

Mayo Clinic

Dean, Mayo Clinic Graduate School of Biomedical Sciences
Professor, Department of Biochemistry and Molecular Biology
Director, Mayo Clinic Office of Entrepreneurship
Scientific Director, Mayo Clinic Zebrafish Facility
Editor-in-Chief, the *Zebrafish* journal
Founding President, Genome Writers Guild genome engineering society
Past President, Zebrafish Disease Models Society

Professional Contact Information:

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Rochester, MN 55905
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Mayo Clinic email: ekker.stephen@mayo.edu

Academic Websites:

zfishbook.org

morpholinodatabase.org

talendesign.org

genesulpt.org

Personal Contact Information: stephen.ekker@gmail.com

Mobile: 507-250-5215

Other emails: ekker.stephen@gmail.com; ekker001@umn.edu; scekker@me.com

Integrated Science Education Outreach (InSciEd Out)

Board of Directors, InSciEd Out Foundation

Website:

insciedout.org

Entrepreneurship

Founder and Director, Walleye Tank Pitch Competition

walleyetank.com

Co-Founder, Discovery Genomics (now Immusoft)

CEO and Co-Founder, LifEngine Technologies Inc

Principal and Co-Founder, Forge Biotechnology LLC

Now Mettaforge Therapeutics Inc.

Co-Founder, LifEngine Animal Health Laboratories Inc.

Email: steve@leahlabs.com

Entrepreneurial websites:

lifenginetechnology.com

leahlabs.com

Entrepreneurship Highlights

1) I started my first biotech company while at the University of Minnesota, called Discovery Genomics Inc (DGI). DGI was acquired in 2016 as key technology and staff for Immusoft's B cell programming platform. As a Founder, I played diverse roles in DGI over time, but after the acquisition my job is as a vested shareholder and cheerleader as Immusoft works to develop new therapies using gene edited programmed B cells.

Immusoft is now nicely set up for their pioneering clinical work thanks to a key partnership with Takeda worth up to \$900M:

<https://www.bloomberg.com/news/articles/2021-10-13/takeda-to-work-with-immusoft-in-900-million-rare-disease-deal>

2) In non-Mayo time, I served for four years as the scientific advisory board for OpenTrons as we went from the post Kickstarter world to the new world including the opportunity that established the Pandemic Response Lab in NYC. I vested my options recently, and the OpenTrons team are now moving to their next stage of growth thanks to \$200M Softbank investment:

<https://www.bloomberg.com/news/articles/2021-09-23/softbank-invests-in-robotics-company-behind-nyc-covid-testing>

3) My most recent entrepreneurial work is focused on LEAH Labs, the first gene editing company out of the California incubator Y Combinator, focused on the OneHealth model and bringing novel biotherapeutics to treat companion animals, our dogs and cats:

<https://www.linkedin.com/company/leahlabsinc/>

It's been amazing de-risking this idea of using modern biotech for companion animals, and we now have completed a successful crowdfunding campaign (which helped validate the market) and have subsequently secured a substantial set of vets as investors. LEAH Labs has garnered ~\$2M in private equity investment and now has two US government grants to help fund tech development. After completing initial safety trials last year, LEAH labs is set to enter the clinic with first efficacy testing in 2022 with full USDA approval now in-hand.

4) As an interested party in support of entrepreneurship (and also initially outside any role for me at that time at Mayo), I am the Founder of our local pitch competition called the Walleye Tank. <http://www.walleyetank.com/>

Walleye Tank has been subsequently adopted by Mayo Clinic and the University of Minnesota as our premier event showcasing life science innovation, and has launched two other pitch competitions, Alligator Tank (Florida) and Roadrunner Sprint (Arizona).

Vision

I am at my core an optimist that believes the future is an exciting destination, and that dedicated teams working together will create a world far greater than I can imagine. My goal is to untap this potential of human capital to make this vision a reality.

Personal Statement

Research: My background in molecular genetics and genomics started with undergraduate research with a project to restriction map the genome of the Archaeobacterium *Sulfolobus solfataricus*. As a graduate student, I worked on understanding how proteins work as molecular switches. Since my training as a postdoctoral fellow, I have been using a **zebrafish-first** (*Danio rerio*) *in vivo* pioneering approach as a model vertebrate to address major issues in human health and biology, while deploying **triangulation** using human cells *in vitro* to look for overlapping outcomes as likely predictive of human biology *in vivo*. This approach has the potential for diverse genetic and behavioral studies typically restricted to the world of the fly or worm but conducted within the biological framework of a vertebrate.

My current laboratory thus uses the zebrafish as a rapid molecular test system to better understand our genome. Over twenty years ago, we established the use of morpholino sequence-specific knockdown technology for vertebrate functional genomics applications using the zebrafish as the pioneering model system. In parallel, we developed vertebrate transposon tools, including our protein trap gene-breaking vectors, to generate a collection of 1000+ molecularly characterized and revertible mutant zebrafish lines, the first engineered conditional alleles in any organism outside the mouse. We have deployed transposons in diverse application areas including human T cells, zebrafish, and mice.

Custom restriction endonucleases enable targeted DNA modification using genome editing tools. We continue to develop the science behind these new engineering toolkits, working with laboratories who study rat, pig, mouse, nematode, and fly in addition to our regular colleagues who work in human cells and zebrafish.

One important area for innovation has been the development of new approaches to mitochondrial research using this zebrafish-first approach. This ubiquitous but mysterious organelle plays a major role in health and disease. We developed a pioneering zebrafish model of mitochondrial disease encoded by the nuclearly encoded gene *Irpprc*. We have made a panel of over 35 targeted and random mutants in components of the electron transport chain and in known and novel mitochondrial proteins. And we have initiated targeted gene editing of the mitochondrial genome for deletions and now using a TALE mitochondrial base editor, a toolkit that works in zebrafish *in vivo* and human cells *in vitro*. Deploying this in fish and human cells for novel disease modeling is an exciting new opportunity for genome biology science. In addition, we are in active discussions on how to deploy this for both rare disease gene therapy as well as options for treating more common conditions like Alzheimer's.

Education: I am committed to developing the next generation of leaders in biomedical science and education, as I've moved from student to mentor to Dean, Mayo Clinic Graduate School of Biomedical Sciences (2019-present). I have served as a full-time and *ad hoc* member on NIH study panels to review training grants, and I served as

Associate Director of the MinnCRest T32 while I was a full-time faculty member at the University of Minnesota. From 2013-2019, I was Associate Director of the TL1-funded Clinical and Translational Sciences PhD track. I serve as a mentor for postdocs, graduate students, MD/PhD students, post-bacs, undergraduates, and related scientists within my laboratory. I have successfully trained 13 PhD and 5 MD/PhD students to degree completion. All of my mentees are still using their training in scientific professions, with the 4 more senior MD/PhD students as faculty at outstanding institutions (U Washington; Cincinnati Children's; U Penn; U Penn) and the latest at Duke for residency. Throughout, I have pledged to serve as an inclusive mentor, leading a mentee-focused, lifelong relationship. I learn from each mentee, and I strive to continue to individually improve, and now as Dean I help lead institutional efforts in active support for equity, inclusion and diversity. Scientific rigor, data transparency and ethics are at the core of my educational pedagogy such that we instituted a 'Scientist Oath' for faculty and all new PhD and MD/PhD students at the Mayo Clinic.

As an academic, I love helping catalyze teams and build programs to solve top problems. As a post doc, I had the opportunity to create new teams that spanned the country, with scientists from Johns Hopkins/HHMI and the University of Washington/HHMI resulting in 5 exciting papers that came out of this direct synergy. While serving on the faculty of the University of Minnesota, I helped develop a program on understanding the genome funded by an NIH R01 now in year 18 that is a collaborative grant between three institutions, I was the founding Director of the Beckman Center for Transposon Research (now the Center for Genome Engineering), Executive Director of the Nanobiotechnology program, Co-Director of the largest US training grant in dentistry, and was a co-founder for a gene therapy biotechnology company (now called Immusoft). Since moving to the Mayo Clinic over 15 years ago, I've been a founding scientist for two new P30 NIH Centers (Center for Cell Signaling, Mayo Translational PKD Center), a multi-institutional NIH-funded R24 genome engineering program, and I shared responsibility for the NIH-funded Clinical and Translational Sciences PhD track (whose grant was twice renewed). I have served as President of the international Zebrafish Disease Models Society, am the founding and past President of the Genome Writers Guild genome engineering society, and I was a founding scientist of the Undiagnosed Disease International (UDNI) consortium. I have also had the honor to work with the fantastic Integrated Science Education Outreach (**InSciEd Out**) science education team, helping build that program into one with hubs on three continents as a partnership with the Mayo Clinic and other academic institutions and its supporting 501(c)3 non-profit, InSciEd Out Foundation. My latest initiative within Mayo Clinic is the Office of Entrepreneurship, educating people and structures with entrepreneurship skills to empower scientists, engineers, community leaders, business and investors to change the world.

