Program - 4
Postdoctoral Fellows -20
Student Committees – 30

I currently lecture on B cell development in courses offered in the Department of Immunology, University of Toronto, in graduate and 4th year undergraduate programs. I provide the introductory lecture in immunotherapy offered by the Departments of Medical Biophysics and Immunology, University of Toronto.

As Vice-President, Research at UHN I established the Office of Research Trainees (ORT) to support the needs of the more than 2000 trainees (students and postdocs) at UHN.

RESEARCH GRANTS: Principle Investigator (1987-present (CAD))

Canadian Institutes of Health Research $3.1M
CIHR/NCE, BioCanRx Clinical Trial Program $488K
Leukemia & Lymphoma Society of Canada $333K
National Cancer Institute $1.5M
Terry Fox Foundation $19.7M
Private Sector Collaboration $540K
Krembil Foundation/TG&WF $1.4M
Ontario Ministry of Research and Innovation: $530K
PM Foundation: $3.1M
Candadian Foundation for Innovation: $230M

Current funding
BioCanRx (CIHR/NCE) : Phase I Study of Autologous Acute Myelogenous Leukemia (AML)Cells Containing Lentivirus Engineering Expression of IL-12 (NCT02483312). Krembil Foundation, Beamish Foundation: Cytokine based development of therapeutic vaccines for cancer. ($650K CAD)

RESEARCH CONTRIBUTIONS TO IMMUNOLOGY

1. Developed experimental models for testing the ability of cytokines to induce anticancer immune responses using autologous cancer cells engineered to secrete selected cytokines using a lentivirus vector. Experiments using IL-12, IL-15, IL-21, and IL-18 have all proven effective although different, sometimes complementary, immune pathways have been induced. These experiments provide the rationale for a Phase 1 clinical trial using AML cells expressing IL-12 (NCT02483312) which is enrolling patients at Princess Margaret Cancer Centre.

Key publications: J. Immunol. 176(9):5354, 2006; J. Cell Mol Med. 17(11):1465-1474 2013; Cancer Immunol. Res. 2(11):1113-1124, 2014; OncoImmunology. 4(3), 2915;. Mol Ther Methods Clin Dev. 3:160742, 2016; J ImmunoTherapy of Cancer, 19:355. 2019; Can. Immunol. Immunother. 72:2597, 2023

2. Cloned and characterized Hemokinin-1, the first member of the mammalian tachykinins that is not a neurokinin and is predominantly made by bone marrow cells. Since our original publication on the mouse gene, an entire field of “endokinins” has developed with HK-1 genes in humans, rabbits, and other species yielding a large number of novel peptides. For nearly 50 years the field of neurokinins has been dominated by the concept that the relevant peptides were made by the central nervous system. The many observations that activities of “neruokinins” are observed in diverse sites were attributed to the innervation of these sites. The growing alternative view is that these activities are likely due to the newly discovered set of bioactive peptides, which are made by a diversity of non-neuronal cells.

Key publications: Nat. Immunol. 1:392., 2001; Blood, 15:2165, 2003; J. Neuroimmunol. 164(1-2):48, 2005; J. Neuroimmunol. 187:83, 2007; PLoS One 8(3), 2013; Peptides. 64,1 2015; Brain Behav. Immuno 59:219, 2017

3. Discovered that IL-7 and the preBcR act in consort to provide the molecular mechanism for positive selection during the proB to preB transition. Developing B cells undergo a tremendous proliferative burst early in their development but, given that the process for rearrangement and assembly of the B cell receptor is error prone, mechanisms to eliminate unsuccessful cells are critical. Our system shows that IL-7 responsive B cell progenitors are able to thrive in low amounts of IL-7 only if they possess a functional pre BcR. The development of a bank of IL-7 dependent preB cell lines, now widely distributed, proved useful for understanding the molecular control of IL-7 responsiveness.

Key publications: J. Immunol. 160:5886, 1998; Immunity15:512, 2001; J. Immunol. 180:2839, 2008. J. Immunol. 187: 3499, 2011

4. Developed the assays that allowed single cells to develop from multipotential progenitors to Ig secreting B cells, identifying new intermediates along the way. Our early work established at the single cell level, that stromal elements are required for this progression, ultimately leading to the discovery that three specific factors are sufficient to replace the stromal contributions. The identification of bi potential B-macrophage cells provided a framework for differentiation studies that others have used to show how cell fate could be influenced by different levels of specified gene products.

Key publications: Nature 302:711, 1982; EMBO J 5:3475, 1986; J. Exp. Med. 167:1499, 1988; Nature 356:612, 1992; PNAS 906429,1993; Immunity 15:521-531, 2001.

5. Established 70Z/3 as a model for B cell development and used it to help determine that the Immunoglobulin heavy and light chains are independently regulated. This cell line has now been used by numerous investigators for more than 30 years. 70Z/3 was the first example of a cell line in the B lineage that could be induced to take a differentiation step, namely the induction of surface Ig by LPS, and proved very useful for early studies of immunoglobulin biochemistry and assembly. It has also served the community well as an excellent source for gene cloning and is now used as a model of apoptosis, and tumour formation. We have recently used this cell line to develop a new model of immune recognition of ALL. Using 70Z/3 cells transduced with a lentivirus vector expressing IL-12, we developed syngenic cell based vaccine protocol that serves as a basis for establishing human trials.

