

Dr. Zoltán Ivics (Curriculum vitae)

Personal Data

- Date of birth: 22.01.1964
- Place of birth: Budapest, Hungary
- Citizenship: Hungarian
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Education

- 1978-1982: II. Rákóczi Ferenc Secondary School, Budapest, Hungary
- 1983-1988: University of Agricultural Sciences, Gödöllő, Hungary
- 1988: MS (agricultural sciences, English-Hungarian technical translation)
- 1988-1994 graduate student, Hungarian Academy of Sciences (fellowship), University of Agricultural Sciences/ Gödöllő/ Hungary
- 1994: PhD
- 2013: DSc (Doctor of the Hungarian Academy of Sciences)

Professional Positions

- 1988-1991: Research Assistant, Agricultural Biotechnology Research Center, Gödöllő, Hungary
- 1991-1994: Visiting Research Fellow, University of Minnesota, USA
- 1994-1997: Postdoctoral Associate, University of Minnesota, USA
- 1997-1997: Research Associate, University of Minnesota, USA
- 1997-1999: Visiting Scientist, The Netherlands Cancer Institute, The Netherlands
- 1999-2011: Group Leader, Max Delbrück Center for Molecular Medicine, Berlin, Germany
- 2010-: Guest Professor, University of Debrecen, Debrecen, Hungary
- 2011-: Head of Division, Division of Medical Biotechnology, Paul Ehrlich Institute, Langen, Germany

Major scientific achievement

Molecular reconstruction of the Sleeping Beauty transposable element. Sleeping Beauty not only represents the first DNA-based transposon ever shown to be active in cells of vertebrates, but the first functional gene ever reconstructed from inactive, ancient genetic material, for which an active, naturally occurring copy either does not exist or has not yet been isolated. Technologies based on Sleeping Beauty gene transfer have been revolutionizing genome engineering in vertebrate species.

Publication record (total career)

>110 peer-reviewed articles; Impact Factor: >1000; Independent Citations: >6000; H-index: 38 (Research Gate, as of 08.06.2016)

Theses and Diplomas under my guidance

- Hatem Zayed, Improvement of the Sleeping Beauty transposon, PhD thesis, Sept 2003
- Oliver Walisko, Regulation of Sleeping Beauty transposition in vertebrate cells, PhD thesis, Dec 2004
- Csaba Miskey, Molecular resurrection of two highly active vertebrate transposable elements for genetic applications, PhD thesis, Apr 2005
- Andrea Schorn, Characterization of Molecular Mechanisms Regulating Sleeping Beauty Transposition, PhD thesis, Jan 2009
- Tobias Jursch, Regulation of DNA transposition by DNA methylation and chromatin structure in human cells, diploma thesis, Nov 2004, and PhD thesis May 2010
- Katrin Voigt, Target-selected DNA transposition with engineered zinc finger DNA binding proteins, PhD thesis, Nov 2010
- Ismahen Ammar, Targeted DNA transposition in human cells, PhD thesis, Jan 2011
- Ivana Grabundzija, Development of Sleeping Beauty and Frog Prince transposon-based gene trapping in mouse embryonic stem cells and in mice in vivo, PhD thesis, Jan 2013
- Marta Swierczek, Sleeping Beauty transposition-mediated gene therapy of Gaucher disease, PhD ongoing, 2009 June-
- Mareike Becker, Regulation of Sleeping Beauty transposition by HMGB1, diploma thesis, Apr 2003
- Heiko Keller, Gene trapping with Frog Prince transposon vectors in zebrafish, diploma thesis, Jan 2007
- Frank Rolfs, Role of HMG2L1 in the regulation of Sleeping Beauty transposition, diploma thesis, July 2007
- Frank Schulze, tRNA gene-specific zinc finger proteins for transposon targeting, diploma thesis, Dec 2009
- Susann Hüttl, tRNA gene-specific zinc finger proteins for transposon targeting, diploma thesis, Oct 2010

Other Academic Activities

Patents

- Inventor of 9 granted and pending patents in transposon technology.

Conference organization

- Co-organizer of the 6th Annual International Conference on Transposition and Animal Biotechnology in 2008 at the MDC in Berlin, Germany.
- Co-organizer of the workshop on "Recombinase-mediated Gene Transfer" in 2008 in Brugge, Belgium.
- Co-organizer of the FASEB Summer Research Conference "Mammalian Mobile DNA" (Big Sky, Montana, USA, 2013).
- Organizer/conference chair of the Conference on Transposition and Genome Engineering (Budapest, Hungary, 2013).
- Co-organizer of the FASEB Summer Research Conference "Mammalian Mobile DNA" (West Palm Beach, Florida, USA, 2015).