As a practicing entrepreneur scientist, I am focused on the fundamental shift in science culture we are living. The US government's support of research as a fraction of our GDP has continued to decline over the last half century, hitting a **60 year low** in Oct 2016 under the science-friendly Obama administration. At the same time, **there has never been more cash on the sidelines** not even earning interest. Training scientists in entrepreneurship is critical to harness the latter capital to improve the world – doing good and doing well. My goal has been to learn by example and to widely share to build an entrepreneurial community. I was a co-founder of my first biotechnology company

(now Immusoft) that completed its latest B round of financing in the new Renaissance that is gene therapy. I have been conducting genome engineering (now called **gene editing**) for over 30 years. I believe we have a once-in-a-generation opportunity for real impact through the launching of a new Trillion Dollar market using gene editing to improve current products and to make exciting innovative solutions for the world. With a fantastic team of gene editing scientists, we have launched new biotechnology companies – LifEngine Technologies whose goal is to accelerate bringing gene editing solutions to market, with its first subsidiary Forge Biotechnology focused on human cell gene editing products (now Mettaforge Therapeutics Inc), and LifEngine Animal Health Laboratories Inc focused on conquering canine cancer using CAR T cell therapies. LEAH was launched via the Y Combinator business accelerator.

Professional Experience

Inaugural Chair, BMB Entrepreneurship/Innovation Council	2022-present
Member, Research Information Technology Subcommittee	2021-present
Editorial Board Member, <i>Gene and Genome Editing</i>	2021-present
Board of Reviewing Editors, <i>eLife</i>	2020-present
Dean, Mayo Clinic Graduate School of Biomedical Sciences	2019-present
Editorial Board member, <i>CRISPR</i> journal	2017-present
Member, NIH Somatic Cell Gene Editing Coordinating Committee	2018-present
Founding Director, Mayo Clinic Office of Entrepreneurship	2018-present
Co-Founder, LifEngine Animal Health Laboratories Inc.	2018-present
Founding President, Genome Writers Guild	2017-present
Genome Engineering Society	
Co-Founder and Principal, Forge Biotechnology LLC	2017-present
Co-Founder (2016) and CEO (2017), LifEngine Technologies Inc	2016-present
Co-founding scientist, Undiagnosed Disease Network International	2014
Founder, InSciEd Out Foundation	2012-present
Board Director	2014-present
Founding member, Zebrafish Disease Models Society; VP (2015-16)	2013-present
President (2016-2017)	
Clinical and Translational Science PhD Program Director	2013-2019
Director (2013; Co-I since 2010), Model Systems Core, Mayo Translational PKD Center (MTPC)	2010-2019
Director, Genetics and Model Systems Core, Mayo Clinic Center for Cell Signaling in Gastroenterology	2009-2019
Editor-in-Chief, the <i>Zebrafish</i> journal	2008-present
Professor Department Biochemistry and Molecular Biology, Mayo Clinic, Rochester, MN	2007-present
Director, Mayo Clinic Zebrafish Facility, Mayo Clinic	2007-present
Member Graduate Faculty, Mayo Clinic Combined MD/PhD Program	2007-present
Biochemistry and Molecular Biology	
Clinical and Translation Sciences	
Biomedical Engineering and Physiology	
Virology and Gene Therapy	
Adjunct Professor, Genetics, Cell Biology and Development, University of Minnesota	2007-present

Director, Mayo Addiction Research Center	2010-2016
Director, Arnold and Mabel Beckman Center for Transposon Research (Now Center for Genome Engineering)	1999-2007
Associate Department Head, Genetics, Cell Biology and Development	2002-2007
Executive Director, U of Minnesota Nanobiotechnology Initiative	2006-2007
Minnesota Craniofacial Research Training (MinnCResT) Program Co-Director (2006-2007); Group Leader, Devel Biol. (2002-2007)	2002-2007
Associate Professor, Dept Genetics, Cell Biology and Development	2001-2007
Assistant Professor, University of Minnesota Medical School	1995-2001
Department of Genetics, Cell Biology and Development	1998-2001
Department of Biochemistry	1995-1998
Faculty Senator	2000+
Member, UM Stem Cell Institute (2005), Lillehei Heart Institute (2003), Cancer Center (2001), Institute of Human Genetics (1996), Developmental Biology Center (1995)	
Co-Founder, Discovery Genomics Inc. (Now Immusoft)	2000
Member Graduate Faculty, University of Minnesota Combined MD/PhD Program	1997-present
Biochemistry, Molecular Biology and Biophysics Graduate Program	1996-present
Molecular, Cellular, Dev. Biol. and Genetics Graduate Program	1996-present
Interdisciplinary Minor, Human Genetics	2003-present
Comparative and Molecular Biosciences	2005-present
Member Graduate Faculty 2008-present Biomedical Informatics and Computational Biology	
Post-doctoral fellow	1993-1995
Biochemical Properties and Biological Activities of the <i>hedgehog</i> Gene Family Johns Hopkins School of Medicine and Howard Hughes Medical Institute Philip A. Beachy, advisor	
University of Washington and Howard Hughes Medical Institute Randall T. Moon, collaborative advisor	
Graduate dissertation	1988 - 1993
Differential DNA Binding and the Specificity of Homeotic Gene Action Johns Hopkins School of Medicine and Howard Hughes Medical Institute Philip A. Beachy, advisor	
Teaching assistant	1990 - 1992
Graduate Course, Genetics, Department of Molecular Biology and Genetics	
Undergraduate research	1986 - 1988
Restriction Mapping the Genome of the Archaeobacterium <i>Sulfolobus solfataricus</i> University of Illinois; C.R. Woese, advisor	

Education

Doctor of Philosophy Molecular Biology and Genetics Johns Hopkins University, Baltimore, MD	May 24, 1993
BS Genetics and Developmental Biology University of Illinois Urbana-Champaign, Urbana, IL	May, 1988
BS Electrical Engineering University of Illinois Urbana-Champaign, Urbana, IL	May, 1988

Honors and Awards

March of Dimes Basil O'Connor Scholar	1997 - 1999
March of Dimes Birth Defects Foundation Predoctoral Fellow	1990 - 1993
Graduation With Honors, BS Electrical Engineering	1988
Dean's List -- University of Illinois, 6 semesters	1985 - 1988
James Scholar -- University of Illinois Honors Program	1983 - 1984
Member Eta Kappa Nu -- National Electrical Engineering Honor Society	
Member Phi Kappa Phi	
Member National Honor Society	
Howard Hughes Medical Institute UM Faculty Nominee	2004
Faculty of 1000, invited member	2013-present

Professional Affiliations

American Association for the Advancement of Science
 Genetics Society of America
 Society for Developmental Biology
 American Society of Human Genetics
 Society for Neuroscience
 International Zebrafish Society, inaugural member
 Zebrafish Disease Models Society, inaugural member
 Genome Writers Guild, inaugural member
 American Society for Gene and Cell Therapy

External Advisory Board

Oklahoma Medical Research Foundation (OMRF)	2018-present
Center for Genome Engineering, U MN	2019-present

Scientific Research Consultant

Alexion Pharmaceuticals Inc.	2016-2017
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Editorial Board Membership

Briefings in Functional Genomics and Proteomics	2001-present
<i>Zebrafish</i>	2003-present
Experimental Biology and Medicine	2007-2019
BMC Genomics, Associate Editor	Mar 2010-present
BioResearch Open Access, Editor	Mar 2012-present
The CRISPR Journal, Editor and charter member	2017-present
eLife Board of Reviewing Editors	2020-present
Gene and Genome Editing, Editor	2021-present

Society Leadership

Zebrafish Disease Models Society, founding Board Member, President, 2016-17	2013-present
Genome Writers Guild, founding member, President, 2017-2019; Board, 2019-2020	2017-present

Reviewer Responsibilities

Journals (comprehensive itemization for this section of the CV ended 2007):

Development, Developmental Biology, Journal of Cell Biology, FEBS Letters, Gene, Mechanisms of Development, Nature, Nature Genetics, Biotechniques, Science, Genomics, J Neurophysiology, Teratology, Human Molecular Genetics, Molecular Biology and Evolution, PNAS, Hepatology, Developmental Dynamics, Blood, Genome Biology, Molecular Pharmaceutics, Molecular and Cellular Biology, Cellular and Molecular Life Sciences, BMC Biotechnology, Zebrafish, PLOS Biology, BMC Developmental Biology, Arteriosclerosis, Thrombosis, and Vascular Biology; Development, Genes and Evolution; BBA; TIBS; Physiological Genomics; J Biotechnology; Human Mutation; Gene Expression Patterns; Gene Therapy; Nature Reviews : Genetics; Genes, Chromosomes and Cancer; Genetics; FASEB; Molecular Biology and Evolution; Journal of Cellular Biochemistry; Nature Methods; BMC Genomics; BMC Biotechnology; Neuroscience