Key publications: J. Immunol. 121:641, 1978; Science 209:1366,1980; Nature 292:631, 1981; J. Immunol. 176:5354, 2006; J. Cell Mol. Med. (8B):1962-76, 2009; Cancer Immunol. Res. 2(11):1113, 2014.

Total peer-reviewed research publications: 157
Patents: US Patent 8,765,462 B2 2014 Medin JA, Paige CJ IL-12 immunotherapy for cancer PCT/CA2021/050711 Paige CJ Combination Cytokines for Methods and Compositions for Treating Cancer US63/775,237 Paige CJ, Berger A, D'Souza CA, Furlonger CL. IL-12 expressing cells for cancer therapy

BOARDS / ADVISORY COMMITTEES

Hospital Related

1991 – 1997	Chair, Wellesley Hospital Research Advisory Committee
1991 – 2016	Hospital / University Research Coordination Committee
1998 – 2016	Member, Board of Directors, The Princess Margaret Cancer Foundation
1998 – 2016	Member, Board of Directors, Toronto General & Western Hospital Foundation
1998 – 2016	Member, Board of Directors, Arthritis Research Foundation
2001 – 2016	Toronto Academic Health Science Network (TAHSN) Research Committee
2002 – 2006	Co-Director, Council of Ontario Research Directors (CORD)
2000 – 2016	Member, Board of Directors, Ontario Health Research Alliance
2000 – 2006	Member, Canadian Health Research Council

2009 – 2016 Member, Research Committee of the Board of Trustees, University Health Network

Agencies
1994 – 1997 Research Advisory Committee,The Arthritis Society
1995 – 2001 Advisory Committee on Research (ACOR), NCI (Canada)
2013 – 2016 Member, Board of Directors, Research Canada

Institutes
2007 – present Member, (Chair 2019-2025) Board of Directors, Terry Fox Research Institute (TFRI)
2005–2010/2014-2016 Member, Board of Directors, Ontario Institute for Cancer Research (OICR)
2005 – 2010 Founder, Co-Director, Shanghai-Toronto Institute for Health Science (STI)

Private Sector Companies
1996 – 2016 Founder and Board Chair, Gemma Biotechnology
2002 – 2003 Member, Board of Directors, Transplantation Technologies Inc.
2006 – present Director General, UHN Shanghai (WOFE)
2011 – present Member, Board of Directors, Atuka Inc.
2014 – 2016 Member, Board of Directors, Medlantis Inc
2021- 2024 Member, Scientific Advisory Board, ITabMed, Shanghai
2022 – 2024 Member, Scientific Advisory Board, China Immunotech, Beijing

Public Companies
2016 – 2023 Scientific Founder, Member, Board of Directors, AvroBio Inc (Nasdaq listed; now merged as Tectonic)

Not for Profit Companies
2002 – 2006 Member, Board of Directors, CANVAC (Canadian Vaccine Network)
2004 – 2010 Chairman, Board of Directors, BioDiscovery Toronto
2011 – present Member, Board of Directors, Ctr for Commercialization in Regenerative Medicine
2020 – present Member, Board of Directors, Tafelmusik Baroque Orchestra and Choir

INVITED LECTURES (selected)

Cytokines in translational research
3rd Asia Pacific Meeting of the Association of Academic Health Centers International, Shanghai, China, October 2012

Interleukin 12: Conductor of an anti-cancer quartet
University of Sao Paulo, Sao Paulo, Brazil, April 2013

Interleukin 12: Conductor of an anti-cancer quartet
American Association Immunologist/Canadian Society for Immunology, Honolulu, Hawaii, May 2013

IL-12 conducts an anti-cancer cellular quartet, reflections from mouse and man
Instituto Toscano Tumori, Florence, Italy, August 2013

B cell development in the gut
Institut Pasteur, Paris, France, November 2014

Induction of CD4+ cytotoxic lymphocytes in experimental cancer models
9th Federation of African Immunological Society Conference, Nairobi, Kenya, December 2014

IL-12 Trial: Phase 1 study of autologous acute myelogenous leukemia (AML) cells containing lentivirus engineering expression of IL-12. CCRU Education Day, Toronto, Ontario, December 2015

Oncology R&D capabilities in Ontario

South Korean R&D Hospital Delegation, Embassy of Canada in Seoul, Toronto, Ontario, June 2016

Cytokines and anti-cancer strategies
B Cell Immunology, Erlangen, Germany, July 2016

Anti IL-12 vaccine therapy in CLL
Canadian National CLL Meeting, Winnipeg, Manitoba, September 2016

Harnessing the power of cytokines in anti-cancer therapy
A.C.Camergo Cancer Centre, Sao Paulo, Brazil April 2017

Building ecosystems for research impact.
Basel, Switzerland, November 2017

IL-12 Trial: Phase 1 study of autologous acute myelogenous leukemia (AML) cells containing lentivirus engineering expression of IL-12.
Montreal, December 2017

Cytokine based anti-cancer whole cell vaccines
Rome, Italy December 2018

Cytokine based anti-cancer whole cell vaccines
Munich, Germany June 2019

Gut associated B cells. Induction of IgA
Rome, Italy, July 2019

Cytokine based anti-cancer whole cell vaccines
Vienna, Austria, August 2019

Stromal cell control of B cell development
Erlangen, Germany, September, 2022

Cytokine driven adaptive immunity to cancer- early responses.
Erlangen, Germany, September, 2024

Engineering cytokines to induce anti-cancer immunity
Jinzhou, China, October, 2024