Awards

- Molecule of the Year 2009 - International Society for Molecular and Cell Biology and Biotechnology Protocols and Researches

Editor

- Co-editor of a special issue of Genome Biology entitled "Transposons in Vertebrate Functional Genomics" containing 16 review articles written by leaders of the field.
- Co-editor of a special issue of Seminars in Cancer Biology entitled "Repetitive Elements and Genome Instability" containing 8 review articles written by leaders of the field (Volume 20, Issue 4, pp. 197-278, August 2010).
- Editor of a special Hot Topic issue of Current Gene Therapy entitled "Recombinase Technologies for Gene Therapy" containing 8 review articles written by leaders of the field (Volume 11, Number 5, October 2011).

Editorial boards

- Journal of RNAi and Gene Silencing
- Molecular Therapy
- Molecular Therapy - Nucleic Acids
- The Open Gene Therapy Journal
- Mobile DNA
- Mobile Genetic Elements

Membership

- Member of the Board of the European Society of Gene and Cell Therapy (ESGCT), since 2012
- European Society of Gene and Cell Therapy, Vector Committee (elected member), since 2010
- Faculty member of the Center for Cell and Gene Therapy of the LOEWE (Landes-Offensive zur Entwicklung Wissenschaftlich-ökonomischer Exzellenz) program in Hessen, Germany, since 2012
- European Society of Gene and Cell Therapy, Member of the Board (elected), since 2012

Education activities towards the public

- Interview in a talk-show in Hungarian television (MTV1), 2004
- Scientific documentary and interview in Hungarian television (Duna TV), 2004
- Report and interview in German television (ZDF), 2010

Ad hoc reviewer

- Nature Methods
- Nature Protocols
- Molecular Cell
- PNAS
- Nucleic Acids Research

- PLoS Genetics

Conference Presentations (international) – Invited speaker (selected)

- Keystone symposium on Transposition – Santa Fe, USA, 2003
- Annual Meeting of the Japanese Society of Molecular Genetics – Kobe, Japan, 2003
- Annual conference of the Beckman Center for Transposon Research - Minneapolis, USA, 2005
- Annual meeting of the German Society of Gene Therapy – Würzburg, Germany, 2005
- ASM conference "Mobile DNA" – Banff, Canada, 2006 (session chair and speaker)
- Annual meeting of the British Society of Gene Therapy – London, UK, 2006
- 2nd FASEB Conference on Mammalian Mobile DNA - Tucson, USA, 2007
- XVth Annual Congress of the European Society of Gene and Cell Therapy – Rotterdam, The Netherlands, 2007 (session chair)
- EUCOMM/VW mouse mutagenesis conference - Tegernsee, Germany, 2008
- 2nd Conference on Drug Delivery and Translational Research - New York, USA, 2008
- XVIth Annual Congress of the European Society of Gene and Cell Therapy annual meeting – Brugge, Belgium, 2008
- 2nd International Conference and Workshop on the Genomic Impact of Eukaryotic Transposable Elements – Asilomar, USA, 2009 (speaker and session chair)
- 3rd FASEB Conference on Mammalian Mobile DNA - Snowmass, USA, 2009
- 5th Stem Cell Clonality and Genotoxicity Retreat – Hannover, Germany, 2009
- XVIIth Annual Congress of the European Society of Gene and Cell Therapy annual meeting – Hannover, Germany, 2009
- Annual meeting of German Society of Radiobiology Research (GBS) – Essen, Germany, 2009
- Fifth European BioTechnology Workshop – Ittingen, Switzerland, 2010 (keynote speaker)
- XIXth Annual Congress of the European Society of Gene and Cell Therapy annual meeting – Brighton, UK, 2011 (speaker and session chair)
- 4th FASEB Conference on Mammalian Mobile DNA - Snowmass, USA, 2011
- 4th International Conference on Retroviral Integration - Siena, Italy, 2011
- Annual meeting of the German Society of Gene Therapy – Frankfurt, Germany, 2012
- Fujihara Seminar "Horizons on Transposon Research – Kyoto, Japan, 2012
- FASEB Conference on Genome Engineering – Lucca, Italy, 2012
- Annual Conference of the German Society of Gene Therapy (DGGT) - Hamburg, Germany, 2013 (speaker and session chair)
- INSERM Workshop "Genome engineering and targeting with artificial TALEs" - Bordeaux, France, 2013
- 5th FASEB Conference on Mammalian Mobile DNA - Big Sky, USA, 2013
- XXIst Annual Congress of the European Society of Gene and Cell Therapy (ESGCT) - Madrid, Spain, 2013 (speaker and session chair)
- 9th Stem Cell Clonality and Genotoxicity Retreat – Madrid, Spain, 2013
- Annual Conference of the German Society of Gene Therapy (DGGT) - Ulm, Germany, 2014 (speaker and session chair)
- 3rd International Annual Conference of the German Stem Cell Network (GSCN) - Frankfurt/Main, 2015
- 6th FASEB Conference on Mammalian Mobile DNA - West Palm Beach, USA, 2015