Development 01/04, 03/04; MOD 4/99, 10/01, 03/02, 04/02, 6/02, 12/02, 1/04, 12/04, 10/06; Dev Biol 05/99, 04/00, 11/01, 10/02, 12/02, 03/04, 01/06, 03/06; Genesis 08/00, 08/01, 02/07; Differentiation 11/00; Nature Genetics 11/00, 01/01, 06/05, 11/07; Biotechniques 01/01, 02/02, 06/03, 08/03; Science 08/01, 04/03, 09/07; Genomics, 10/01; J Neurophysiology 11/01; FEBS Letters 12/01; Nature 10/02; Teratology, 10/02, Human Molecular Genetics 11/02, 07/07; Molecular Biology and Evolution 02/03; PNAS 02/03, 09/05, 05/06, 01/07; Hepatology 03/03; Dev Dynamics, 06/03, 06/03, 01/07, 01/07; Blood, 08/03, 06/04, 12/04, 09/05, 08/06, 02/07, 03/07, 06/07, 09/07; 01/08; 02/08 Genome Biology, 11/03, 11/06, 02/07; Molecular Pharmaceutics 02/04; Molecular and Cellular Biology, 05/04, 08/04; CMLS 06/04; BMC Biotechnology 08/04; Zebrafish 08/04; PLOS Biology 09/04; Atherosclerosis, Thrombosis, and Vascular Biology 10/04, 05/06; PLOS Genetics 02/05; DGE 03/05; BMC Developmental Biology 04/05, 06/07; BBA 05/05; TIBS 07/05, 12/06; Physiological Genomics 08/05; J Biotechnology 10/05; Human Mutation 10/05; Gene Expression Patterns 11/05, 07/06; Gene Therapy, 01/06; Nature Reviews : Genetics 04/06, 02/07; Genes, Chromosomes and Cancer 05/06; Genetics 06/06; FASEB 07/06; Molecular Biology and Evolution 07/06; Journal of Cellular Biochemistry 09/06; BMC Dev Biology 10/06, 03/07, 09/07; Nature Methods 11/06; BMC Genomics 11/07; 01/08; Neuroscience 08/08

Genetics 01/14; DMM 01/14; J Neu Meth 01/14; Nature biotech 02/14; 02/14; J Physiology 02/14; Dev Cell, Development

Invited Tenure Reviews – service as outside reference

Jim Du (Center for Marine Biotechnology, Baltimore, MD)

James T. Warren (Penn St. Erie)

Mary Montgomery (Macalester College, MN)

Paul Mead, St Jude Children's Research Hospital

Missouri Provost Outstanding Junior Faculty Research and Creative activity Award

Reviewer: Anand Chandrasekhar

Keith Cheng, Penn St – Hershey

Ken Kramer, NIH

Shannon Fisher, Johns Hopkins University

Shawn Burgess, NIH

Vladimir Korzh, Singapore
Qin Liu, University of Akron
James Chen, Stanford
Jeffrey Yoder, N.C. State University
Raymond Habas, Temple University
Kurt Svoboda, UWM
Jau-Nian Chen, UCLA
Aron Geurts, Medical College of Wisconsin
Josh Gamse, Vanderbilt
Karen Guillemin, Oregon
Ann Morris, U Kentucky
Anindya Bagchi, U Minnesota
Ethan Scott, U Queensland
Arne Lekven, Texas A&M
Caroline Brennan- Queen Mary University of London
Eleanor Chen, University of Washington
Joan Heath, The Walter and Eliza Hall Institute of Medical Research
Qing Deng, Purdue
Keith Cheng, Harvard
Shondra Pruett-Miller, St. Jude's
Jamie Gagnon, Utah

Penn St Functional Genomics Program External Review Board Member
Marshall University Scientific Advisory Committee – Differentiation and Development

Grant agencies (*Full Member of a Standing Study Panel):

Maryland Sea Grant, National Sea Grant, Whitehall Foundation, Wellcome Trust, NSF, NIH, Austrian Genome Research Programme, Carver Charitable Trust, MRC (UK), Pittsburgh Life Sciences Greenhouse, Health Research Board Ireland, Canada Genome, Austrian Science Fund, March of Dimes

Wellcome Trust 01/01, 10/02, 07/03, 05/04; 07/05; 08/06; 06/07; 11/11
Austrian Genome Research Programme 03/02
Carver Charitable Trust 06/03; 07/07
Medical Research College (London) 02/04; 01/07
Pittsburgh Life Sciences Greenhouse 04/04
Maryland Sea Grant 05/04
Canada Genome 02/05
Health Research Board Ireland (03/05)
Austrian Science Fund (11/05)
National University of Singapore (10/06)
March of Dimes (01/08)
Wellcome Trust Sanger Institute Program Review, 01/2010
New Jersey Commission on Cancer Research Review, 01/2010
Israel Science Foundation 04/2010
University of Minnesota Stem Cell Institute, 2014; 2015
University of Pune PhD thesis external reviewers

Mayo Clinic Alumni Association - Kendall/Balfour Awards for 2016
NIH Board of Scientific Counselors, 06/07

NSF

NSF (ad hoc) 03/99; 09/99; 03/01; 03/01; 04/01; 08/01; 08/03; 11/04; 10/05; 08/06 (3);
03/11
*NSF Developmental Mechanisms Panel Regular Member 04/02; 04/03; 04/04

NIH

NIH NCRR 10/99
NIH NHLBI Special Emphasis Panel 06/00
NIH NIGMS PPG 01/02
NIH CDF4 (Cell Development & Function) 06/02
NIH Craniofacial Study Section Special Emphasis Panel 11/02
NIH NIDDK Globin Special Emphasis Panel 11/02
NIH Genome Study Section 02/03
NIH Innovative Toxicology Models Special Emphasis Panel 07/03
NIH NDPR (Neuro Differentiation, Plasticity, and Regeneration) 10/03; 06/04
NIH Genome Study Section Special Emphasis Panel 12/03
NIH Special Emphasis Panel - Tools for Genetic Studies in Zebrafish, 04/04; 03/09
NIH Special Emphasis Panel - National Centers for Biomedical Computing, 05/05
NIH PO1 review Hematologic Malignancies, 05/05
*NIH Neurogenesis and Cell Fate, 06/05; 10/05; 02/06; Full Member 06/2006 –
06/2009
NIH MDCN-K(94) Special Emphasis Panel, Novel Genetics/Genomics Approaches to
CNS Function, 07/05
NIH NCI Cancer Nanotechnology Platform Partnerships SEP – SCE was panel chair,
07/05
NIH Cellular Aspects of Diabetes & Obesity Study Section (ad hoc), 10/05; 06/06;
10/06
NIH NHLBI Mentored Clinical Scientist Development Award Grant Review Panel,
03/06
NIH SBIR review panel 04/06
NIH NIGMS New Investigator Pathway to Independence program, 07/07
NHLBI Board of Scientific Counselors Site Review Team - June 12-15, 2007
NIH Challenge Grants review, 06/2009
NIH RC2 (GO) Grant review, 08/2009
NIH NIDA R21 Grant review, 10/2009
Full Member of the NIH College of CSR Reviewers 01/2010-present
*NIDA-K Training Grant Review Panel Full Member, 06/2010-12/2012 (end of panel)
*NIDA ZDA1 EXL-T Full Member, 06/2010-12/2012 (end of panel)
NIH RC4 5/2010
NIH NHLBI K18 11/2010
NIDA CEBRA Nov 2011
NIH/NCATS Comparative Medicine (CM) Special Emphasis Panel (SEP) Feb 13-14,
2013
NIH/CSR Neurobiology of Motivated Behavior (NMB) mail reviewer Oct 14-15, 2013

NIH/NIDA Cutting-Edge Basic Research Awards (CEBRA) program Oct 30, 2013; Mar 19 2014
NIH PPG review April 2014
NIH mail review
NIH R15 Special Emphasis Panel
NIH Special Emphasis Panel- ZRG1 CB-T(03)M July 2015
NIH NCATS Innovation grants X02/U01 Reviews - Sept 2015, April/May 2016
NIH PPG NHLBI Feb, Sept 2016
NIH GMS R35 Mar 2016
NIH CSR, ZRG1-CB-L-50, Mar 14, 2016
NIH NCATS, ZTR1-C1-9-01, CTSA U01 SEP, May 10, 2016
NIH NHLBI, HLBP Aug 31, 2016
NIH T1 Review Feb 2017
NIH CST, ZRG1-BCMB-A-51, Mar 31, 2017
NIH ZRG1-GGG-D-50 Review June 26, 2017
NIH NIDCR ZDE1-CF-13, SEP Jan 23 2018
NIH R35 MIRA Program, Oct 10-11, 2018
NIH RM1 Dec 2018
NIH Dev1, Feb 2019, ad hoc
NIH Dev1, July 1, 2019 Full Member through 2023

Entrepreneurial Activities

I am focused on the fundamental shift in science culture we are living. The US government's support of research as a fraction of our GDP has continued to decline over the last half century, hitting a **60 year low** in Oct 2016 under the science-friendly Obama administration. At the same time, **there has never been more cash on the sidelines** not even earning interest. Training scientists in entrepreneurship is critical to harness the latter capital to improve the world – doing good and doing well.

My goal has been to learn by example and to widely share to build an entrepreneurial community outside Silicon Valley or Boston. The Mayo Clinic is a traditionally innovative organization, but with modest skills or focus on entrepreneurship.

In partnership with the University of Minnesota and the broader community of investors, inventors and innovators, we have been actively building an entrepreneurial program. Byolincs was established as the local club that has launched a series of initiatives and programs.

As a part of the Clinical and Translational Sciences training grant renewal (part of our CTSA), we continue to add formal graduate courses. Based on ICORPS and Lean Startup principals, these classes empower researchers and innovators with the modern science of startups.

The Walleye Tank is an independent entrepreneurial pitch competition and event that celebrates the challenges and pay-it-forward culture of entrepreneurship. Over 100 company pitches have been shared and recorded (www.walleyetank.com).

