



CURRICULUM VITAE

Josef Martin Penninger

Office Address

IMBA, Institute of Molecular Biotechnology of the Austrian Academy of Sciences, Dr. Bohrgasse 3-5, 1030 Vienna;
Tel: 43-1-79044 ext 4700; fax: 43-1-79044 4701
E-mail:Josef.penninger@imba.oeaw.ac.at

Date and Place of Birth

September 5, 1964; Gurten, Austria

Nationality

Austrian

Current Position

Scientific Director, IMBA, Institute for Molecular Biotechnology of the Austrian Academy of Sciences, Vienna. Austria

Education

- 1970-1974 Primary School, Gurten, Austria
- 1974-1982 Humanistic Gymnasium in Ried i. I., Boarding School, Austria
- 1982-1988 University of Innsbruck, Medical School, Austria
- 1985-1990 University of Innsbruck, History of Arts and Spanish
- 1986-1990 Doctoral Thesis in Immunology: "Phenotypical and functional analysis of intra-thymic nurse (TNC)-lymphocytes." Institute for General and Experimental Pathology (Prof. Dr. G. Wick), University of Innsbruck, Medical School.
- 1987-1989 Teaching Assistant, University of Innsbruck
- 1990 Graduation from Medical School, University of Innsbruck, Austria.
- 2008 Leadership course, Harvard Kennedy School of Government, Boston, USA

Postgraduate training and employment history

- 1990-1994 Postdoctoral fellow. The Ontario Cancer Institute, Princess Margaret Hospital.
- 1994-2002 Principal Investigator, Amgen Institute, 620 University Avenue, Toronto
- 1994-2003 Associate Scientist, The Ontario Cancer Institute, Dept. of Molecular and Cellular Biology, Princess Margaret Hospital, Toronto
- 1994-1999 Assistant Professor, Departments of Immunology and Medical Biophysics, University of Toronto, Canada.
- since 1998 Associate Professor (Dozent), Department of Experimental and General Pathology, University of Innsbruck, Austria.
- since 1998 Full Member; School of Graduate Studies, University of Toronto.
- 1999-2002 Associate Professor, Departments of Immunology and Medical Biophysics, University of Toronto, Canada.
- 2002-2004 Full Professor, Departments of Immunology and Medical Biophysics, University of Toronto, Canada. Since 2002 Scientific and Founding Director, IMBA, Institute for Molecular Biotechnology of the Austrian Academy of Sciences, Vienna. Austria
- Since 2004 Adjunct Full Professor, Departments of Immunology and Medical Biophysics, University of Toronto, Canada
- since 2004 Professor of Genetics, University of Vienna, Austria
- since 2004 Honorary Professor of Peking Union Medical College/Chinese Academy of Medical Sciences, Beijing, China
- since 2010 Affiliate Scientist, Keenan Research Centre, Li Ka Shing Knowledge Institute of St. Michael's Hospital, Toronto
- Since 2011 Guest Professor of the Medical University Vienna, Austria
- Since 2011 Vice-President of ERI-ICP (European Research Institute on Intracellular Pathology), Paris.

Awards

- 1987 Special fellowship from the Austrian Ministry for Arts and Science.
- 1988 Scholarship from the European Federation of Immunological Societies.
- 1990 "Highest talented" Award from the Rotary Club Innsbruck.
- 1991 "Anton von Eiselsberg" price for best medical related scientific work in Austria (awarded for data from my thesis).

- 1990-1992 "Erwin Schroedinger" Fellowship from the Austrian Fonds zur Foerderung der Wissenschaftlichen Forschung.
- 1993 "Austrotransplant-Biotest" price from the Austrian Society of Transplantation, Transfusion and Genetics.
- 1994 Talentefoerderpraemie (talent price for science and culture) from the province of Upper Austria.
- 1994 National Medal of Technology – awarded by the US President (as member of Amgen)
- 1999 "The William E. Rawls Prize" (for outstanding contribution to cancer research) from the National Cancer Institute of Canada
- 2000 Included in the "Celebration of Canadian Healthcare Research" of leading historical and contemporary medical scientists in Canada during the 20th century selected by The Association of Canadian Medical Colleges, The Association of Canadian Teaching Hospitals, The Alumni and Friends of the Medical Research Council and Partners in Research
- 2000 Selected as a "Young leader in Medicine in Canada" by the Globe and Mail (a total of 4 "leaders" were selected) to commemorate 133 years of Canada in the new millennium University of Toronto
- 2000 Top 10 list of the "hottest" scientists in 1998 and 1999 in the world (according to ISI and based on most paper citations)
- 2000 Canadian Research Chair in Cell Biology
- 2001 Top 10 list of the "hottest" scientists in 1999 and 2000 in the world (according to ISI and based on most paper citations)
- 2001 Named One of Canada's Top 40 under 40
- 2001 Honorary member of the Golden Key Society
- 2002 Young Canadian Explorer Award (from CIAR)
- 2002 Listed among the 10 most promising scientists in all fields in the world by Esquire magazine
- 2002 Elected to the Austrian Academy of Sciences as Corresponding member
- 2003 Landeskulturpreis fuer Wissenschaft von Oberoesterreich (Culture Prize for Science from the province of Upper Austria)
- 2003 International Research Prize in Bone Research
- 2003 Austrian Scientist of the Year Award
- 2003 Recipient of an EU Excellence grant