- FEBS3+ - Portoroz, Slovenia, 2015
- BIOTECHNICA "Genome Engineering" Conference - Hannover, 2015
- Conference on Transposition and Genome Engineering - Nara, Japan, 2015

Fellowships

- 1988 Hungarian Academy of Sciences, doctorate fellowship
- 1996 Human Frontier Science Program Organization (HFSP), short-term postdoctoral research fellowship
- 1997 Organization for Economic Cooperation and Development (OECD), postdoctoral research fellowship

Research Grants

(currently active grants in italics)

- 2000 European Commission FP5, research grant, PI and coordinator
Transposon-based strategies for functional genomic analyses in *Xenopus tropicalis*, a vertebrate model system for developmental and biomedical research (JUMPY)
- 2003 Volkswagen Stiftung, research grant, PI
Transposable element-mediated conditional loss-of-function and gain-of-function mutagenesis in zebrafish
- 2004 Deutsche Forschungsgemeinschaft, research grant, PI
Roles of DNA repair pathways in Sleeping Beauty transposition in vertebrate cells
- 2004 European Commission FP6, research grant, PI
Translational and Functional Onco-Genomics: from cancer-oriented genomic screenings to new diagnostic tools and improved cancer treatment (TRANSFOG)
- 2005 Bundesministerium für Bildung und Forschung (NGFN-2), research grant, PI
Determining the genes underlying the Williams-Beuren syndrome by generating allelic series of mutations using novel transposon approaches
- 2005 European Commission FP6, research grant, PI and co-coordinator
Development and application of transposons and site-specific integration technologies as non-viral gene delivery methods for ex vivo gene-based therapies (INTHER)
- 2006 Deutsche Forschungsgemeinschaft Schwerpunktprogramme, research grant, PI
Mechanism of target site selection in Sleeping Beauty transposition and its experimental manipulation for targeted transgene insertion in human cells
- 2008 Bundesministerium für Bildung und Forschung (NGFNplus), research grant, PI
Neuroblastoma: Transposon-based mutagenesis screen in mice
- 2009 European Commission FP7, research grant, PI
Persisting transgenesis (PERSIST)
- 2009 European Commission FP7, research grant, PI
Comparative stem cell research in mouse and humans (InduStem)
- 2009 Bundesministerium für Bildung und Forschung, research grant, PI
Innovative cell- and gene therapy for Morbus-Gaucher type 2: Nonviral gene transfer by Sleeping Beauty-based vectors for the gene therapy of Gaucher Syndrome
- 2009 Deutsche Forschungsgemeinschaft Schwerpunktprogramme, research grant, PI
Assessing and improving the safety profile of Sleeping Beauty transposon-mediated gene transfer in human cells
- 2010 Bundesministerium für Bildung und Forschung, research grant, PI and coordinator
Reprogramming, differentiation and safety assessment of induced pluripotent stem cells obtained by novel, innovative genome engineering technologies and small molecule modulators (ReGene)

- 2011 *Deutsche Forschungsgemeinschaft, research grant, PI*
Sleeping Beauty transposon-mediated transgenesis in the pig genome
- 2012 *Bundesministerium für Bildung und Forschung, research grant, PI*
Sleeping Beauty transposition-based approaches for in vivo gene therapy of cystic fibrosis
- 2012 *European Commission FP7, research grant, PI*
Transposon-based, targeted ex vivo gene therapy to treat age-related macular degeneration (TargetAMD)
- 2014 *Deutsche Forschungsgemeinschaft, research grant, PI*
Generation of a Fanconi Anemia model in the pig by advanced genome engineering
- 2015 *Deutsche Forschungsgemeinschaft, research grant, PI*
Functional characterization of the Harbi1 and Naif1 transposon-derived genes in vertebrates
- 2015 *Deutsche Forschungsgemeinschaft, research grant, PI*
Therapeutic gene delivery with Sleeping Beauty transposon vectors: Assessment of preclinical efficacy and safety in a mouse model of Gaucher disease

Teaching activities

Dr. Ivics has been involved in teaching in the context of a practical course "Biochemistry II – Gene Modification 2" to undergraduate students enrolled at the Goethe-Universität Frankfurt am Main for three weeks per year since 2011. In addition, he teaches Molecular Biotechnology two semesters per year (10 lectures per semester) at the Goethe-Universität Frankfurt am Main since 2015.