This initiative culminated in the Mayo Clinic Research Office of Entrepreneurship (OE). The goal of OE is to focus on the education and procedures we need to empower our physicians, scientists, students and staff. We have developed new educational programming for entrepreneurs for both formal certificate and Master's educational offerings. We also work both within Mayo and externally for new women and otherwise underrepresented groups in educational leadership and entrepreneurship programming.

One unique component we have started is a floating research space called the Hatchery to empower new teams to launch startups with sufficient space and functionality to write SBIR and/or STTR grants to de-risk an experimental idea.

In addition this formal educational programming, I am using transparency and connectivity to help grow the entrepreneurial enterprise. I was a co-founder of my first biotechnology company (DGI, now Immusoft) that completed its latest B round of financing in the new Renaissance that is gene therapy. I have been conducting genome engineering (now called **gene editing**) for over 30 years. I believe we have a once-in-a-generation opportunity for real impact through the launching of a new Trillion Dollar market using gene editing to improve current products and to make exciting innovative solutions for the world. With a fantastic team of gene editing scientists, we have launched new biotechnology companies –LifEngine Technologies whose goal is to accelerate bringing gene editing solutions to market, with its first subsidiary Forge Biotechnology focused on human cell gene editing products, and LifEngine Animal

Health Laboratories Inc focused on conquering canine cancer using CAR T cell therapies. LEAH was launched via the Y Combinator business accelerator. Mettaforge Therapeutics Inc is a Mayo-based company to develop novel non-viral therapeutics.

Formal entrepreneurial activities:

Co-Founder Discovery Genomics Inc (now Immusoft) 2000

Gene editing company using non-viral *Sleeping Beauty* transposon

Byolincs Entrepreneurship Club

2014

Completed the Lean LaunchPad for Life Sciences as a team in the second Mayo Clinic Cohort, Mar 22, 2015-May 20, 2015

CTSC 6150 Case Studies in Entrepreneurship graduate class

Spring 2016

Fall 2016

Spring 2017

Fall 2017

Spring 2018

Fall 2018

Walleye Tank Entrepreneurship Pitch Competition

Spring 2016 - present

Co-Founder and CEO (current) LifEngine Technologies Inc

2016

Co-Founder Forge Biotechnology LLC

2017-2019

Co-Founder LifEngine Animal Health Laboratories Inc

2018

Scientific Advisory Board

Opentrons Labworks Inc

2016-2020

BMogen Biotechnologies Inc

2016-2018

Recombinetics, Inc

2017-2018

Patents

Issued

Ekker, S.C., Nasevicius, A., Kim, H., and Sumanas, S., Inhibition of Gene Expression using Polynucleotide Analogues. Issued 03/15/05; US Patent 6,867,349.

Licensed to Zygoten, LLC 04/2006-2009

Chen, E. and **Ekker, S.C.** Syndecans and Angiogenesis. US Patent 7713925 issued May 11, 2010.

Ma,C.H.A., Campbell,J.M., Clark,K.J., and **Ekker,S.C.** Methods and Materials for Assembling Nucleic Acid Constructs, Jan 20 2016 Application Number: 15/544,752 ; PCT filed 19-July-2017. US20180002707A1
Licensed to Forge Biotechnology LLC, Oct 20 2017

Pending

Ekker,S.C., Bedell,V.M., Campbell,J.M. *Genome Editing*. June 22, 2012. 20150291951. priority Oct 15, 2015

Ekker,S.C. and Campbell,J.M. Editing Mitochondrial DNA. 29 Jan 2016. 62/288614
Licensed to BMoGen, 2016

Campbell,J.M.. and Ekker,S.C. Mitochondrial Genome Editing Methods.
62/797823 28-Jan-2019

Ekker,S.C. and Umemoto,N. Methods and Materials for Activating Muscle Remodeling. July 14, 2016 62/362,482

Essner,J., **Ekker,S.C.**, and Clark,K.J. Materials and Methods for Efficient Targeted Knock In or Gene Replacement. 12 Jan 2017 62/531,673
Licensed to Forge Biotechnology LLC, Oct 20 2017

Ekker,S.C., Mukhopadhyay,D., Mukherjee,P., Bedell,V.M., Hoepfner,L.HJ. and Hartono,S.P. Compositions to treat ultraviolet (uv)-induced skin injury. PCT/US2017/052697; WO2018057723A1; 2016-09-21 priority date

Argue,D.P., Koleilat,A., **Ekker,S.C.**, Schimmenti,L.A., and Poling,G. Hearing Assessment Systems and Related Methods. 15/987,063 May 23, 2018

Software license

Zebrafish census and fish facility management software
Licensed to Aquaneering, 2012-2015

Meeting Organizer

Meeting coordinator, Midwest Zebrafish Meeting 7/2001 (St Paul, MN)

Meeting lead organizer and program director, International Conferences on Transposition and Animal Biotechnology

First Annual International Conference on Transposition, 07/03 (Twin Cities, MN)

Second Annual International Conference on Transposition and Animal Biotechnology, 06/04 (Twin Cities, MN)

Third Annual International Conference on Transposition and Animal Biotechnology, 06/05 (Twin Cities, MN)

<http://beckmancenter.ahc.umn.edu/html/conference%2005/Registration.html>

Fourth Annual International Conference on Transposition and Animal Biotechnology, 06/06 (Twin Cities, MN)

<http://beckmancenter.ahc.umn.edu/html/conference%2006/Registration.html>

Meeting organizer, UM Nanotherapy Workshops

University of Minnesota Nanotherapy Workshop, 11/04 (Twin Cities, MN)

<http://beckmancenter.ahc.umn.edu/nano/index.html>

Second Minnesota Biomedical Nanotechnology Workshop, 11/05 (Mayo Clinic, Rochester, MN)

<http://beckmancenter.ahc.umn.edu/nano2/index.html>

Third Minnesota Biomedical Nanotechnology Workshop, 11/06 (Minneapolis, MN)

Meeting Organizer, Midwest Zebrafish Conference, August 4-5, 2011 (Mayo Clinic, MN)

Meeting Organizer, International GI-related Zebrafish Interest Group Workshop, August 3-4, 2011

Meeting Organizer, Zebrafish and Education Summit, August 5-6, 2011

Sixth Aquatic Animal Models of Human Disease and the Midwest Zebrafish Conferences, Milwaukee, June 30 - July 3, 2013; member of Program Committee

First Zebrafish Personalized/Precision Medicine Conference, Oct 16-18, 2013 Toronto; Co-chair

International Undiagnosed Disease Network inaugural conference co-organizer, Rome, Sept 29-30, 2014

Strategic Conference of Zebrafish Investigators - Program Committee 2015

1st Walleye Tank Pitch competition, Mayo Clinic, June 2016

2nd Walleye Tank Pitch competition, Mayo Clinic, Dec 2016

Strategic Conference of Zebrafish Investigators - Program Committee 2017

3rd Walleye Tank pitch competition, organizer, University of Minnesota, April 28, 2017

Realizing the Future: Genome Engineering 2017, Genome Writers Guild Genome Engineering Conference director and organizer, July 13-15 2017

Third Zebrafish Personalized/Precision Medicine Conference, 2017 Toronto; program committee

10th Zebrafish Disease Models Society Conference meeting organizer, Aug 2017

4th Walleye Tank Pitch Competition, meeting organizer, Mayo Clinic, Dec 1 2017

First and Futures NFL Pitch Competition organization Committee, Feb 2018

5th Walleye Tank pitch competition, organizer, University of Minnesota, April 28, 2018

GWG18 Genome Writers Guild conference co-organizer, July 2018

6th Walleye Tank Pitch Competition, meeting organizer, Mayo Clinic, Dec 7, 2018

Strategic Conference of Zebrafish Investigators - Program Committee 2019

7th Walleye Tank pitch competition, co-organizer, U MN, May 3, 2019

Invited Presentations/Meeting attendee

Sunflower Developmental Genetics Symposium, Kansas City, 1996

Science's Next Wave, AAAS, 1996

Current Advances in Defining the Zebrafish Genome, Boston, 1997

Fourth Mid-Atlantic Zebrafish Meeting, Philadelphia, 1997

University of Iowa, Feb 1999

Tulane University, Mar 1999

St. Thomas University, April 1999

Genomic and Genetic Tools for the Zebrafish, NIH, May 1999

The Institute for Genomic Research (TIGR), May, 1999

Cambridge University, UK, June, 1999

EMBO Course Guest Lecturer: Methods for the Analysis of Animal Development, Sheffield, UK, June, 1999

Young Scientists Roundtable, 12/6/99

U of MN Vet Pathobiology, St Paul 12/8/99

Oral presentation, International Zebrafish Meeting, CSHL, 4/00

Sanger Centre Zebrafish Genomics Meeting Invited Speaker 10/00

FASEB, Zebrafish Minisymposium, 4/01

Midwest Development Meeting, Session Chair – Patterning, 5/01

NIH NHGRI invited speaker, 6/01

Penn St, Hershey PA 6/01

Virginia Commonwealth, 6/01

U of MN Chemical Biology Colloquium, 9/01

Cambridge Healthtech Institute, Application of Genomics to Animal Models Conference, 10/01

U of MN Biotechnology Workshop, 3/02

Genomic Tools for the Zebrafish, NIH, 4/02

2nd NIH Conference on Holoprosencephaly and Early Embryonic Development, NIH, 4/02

Johns Hopkins Medical School, Department of Pharmacology, 5/02

Teratology Society "Microarray Data Analysis and Bioinformatics", 6/02

Zygogen, 10/02 (IS THIS 2006 OR 2002?)
"Engineering the Zebrafish for the 21st Century Biologist"