2004	Elected to the Deutsche Akademie der Naturforscher Leopoldina
2004	Austrian'04 award
2005-2010	Young Global Leaders 2005 (elected from The Forum of Young Global Leaders/World Economic Forum)
2006	Descartes Prize (the highest EU research prize)
2007	Ernst Jung-Preis for Medicine
2007	Elected as the youngest full member to the Austrian Academy of Sciences
2007	Wellenreiterpreis by the Austrian Management Club (received for the promotion of science and central Europe integration)
2007	Carus-Medaille of the Deutsche Akademie der Naturforscher Leopoldina (received for cancer research and cardiovascular diseases)
2008	Carus-Prize of the City of Schweinfurt
2008	Included to list of 1000 most important Austrian immigrant/emigrants in politics, arts, sports, philosophy, business, or music, from 1900-2008.
2008	Karl Landsteiner prize of the Austrian Society of Immunology and Allergology
2008	Elected as EMBO member
2008	Recipient of the first ERC Advanced grants.
2009	ESCI Award by the European Society for Clinical Investigation
2009	Medal of The Australian Society for Medical Research (ASMR)
2009	Elected to the Academy of Europe (Academia Europaea)
2009	Elected member - European Research Institute for Integrated Cellular Pathology (ERI-ICP).
2010	Elected member - European Academy for Tumor Immunology (EATI)
2012	Elected AAAS Fellow for " <i>efforts on behalf of the advancement of science or its applications are scientifically or socially distinguished.</i> "
2012	Innovator Award, Era of Hope/DOD.
2013	Recipient of a second ERC Advanced grant.
2014	Recipient of Wittgenstein Award (highest Austrian Science Award)

Support: I have been holding competitive grants since 1995 in Canada and since 2003 in Austria and the European Union including Candia research Chair, EU Excellence grant, or ERC Advanced grants.

Current grant support:

2014 – 2019: **Advanced ERC grant** holder of the EU (EUR 2,500.000 total)
“HAPLOID”; “Yeast” genetics in mammalian cells to identify and validate
fundamental mechanisms of physiology and pathophysiology”

2012 – 2017: **Innovator Award of the US Department of Defense**; “Novel
approaches to breast cancer prevention and inhibition of metastases” (USD
7.400.000)

2011 – 2016: **Transatlantic Network of Excellence**, Leducq Foundation,
“Genomic, epigenomic and systems dissection of mechanisms underlying dilated
cardiomyopathy” (EUR 547.000)

Most significant scientific contributions:

Our basic approach is to genetically manipulate and change genes in mice and to determine the effects of these mutations in development of the whole organism and in diseases. From these mutations we are trying to establish basic principles of development and basic mechanisms of disease pathogenesis. On all the listed contributions below I am the principal investigator who coordinated the research and came up with the ideas. Web of Science (January 2014) H-factor: 92. [H-factor using Google scholar: 108]. Times cited 37581.

H-factor: ISI: 92 (<http://www.researcherid.com/rid/I-6860-2013>)

and Google Scholar: 108 (<http://scholar.google.at/citations?user=OdIFIsMAAAAJ>)

(1995) Identification of a cell population in our body that spontaneously kills tumor cells as a proof of immunosurveillance in vivo [Penninger et al. Nature]

(1997) Identification of a genetic principle how cells sense stress [Nishina et al. Nature].

(1998) Identification of a molecular motor (Vav1) that allows cells to cluster the antigen receptor [Fischer et al. Curr. Biol. 1998; Penninger & Crabtree, Cell 1999].

(1999) First genetic proof that OPGL (RANKL) is the critical regulator for osteoclasts that controls bone loss in old age osteoporosis, cancer metastases, tooth loss, or arthritis [Kong et al. Nature].

(1999) First molecular explanation why children with acute leukemias, and patients suffering from people with leukemias, melanomas, breast cancers or prostate cancers, asthma, chronic infections (AIDS, hepatitis, tuberculosis), diabetes or multiple sclerosis suffer bone loss. We also identified the molecular principle of

bone loss in arthritis. Based on these findings, drugs have been developed with the potential to block bone loss in all of these diseases [Kong et al, Nature].

(1999) Identification of a causal link between bacterial infections and heart disease. [Bachmaier et al. Science].

(2000) Identification of Cbl-b as a first E3 ligase that controls T cell activation and T cell tolerance. [Bachmaier et al. Nature 2000; Krawczyk et al. Immunity, 2000]

(2000) Elucidation of the role of PI3K γ in T cell and neutrophil functions [Sasaki et al. Science].

(2000) First molecular and evolutionary explanation for gender bias and sex hormone regulation of bone loss in females [Fata et al. Cell].

(2000) First paper to show that OPGL (RANKL) regulates tooth loss and that system functions in human immune cells [Teng et al. J. Clin. Invest.].

(2001) Genetic identification of a mitochondrial-regulated, caspase-independent pathway that controls cell death [Susin et al. Nature 1999; Joza et al. Nature 2001].

(2002) Identification of the central role of the DREAM gene in pain perception and a novel paradigm in pain research [Cheng et al. Cell].

(2002) Identification of ACE2 as a novel heart failure gene [Crackower et al. Nature].

(2002) Elucidation of two distinct PI3K signaling pathways that control heart muscle cell size and heart muscle function [Crackower et al. Cell].

(2003) Identification of Carma1/CRD11 as essential molecule in T cell activation and antigen receptor induced NfKB activation [Hara et al. Immunity]

(2003) Identification of a gene that regulates male specific fertility and controls for chromosome pairing [Crackower et al. Science].

(2003) Elucidation of cooperation between adaptive and innate immunity that is required by dendritic cell-induced autoimmune heart failure [Eriksson et al. Nature Medicine].

(2004) Identification of the essential role of the E3 ubiquitin ligase Cbl-b in T cell anergy induction [Jeon et al. Immunity.].

(2004) Elucidation of dexas1 potentiates photic and suppresses non-photic responses of the circadian clock. [Cheng et al. Neuron].

(2005) Identification of the molecular scaffold Gab2 as a crucial component of RANK signaling and osteoclastogenesis [Wada et al. Nature Medicine].

(2005) Identification of the SARS-coronavirus receptor ACE2 as a crucial factor in SARS pathogenesis [Kuba et al. Nature Medicine].

(2005) ACE2 protects from Severe Acute Lung Failure [Imai et al. Nature].

(2006) Identification of a novel soil factor, RANKL/RANK, that could explain selective cancer metastases to bones [Jones et al. Nature.].

(2006) First identification of genes that control electricity regulated wound healing [Zhao et al. Nature].

(2006) Identification of a novel amino acid transport molecule in the kidney with direct connection to diabetes [Danilczyk et al. Nature].

(2007) Identification of HACE1 as a novel tumor suppressor involved in multiple cancers [Zhang et al. Nature Medicine].

(2007) Identification of the E3 ligase Cbl-b as a key molecule involved in tumor rejection [Loeser et al. J. Exp. Med.].

(2007) First description that primary genetic defects in mitochondrial OxPhos can protect from diabetes and obesity [Pospisilik et al. Cell].

(2008) Identification of a common lung injury pathway in bird flu, SARS, or anthrax [Imai et al. Cell].

(2009) First *in vivo* whole fly genome screen on innate immunity [Cronin et al. Science].

(2009) Identification of RANKL/RANK as central regulators of fever and female body temperature [Hanada et al. Nature].

(2010) Whole genome *in vivo* screen on obesity in *Drosophila* and identification of a novel regulator for white and brown fat development in mammals [Pospisilik et al. Cell].

(2010) First whole genome *in vivo* screen on heart failure in *Drosophila* and identification of CCR4/Not as regulator of heart failure in mice and sudden cardiac death in humans [Neely et al. Cell].

(2010) Identification of RANKL/RANK as a key regulator of progestin-driven breast cancer [Schramek et al. Nature].

(2010) Establishment of the first animal model for synesthesia derived from a first whole genome behavioral scan on thermal nociception [Neely et al. Cell].

(2011) MKK7/JNK signaling link oncogenic stress to p53 stability and lung cancer and breast cancer development [Schramek et al. Nature Genetics].

(2011) Establishment of the first haploid mouse ES cells combining “yeast” genetics with stem cell pluripotency for effective forward and reverse genetic screening [Elling et al. Cell Stem Cell].

(2012) Identification of ACE2 as a key regulator of intestinal amino acid uptake controlling the gut microbiome [Hashimoto, Perlot, et al. Nature, cover story].

(2013) Discovery of a new RNA species that links oxidative stress to motor neuron loss and muscle paralysis [Hanada, Weitzer, et al. Nature Full Article].

(2014) identification of a mechanism to activate the innate immune system to reject cancer metastases [Paolino et al. Nature].