Lilliehei Heart Institute, University of Minnesota, 1/03

Penn St Hershey Medical Center Genetics Symposium invited plenary speaker, 3/03

UT Southwestern, 4/03

Breast Cancer Interest Group, UM, 07/03

Society of Developmental Biology, Invited Speaker, 07/03

Cancer Center, UM, 01/04

Venture Medical Education Series 01/04

25th Annual Lorne Genome Conference invited speaker, Lorne, Australia, 02/04

U Nebraska, Genetics, Cell Biology and Anatomy Dept Seminar, 05/04

Great Plains States Society for Molecular Biology and Genetics, Omaha, NE, 06/04

Mount Desert Island Stem Cell Symposium, Maine, 08/04

U Michigan, Dept. of Human Genetics, Organogenesis Program, 02/05

American Society for Neurochemistry, 06/05

MDI Zebrafish Investigators Conference – Transposons in Zebrafish Oral Presentation;
Genetic and Genomic Tools Discussion Panelist 09/05

Leuven/UM Stem Cell Conference, Belgium, 10/05

UCLA, Zebrafish Affinity Group, 04/06

Institute of Molecular and Cell Biology, Singapore, 05/06

Institute of Genomics and Integrative Biology, New Delhi, India, 05/06

Second Biennial Angiogenesis Symposium, Mayo Clinic, Rochester, MN, Oct. 27-29, 2006

Columbus Children's Hospital, Ohio State University, Nov 2006

Mayo Clinic Cancer Center, Nov 27, 2006

UIUC Genome Institute, Dec 5, 2006

UM Cancer Progression Metastasis Program Seminar, Dec 13, 2006

University Minnesota – Duluth, Jan 29, 2007

Dartmouth Medical Center, Jan 30, 2007

Session Chair, 2nd Zebrafish Investigators Workshop, Tools, Resources and Needs of the Zebrafish Community/Genome, Feb 2007

“P53 Activation by Sequence-Specific Knockdown Technologies”

International Life Sciences Institute – Workshop Invited Speaker, Research Triangle Park, North Carolina – Feb 27-28, 2007

University of Missouri, Columbia – March 20, 2007

Vascular Biology of the Liver Symposium, Atlanta, June 2-4 2007

Gordon Conference invited speaker – Elastin and Elastic Fibers, University of New England (Biddeford, ME) July 29-Aug 3, 2007.

2008 Keystone Symposium on Wnt/beta-Catenin Signaling in Development and Disease – Feb 17-22, 2008

6th International Conference on Transposition and Animal Biotechnology, June 19-21, 2008, Berlin, Germany

“The Ups and Downs of Gene-Breaking: Transposon-based Conditional Gene Regulation”

India Science Outreach Presentation. Hyderabad, India. September 26, 2008
“Know Your Genome”

HUGO's 13th Annual Meeting, HGM2008, Hyderabad, India. September 29, 2008
Session Chair: Genomics of Model Organisms
“Zebrafish Behavioral Genetics of Nicotine Dependency”

Model Organism Workshop, Bangalore, India. October 1, 2008

Sanger Centre, Zebrafish Knockout Project: Organization and Strategy Meeting, Hinxton, UK. March 7-9, 2009. Session chair: insertional Mutagenesis.
“Conditional Regulation of Gene-break Transposon (GBT)-induced Mutations”

University of Minnesota - Cancer Center and TTURC seminar program. Dec. 12, 2008

Hormel Institute, April 24, 2009, Austin, MN
“bette davis, humphrey bogart and the Genetics of Nicotine Dependency”

National Institutes of Health, June 3, 2009, Bethesda, MD
“bette davis, humphrey bogart and the Genetics of Nicotine Dependency”

University of Wisconsin (College of Pharmacy) December 11, 2009, Madison, WI
“bette davis, humphrey bogart and the Genetics of Nicotine Dependency”

Zebrafish Phenome Meeting, March 2010, NIH; SCE presentation and chair of insertional mutagenesis breakout session

University of Minnesota, Faculty Forum and Panelist, Scholarly Publishing and Scholarly Values: Choosing our Future

New Pathways to Future Addiction Therapy Workshop invited speaker, College on Problems of Drug Dependence (CPDD), June 12-17, 2010, Scottsdale, Arizona
“Identification of Unanticipated Nicotine Response Genes Using Zebrafish”

4th Angiogenesis Symposium, August 27-29, 2010, Mackinac Island, MI

AAAS, Oct 2010
“Modeling nicotine-induced conditioned place preference in larval zebrafish”

Frontiers in Addiction Research - NIDA mini-convention, Nov 12-17, 2010, San Diego, CA
“The GABAB Receptor: Identification of Unexpected Nicotine Response Genes Using Zebrafish”

Toronto Functional Genomics Meeting, Feb 7, 2011, Toronto, Ontario
“Protein Trap Gene-Breaking Transposons for Zebrafish Mutagenesis”

AAAS Annual Meeting, Feb 17-21, 2011, Washington, DC

NIDA Genetics of Addiction Webinar, June 6, 2011

International Genome Engineering Conference, June 20-22, 2011, Biopolis, Singapore
“*in vivo* Protein Trapping Produces a Functional Expression Codex of the Vertebrate Proteome”

Teratology Society annual meeting, EPA invited Keynote Speaker, June 25-29, 2011, San Diego, CA

“Overview of Zebrafish as an Experimental Model System”

Seminar at Carleton College, Jan 23, 2012, Northfield, MN

“InSciEd Out Zebrafish Molecular Genetics in the 21st Century”

University of Minnesota - Duluth, March 2, 2012, Duluth, MN

“InSciEd Out Zebrafish Molecular Genetics in the 21st Century”

University of Wisconsin-Milwaukee, Midwest Area Zebrafish Interest Group, April 2, 2012, Milwaukee, WI

“go fish!”

University of Wisconsin-Milwaukee, SEPA conference Keynote speaker, April 3, 2012

“Turning Science Education InSciEd Out”

Experimental Biology 2012, April 21-25, 2012, San Diego, CA

“Go Fish!”

FASEB Imaging-Based Phenotypic Analysis Symposium Invited Speaker, April 22, 2012

Seminar at Boston University, Pharmacology, May 23, 2012, Boston, MA

“InSciEd Out Zebrafish for Molecular and Chemical Genetics of Smoking Cessation”

10th International Conference Zebrafish Development and Genetics, June 20-24, 2012, Madison, WI

University Wisconsin Eau Claire, October 4, 2012

Case Western Reserve, student invited speaker, October 10, 2012, Cleveland, OH

“InSciEd Out Zebrafish Molecular Genetics”

HHMI Janella Farm Zebrafish Workshop, Nov 1-2, 2012; Ashburn, VA

Session Chairs (Site-specific genome modification I, II)

“Zebrafish genome editing using random and targeted engineering approaches”

3rd CSIR-Mayo Clinic Joint Workshop, Nov 6-10, 2012, Delhi, India

5th Strategic Conference of Zebrafish Investigators-Asilomar, January 19-23, 2013, Pacific Grove, CA

“Zebrafish Genome Editing Using Random and Targeted Engineering Approaches”

University of Kentucky, student invited speaker, Feb 6-7, 2013

“Go fish! – InSciEd Out Zebrafish Molecular Genetics”

Mayo Clinic Cancer Center Cell Biology Seminar, Rochester, MN, Feb 18, 2013

“Zebrafish for Precision Medicine from Designer Genomics to Personalized

Therapeutics?”

2013 NIH National Predoctoral Programs Meeting, Mayo Clinic, Keynote speech, May 6, 2013, Rochester, MN

“Time Machine InSciEd Out”

Katholic University of Leuven, Seminar, May 23, 2013, Leuven, Belgium

“Engineering the Zebrafish Genome – go fish!”

15th IBANGS Conference, May 20-24, 2013, Leuven, Belgium

“Zebrafish Genome Editing Using Random and Targeted Engineering approaches for Behavioral and Addiction Genetics Applications”

Midwest Zebrafish Conference, June 30-July 3, 2013, Milwaukee, WI

“Go Fish!: Designer Genes”

Zebrafish Marine Biology Labs Course, August 7-8, 2013, Woods Hole, MA

“TALEN Pit Talk”

First Zebrafish Personalized/Precision Medicine Conference, Toronto, Oct 16-18, 2013

“Zebrafish Genome Editing Tools Using Random and Targeted Engineering for Individualized Medicine Applications”

HHMI/Janelia Farm Zebrafish Workshop, November 3-5, 2013, Ashburn, VA

“Exploring the Vertebrate Proteome Using Gene-Breaking Transposons in Zebrafish”

Lombardi Comprehensive Cancer Center, Georgetown University Medical Center, student invited speaker, Feb 21, 2014, Washington, DC

“Zebrafish Genome Editing Tools Using Random and Targeted Engineering for Individualized Medicine”

Genome Engineering – Cutting Edge Research - FASEB, June 22-27, 2014, Nassau, Bahamas

“Zebrafish Genome Editing Tools Using Random and Targeted Engineering for Individualized Medicine Applications”

Zebrafish Disease Models Society Conference, invited speaker, June 28-July 1, 2014, Madison, WI

“Zebrafish Genome Editing Tools Using Random and Targeted Engineering for Individualized Medicine Applications”

Marine Biology Labs Course, August 12-14, 2014, Woods Hole, MA

“Reverse Genetics in Zebrafish”

6th Mayo Clinic Angiogenesis and Tumor Microenvironment Symposium, August 22-24, 2014, Rochester MN

“Genome Engineering Tools”

International Undiagnosed Disease Network inaugural meeting, Rome, Sept 29-30, 2014

“Functional Interpretation of Genetic Variation”

12th Transgenic Technology Conference, Oct 6-8, 2014 Edinburgh, Scotland

“The Zebrafish Molecular Genetic Programming Toolbox”

Workshop: An Introduction to Zebrafish Transgenesis, Oct 9, 2014, Edinburgh, Scotland

“Cre recombinase-reversible gene-breaking transposon mutagenesis”

American Society for Human Genetics, Zebrafish Models Workshop, Oct 18-22, 2014. San Diego, CA

Invited Session: “Using Zebrafish to Model Human Genetic disease Variation”

University of Minnesota, PharmacoNeuroimmunology Training grant seminar, Nov 3, 2014, Minneapolis, MN

“A Healthier Community Through Smoking fish, Gene surgery, and InSciEd Out”

5th Xiamen Winter Symposium, Dec 7-9, 2014, Xiamen, China

“The Science of Engineering Zebrafish Genomes”

Seminar University of Hong Kong, Dec 11, 2014, Hong Kong

“The Zebrafish Molecular Genetic Programming Budget Toolbox for Individualized Medicine”

6th Strategic Conference of Zebrafish Investigators, Asilomar, CA; Jan 20, 2015

“The Zebrafish Genome Editing Toolkit for Precision Medicine”

16th Australia and New Zealand Zebrafish Meeting, plenary speaker, Feb 6-10, 2015

“Surfing the Wave of Precision Medicine Using Zebrafish”

Mayo Clinic, Department Immunology, Mar 12 2015, Rochester, MN

“The Art and Engineering of DNA Surgery”

Fourth North Atlantic Zebrafish Research Symposium, June 8, 2015; Halifax, Nova Scotia, Keynote Speaker

“The Science of Engineering the Genome”

Marriott Collaborative Meeting, July 23, 2015, MGH, Boston, MA

“Zebrafish for Mitochondrial Disease Drug Discovery”

Second Zebrafish Personalized/Precision Medicine Conference, Sept 23-26, 2015, Toronto, Ontario

“The Science of Engineering the Genome”

Conference on Transposition and Genome Engineering, Nov 17-20, 2015, Nara, Japan - Session Chair

“Cure Mapping for Individualized Medicine”

National Institute of Genetics Symposium, Nov 24, 2015, Mishima, Japan – Speaker
“Cure Mapping for Individualized Medicine”

International Undiagnosed and Rare Disease Network invited Speaker - Feb 18-20,
2016, Vienna, Austria
“What about the Other 75%? Innovating the Boundaries to Address the Undiagnosed
Odysseys”

12th Annual Zebrafish Husbandry Workshop, Keynote speaker, Feb 23-25, 2016, Las
Vegas, NV
“Cure Mapping Using Zebrafish”

Seminar at Iowa State University, Student Invited Speaker - April 8, 2016, Ames, IA
“Cure Mapping and InSciEd Out”

Translational Science 2016, American Society Translational Sciences, Invited Speaker
- April 13-15, 2016, Washington, DC
“Reverse Engineering Success for your Post-PhD Career: an IDP for TL1 Trainees”

Genome Engineering – Cutting Edge Research and Applications, FASEB Genome
Engineering Meeting, June 5-9, 2016, Lisbon, Portugal, Oral Presentation
“Programming the Third Genome through Mitochondrial DNA Editing”

IEEE Young Professionals Development Presentation on Entrepreneurship, Sept29,
2016, Rochester, MN
Angling for Entrepreneurs: Filling the Walleye Tank”

Seminar at Beijing Genomics Institute, Oct 10, 2016, Shenzhen, China
“A Fish Tale: Cure Mapping”

Seminar at University of North Dakota Oct 21, 2016, Grand Forks, ND
“How to Join the Genome Writers Guild”

Alexion Pharmaceuticals, Webinar - Nov 2016
“Health Engineering French Canadian Leigh Syndrome Using Zebrafish”

7th Strategic Conference of Zebrafish Investigators, Jan 14-18, 2017, Pacific Grove, CA
Co-Chair, Gene Editing Workshop

HudsonAlpha Research Seminar, Mar 1, 2017, Huntsville, AL, Invited speaker
“How to Join the Genome Writers Guild”

CSIR/IGIB Gene Editing Workshop, Delhi India
Seminar “How to Join the Genome Writers Guild” Mar 22 2017
Workshop presentation: “Beyond MMEJ and HR” Mar 23 2017

Society for Developmental Biology West Coast Meeting, Mar 28-31, 2017, Yosemite, CA Invited Speaker and Chair, Education session "Science Education and Your Community"

Translational Science, Association for Clinical and Translational Science, Annual Meeting, April 19-21, Washington, DC
Innovation in entrepreneurship talk "Angling for Entrepreneurs: Filling the Walleye Tank"

R & D Systems, Bio-Techne, May 8, 2017; Minneapolis, MN
"How to Join the Genome Writers Guild"

Midwest Zebrafish Conference, Keynote speaker, June 16 2017; Cincinnati, OH
"Modifying the power house of the cell"
Workshop presentation – "Beyond NEHJ and HR" June 17 2017

Polycystic Kidney Disease: Challenges, Differing Viewpoints and Ways Forward, FASEB Conference, Keynote Speaker, June 25-30, 2017, Big Sky, Montana
"How to Join the Genome Writers Guild"

"Modifying the power house of the cell", Realizing the Future: Genome Engineering, Genome Writers Guild Conference 2017, July 13-15, 2017, Minneapolis, MN;

5th Conference of Undiagnosed Disease Network International, Aug 30-31, 2017, Stockholm, Sweden

NIH Health and Husbandry Workshop, organizer and speaker, Sept 2017

Third Zebrafish Personalized/Precision Medicine Conference, Toronto, Sept, 2017
"Engineering the powerhouse of the cell"

5th Chinese Zebrafish Research Conference Nov 1, 2017
"Engineering the powerhouse of the cell"

Seminar at Shuzhou University, Nov 2, 2017
"Zebrafish as a Discovery Platform"

Mayo Clinic Neuroscience Oncology Summit, Orlando, FL; Dec 14-15, 2017
"How to Join the Genome Writers Guild"

U MN BICB Keynote speaker - Jan 12, 2018, Rochester, MN
"How to Join the Genome Writers Guild"

Center for Orphan Diseases, Invited Seminar, UM, Minneapolis, 2018

U MN Chemical Biology Colloquium series invited seminar. April 9, 2018. U MN, Minneapolis.

"Beyond NHEJ/HR: precision deletions and integrations by harnessing diverse DNA

repair pathways for gene editing”, 3rd Annual meeting of the Japanese Society for genome editing- invited speaker; Hiroshima, Japan; Jun 18-20, 2018.

2nd Genome Writers Guild Conference, Session Chair, July 21 2018

Oklahoma Medical Research Foundation Sept 13 2018

Mayo Clinic New Frontiers in Mitochondrial Disorders, Sept 21 2018

NIH Gene Editing Consortia Meeting, Dec 9-10, 2018 – Editing Mitochondria DNA and RNA

“PReMA Alleles for Functional Genomics Science in Zebrafish”, Strategic Conference of Zebrafish Investigators – Oral Presentation; Gene Editing Workshop Chair, Asilomar CA, Jan 12-18, 2019

Zebrafish Disease Models Society Conference invited speaker – July 15-18, 2019, Boston, MA

NOTE: Incomplete starting summer 2019

“Location, location, location! MMEJ real estate for functional genomics in zebrafish”, The 12th Zebrafish Disease Models Conference, Boston, MA, July 15-18, 2019

“mtDNA Editing”, Marriott Mitochondrial Disorders Collaborative Research Network Summer Meeting, Boston, Massachusetts, July 17-18, 2019

“Location, location, location! MMEJ real estate for functional genomics in zebrafish”. 14th International Zebrafish Conference, Suzhou, China, Aug 12-16, 2019.

“How to Join the Genome Writers Guild”, ARRIGE (Association for Responsible Research and Innovation in Genome Editing), Paris, France, Nov 13-14, 2019.

Leader Launch at the Mayo Clinic, 2019 Rosalind Franklin Society Colloquium and Board Meeting, Philadelphia, Pennsylvania, Nov 20-21, 2019.

"Bench to Business to Bedside - Accelerating life science translation via commercialization" 2020 Mayo - Karolinska Institute Annual Meeting Educations Sessions, Sept 9, 2020.

“Precision Genome Engineering Using Donor Guides”, Invited Oral Presentation at The Frontier Development Program for Genome Editing, , International Symposium AY2020: Front-line of genome Editing Technology, March 6, 2021, Hiroshima University

19th Annual Data and Dine, Pennsylvania State University – Invited Oral Presentation “The 3B Model of Translation: How to Create Your Own Future”, April 16, 2021

Genome Writers Guild, July 2021

“Mayo Clinic – CcaTS Office of Entrepreneurship. Empowering a culture of innovation and entrepreneurship through education”, Mayo Clinic Symposium on Regenerative Medicine & Surgery 2021, Phoenix, AZ Nov 4-7, 2021

“Engineering the Intracellular Microbiome. Lessons from Zebrafish” WELLCOME GENOME Mitochondrial Medicine Therapeutic Development Conference on December 2, 2021

“Mayo Clinic – CcaTS Office of Entrepreneurship. Empowering a culture of innovation and entrepreneurship through education”
Invited oral presentation, Mayo Clinic Symposium on Regenerative Medicine & Surgery 2021, Phoenix, AZ, Nov 4-7, 2021.

"Pioneering Precision in Gene Editing Using Pisces" VII Brazilian Zebrafish Symposium, Brazil, Nov 18-19, 2021.

Opening Remarks, Minnesota NeuroSpin Initiative's Inaugural Workshop, University of MN, Minneapolis, MN, Dec 7, 2021.

Research Publications

1. **Ekker SC**, Young KE, von Kessler DP, and Beachy PA. (1991). Optimal DNA Sequence Recognition by the *Ultrabithorax* Homeodomain of *Drosophila*. *EMBO J*, 1991 May;**10**(5):1179-1186. PMID: PMC452771.
2. **Ekker SC**, von Kessler DP, and Beachy PA. (1992). Differential DNA Sequence Recognition is a Determinant of Specificity in Homeotic Gene Action. *EMBO J*, 1992 Nov;**11**(11): 4059-4072. PMID: PMC556916.
3. Beachy PA, Varkey J, Young KE, von Kessler DP, Sun BI, and **Ekker SC**. (1993). Cooperative Binding of an *Ultrabithorax* Homeodomain Protein to Nearby and Distant DNA Sites. *Mol Cell Bio*, 1993 Nov;**13**(11): 6941-6956. doi: 10.1128/mcb.13.11.6941. PMID: PMC364756.
4. **Ekker SC**, Jackson DG, von Kessler DP, Sun BI, Young KE, and Beachy PA. (1994). The Degree of Variation in DNA Sequence Recognition Among Four *Drosophila* Homeotic Proteins. *EMBO J*, 1994 Aug1;**13**(15): 3551-3560. PMID: PMC395259.
5. Lee JJ, **Ekker SC**, von Kessler DP, Porter JA, Sun BI, Beachy PA. (1994) Autoproteolysis in *hedgehog* Protein Biogenesis. *Science*, 1994 Dec 2;**266**(5190): 1528-1537. doi: 10.1126/science.7985023.
6. Porter JA, von Kessler DP, **Ekker SC**, Young KE, Moses K, and Beachy PA. (1995). The Product of *hedgehog* Autoproteolytic Cleavage Active in Local and Long-range Signalling. *Nature*, 1995 Mar 23;**374**(6520):363-366. doi: 10.1038/374363a0.
7. **Ekker SC**, McGrew LL, Lai C-J, Lee JJ, von Kessler DP, Moon RT, and Beachy PA. (1995). Distinct Expression and Shared Activities of Members of the *hedgehog* Gene Family of *Xenopus laevis*. *Development*, 1995 Aug;**121**(8):2337-234
8. Lai C-J, **Ekker SC**, Beachy PA, and Moon RT. (1995). Patterning of the Neural Ectoderm of *Xenopus laevis* by the Amino Terminal Product of *hedgehog* Autoproteolytic Cleavage. *Development*, **121**: 2349-2360.
9. **Ekker SC**, Ungar A, Greenstein P, von Kessler DP, Porter JA, Moon RT, and Beachy PA (1995). Patterning Activities of Vertebrate *hedgehog* Proteins in the Developing Eye and Brain. *Curr Biol*, 1995 Aug 1;**5**(8):944-955. doi: 10.1016/s0960-9822(95)00185-0.
10. Porter JA, **Ekker SC**, Park W-J, von Kessler DP, Young KE, Chen C-H, Woods AS, Ma Y, Cotter RJ, Koonin EV, Beachy PA. (1996) Hedgehog Patterning Activity: Role of a Lipophilic Modification Mediated by the Carboxy-Terminal Autoprocessing Domain. *Cell*, 1996 Jul12;**86**(1):21-34. doi: 10.1016/s0092-8674(00)80074-4.
11. Nasevicius A, Hyatt T, Kim H, Guttman J, Walsh E, Sumanas S, Wang Y and **Ekker SC**. (1998) Evidence for a *frizzled*-Mediated *wnt* Pathway Required for Zebrafish Dorsal Mesoderm Formation. *Development*, 1998 Nov;**125**(21):4283-4292.
12. Nasevicius A, Hyatt T, Hermanson S, and **Ekker SC**. (2000) Sequence, Expression and Location of Zebrafish *frizzled 10*. *Mech Dev*, 2000 Apr;**92**(2):311-314. doi: 10.1016/s0925-4773(00)00244-6.
13. Sumanas S, Strege P, Heasman J, and **Ekker SC**. (2000) The Putative Wnt Receptor *Xenopus frizzled-7* Functions Upstream of Beta-Catenin in Vertebrate Dorsoventral Mesoderm Patterning. *Development*, 2000 May;**127**(9):1981-1990.
14. Nasevicius A and **Ekker SC**. (2000) Effective Targeted Gene 'Knockdown' in Zebrafish. *Nature Genet*, 2000 Oct;**26**(2):216-220. doi: 10.1038/79951.
Nature Genetics Editorial
News and Views – Nature Neuroscience
Faculty of 1000 Review
Patent issued
15. Nasevicius A, Larson J, and **Ekker SC**. (2000) Distinct Requirements for Zebrafish Angiogenesis Revealed by a *VEGF-A* Morphant. *Yeast*, 2000 Dec;**17**(4):294-301. doi: 10.1002/1097-0061(200012)17:4<294::AID-YEA54>3.0.CO;2-5. PMID: PMC2448381.
16. Ross JJ, Shimmi O, Vilmos P, Petryk A, Kim H, Gaudenz K, Hermanson S, **Ekker SC**,

- O'Connor MB, Marsh JL. (2001) Twisted Gastrulation is a Conserved Extracellular BMP Antagonist. *Nature*, 2001 Mar;**410**(6827):479-483. doi: 10.1038/35068578.
17. Sumanas S and **Ekker SC**. (2001) *Xenopus frizzled-5*: a *frizzled* Family Member Expressed Exclusively in the Neural Retina of the Developing Eye. *Mech Dev*, 2001 May;**103**(1-2):133-136. doi: 10.1016/s0925-4773(01)00327-6.
18. Finley K, Davidson A, and **Ekker SC**. (2001) Three-Color Imaging Using Fluorescent Proteins in Living Zebrafish Embryos. *Biotechniques*, 2001 Jul;**31**(1):66-72. doi: 10.2144/01311st02.
19. The following papers (19-23) were published as a part of the special issue of the journal *genesis* devoted to morpholino knockdowns, with the last (Ekker and Larson, 2001) the lead review article for the issue.

Cover Art for this issue



20. Sumanas S and **Ekker SC**. (2001) *Xenopus frizzled-7* Morphant Displays Defects in Dorsoventral Patterning and Convergent Extension Movements During Gastrulation. *Genesis*, 2001 Jul;**30**(3):119-122. doi: 10.1002/gene.1044.
21. Sumanas S, Kim H, Hermanson S, and **Ekker SC**. (2001) Zebrafish *frizzled-2* Morphant Displays Defects in Body Axis Elongation. *Genesis*, 2001 Jul;**30**(3):114-118. doi: 10.1002/gene.1043.
22. Etheridge LA, Wu T, Liang J, **Ekker SC**, and Halpern ME. (2001). Floor Plate Develops Upon Depletion of *Tiggy-winkle* and *Sonic Hedgehog*. *Genesis*, 2001 Jul;**30**(3):164-169. doi: 10.1002/gene.1056.
23. Klee EW, **Ekker SC**, and Ellis LBM. (2001) Target Selection for *Danio rerio* Functional Genomics. *Genesis*, 2001 Jul;**30**(3):123-125. doi: 10.1002/gene.1045.
24. Bingham S, Nasevicius A, **Ekker SC**, Okamoto H, and Chandrasekhar A. (2001) *Sonic hedgehog* and *tiggy-winkle hedgehog* Cooperatively Induce Zebrafish Branchiomotor Neurons. *Genesis*, 2001 Jul;**30**(3):170-174. doi: 10.1002/gene.1057. PMID: PMC2810144.
25. Dupuy AJ, Clark K, Carlson CM, Fritz S, Davidson AE, Markley KM, Finley K, Fletcher CF, **Ekker SC**, Hackett PB, Horn S, and Largaespada DA. (2002) Mammalian Germ-line Transgenesis by Transposition. *Proc Natl Acad Sci U S A*, 2002 Apr 2;**99**(7):4495-4499. doi: 10.1073/pnas.062630599. Epub 2002 Mar 19. PMID: PMC123676.
26. Sumanas S, Kim H, Hermanson S, and **Ekker SC**. (2002) Lateral Line, Nervous System, and Maternal Expression of *Frizzled 7a* During Zebrafish Embryogenesis. *Mech Dev*, 2002 Jul;**115**(1-2):107-111. doi: 10.1016/s0925-4773(02)00084-9.
27. Davidson A, Balciunas D, Mohn D, Shaffer J, Hermanson S, Sivasubbu S, Cliff MP, Hackett PB, and **Ekker SC**. (2003) Efficient Gene Delivery and Gene Expression in Zebrafish Using the *Sleeping Beauty* Transposon. *Dev Biol*, 2003 Nov 15;**263**(2):191-202. doi: 10.1016/j.ydbio.2003.07.013.
News and views: http://www.obgyn.net/newsheadlines/headline_medical_news-Gene_Transfer-20031229-3.asp
28. Chen E, Hermanson S, and **Ekker SC**. (2004) Syndecan-2 is Essential for Angiogenic Sprouting During Zebrafish Development. *Blood*, 2004 Mar 1;**103**(5):1710-9. doi: 10.1182/blood-2003-06-1783. [Epub 2003 Oct 30].

Faculty of 1000 Review

Patent issued

29. Klee EW, Carlson DF, Fahrenkrug SC, **Ekker SC**, and Ellis LBM. (2004) Identifying Secretomes in People, Pufferfish, and Pigs. *Nucleic Acids Res*, 2004 Feb 27;**32**(4):1414-1421. doi: 10.1093/nar/gkh286. Print 2004. Epub 2004 Feb 27].
30. Pickart MA, Sivasubbu S, Nielsen AL, Shiram S, King RA, and **Ekker SC**. (2004) Functional Genomics Tools for the Analysis of Zebrafish Pigment. *Pigment Cell Res*. 2004 Oct;**17**(5):461-470. doi: 10.1111/j.1600-0749.2004.00189.x.
31. Larson JD, Wadman SA, Chen E, Kerley L, Clark KJ, Eide M, Lippert S, Nasevicius A, **Ekker SC**, Hackett PB, and Essner JJ. (2004) Expression of VE-Cadherin in Zebrafish Embryos: A New Tool to Evaluate Vascular Development. *Dev Dyn*, 2004 Sep;**231**(1):204-13. doi: 10.1002/dvdy.20102.
32. Balciunas D, Davidson AE, Sivasubbu S, Hermanson S, Welle Z, and **Ekker SC**. (2004) Enhancer Trapping in Zebrafish Using the *Sleeping Beauty* Transposon. *BMC Genomics*, 2004 Sep 3;**5**(1):62. doi: 10.1186/1471-2164-5-62. PMID: PMC520745 Epub 2004 Sep 03
Highly accessed
33. Leung AYH, Mendenhall EM, Kwan TTF, Liang R, Eckfeldt C, Chen E, Hammerschmidt M, Grindle S, **Ekker SC**, and Verfaillie CM. (2005) Characterization of Expanded Intermediate Cell Mass (ICM) in Zebrafish Chordin Morphant Embryos. *Dev Biol*, 2005 Jan 1;**277**(1):235-254. doi: 10.1016/j.ydbio.2004.09.032.
34. Chen E, Stringer S, Rusch M, Selleck S, and **Ekker SC**. (2005) A Unique Role for 6-O Sulfation in Zebrafish Vascular Remodeling. *Developmental Biology*, **284**, 364-376.
35. Klee E, Shim K, Pickart M, **Ekker SC**, and Ellis L. (2005) AMOD: A Morpholino Oligonucleotide Selection Tool. *Nucleic Acids Research*. **33**, W506-W511.
36. Eckfeldt CE, Mendenhall EM, Flynn CM, Wang T-F, Pickart MA, Grindle SM, **Ekker SC**, and Verfaillie CM. (2005) Functional Analysis of Human Hematopoietic Stem Cell Gene Expression Using Zebrafish. *PLoS Biol*, 2005 Aug;**3**(8):e254. PMID: PMC1166352. doi: 10.1371/journal.pbio.0030254. Epub 2005 Jul 5.
PLoS editorial: PLoS Biol. 2005 August; **3**(8): e279.
<http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1166354>
News article Science Daily:
<http://www.sciencedaily.com/releases/2005/07/050710195643.htm>
37. Wilber AC, Frandsen JL, Wangenstein KJ, **Ekker SC**, Wang X, and McIvor RS. (2005) Dynamic Gene Expression After Systemic Delivery of Plasmid DNA as Determined by *In vivo* Bioluminescence Imaging. *Hum Gene Ther*, 2005 Nov;**16**(11):1325-1332. doi: 10.1089/hum.2005.16.1325.
38. Kim HJ, Schleiffarth JR, Jessurun J, Sumanas S, Petryk A, Lin S, and **Ekker SC**. (2005) Wnt5 Signaling in Vertebrate Pancreas Development. *BMC Biol*, 2005 Oct 24;**3**:23. doi: 10.1186/1741-7007-3-23. PMID: PMC1276788.
<http://www.biomedcentral.com/1741-7007/3/23>
'Highly Accessed' journal citation
Faculty of 1000 Reviewed
39. Ohlfest JR, Demorest ZL, Motooka Y, Vengco I, Oh S, Chen E, Scappaticci FA, Saplis RJ, **Ekker SC**, Low WC, Freese AB, and Largaespada DA. (2005) Combinatorial Antiangiogenic Gene Therapy by Nonviral Gene Transfer Using the *Sleeping Beauty* Transposon Causes Tumor Regression and Improves Survival in Mice Bearing Intracranial Human Glioblastoma. *Mol Ther*, 2005 Nov;**12**(5):778-788. Epub 2005 Sep 16. doi: 10.1016/j.ymthe.2005.07.689.
Cover article.
40. Kwan TT, Liang R, Verfaillie CM, **Ekker SC**, Chan LC, Lin S, Leung AYH. (2006) Regulation of Primitive Hematopoiesis in Zebrafish Embryos by the Death Receptor Gene. *Exp Hematol*, 2006 Jan;**34**(1):27-34. doi: 10.1016/j.exphem.2005.09.017.

41. Chen E, Larson J, and **Ekker SC**. (2006) Functional Analysis of Zebrafish Microfibril-Associated Glycoprotein-1 (MAGP1) In Vivo Reveals Roles for Microfibrils in Vascular Development and Function. *Blood*, 2006 Jun 1;**107**(11):4364-74. doi: 10.1182/blood-2005-02-0789. Epub 2006 Feb 9. PMID: PMC1895789.
<http://www.bloodjournal.org/cgi/content/abstract/2005-02-0789v1?etoc>
Inside Blood News and Views:
<http://www.bloodjournal.org/cgi/content/full/107/11/4202?etoc>
42. Sivasubbu S, Balciunas D, Davidson AE, Pickart MA, Hermanson SB, Wangensteen KJ, Wolblink DC, and **Ekker SC**. (2006) Gene-breaking Transposon Mutagenesis Reveals an Essential Role for Histone H2afza in Zebrafish Larval Development. *Mech Dev*, 2006 Jul;**123**(7):513-29. doi: 10.1016/j.mod.2006.06.002. Epub 2006 Jun 9.
43. Pickart MA, Klee EW, Nielsen AL, Sivasubbu S, Mendenhall EM, Bill B, Chen E, Eckfeldt CE, Knowlton M, Robu ME, Larson JD, Deng Y, Schimmenti LA, Ellis LBM, Verfaillie CM, Hammerschmidt M, Farber SA, and **Ekker SC**. (2006) Genome-wide Reverse Genetics Framework to Identify Novel Functions of the Vertebrate Secretome. *PLoS One*, 2006 Dec 20;**1**(1):e104. doi: 10.1371/journal.pone.0000104. PMID: PMC1766371.
44. Balciunas D, Wangensteen KJ, Wilber A, Bell J, Geurts A, Sivasubbu S, Wang X, Hackett PB, Largaespada DA, Mclvor RS, and **Ekker SC**. (2006) Harnessing a High Cargo-Capacity Transposon for Genetic Applications in Vertebrates. *PLoS Genet*, 2006 Nov 10;**2**(11):e169. doi: 10.1371/journal.pgen.0020169. Epub 2006 Aug 28. PMID: PMC1635535.
<http://www.plosgenetics.org/article/info%3Adoi%2F10.1371%2Fjournal.pgen.0020169>
Research Highlights: Nature Medicine
<http://www.nature.com/nmeth/journal/v4/n1/full/nmeth0107-10.html>
45. Patterson LJ, Gering M, Eckfeldt CE, Green AR, Verfaillie CM, **Ekker SC**, and Patient R. (2007) The Transcription Factors, Scl and Lmo2, Act Together During Development of the Haemangioblast in Zebrafish. *Blood*, 2007 Mar 15;**109**(6):2389-2398. doi: 10.1182/blood-2006-02-003087. Epub 2006 Nov 7.
46. Schleiffarth JR, Person AD, Martinsen BJ, Sukovich DJ, Neumann A, Baker CVH, Lohr JL, Cornfield DN, **Ekker SC**, and Petryk A. (2007) Wnt5a is Required for Cardiac Outflow Tract Septation in Mice. *Pediatr Res*, 2007 Apr;**61**(4):386-91. doi: 10.1203/pdr.0b013e3180323810.
Cover article.
47. Wilber A, Wangensteen KJ, Chen Y, Zhuo L, Frandsen JL, Bell J, Chen ZJ, **Ekker SC**, Mclvor RS, and Wang X, (2007) Messenger RNA as a Source of Transposase for *Sleeping Beauty* Transposon-Mediated Correction of Hereditary Tyrosinemia Type I. *Mol Ther*, 2007 Jul;**15**(7):1280-1287. doi: 10.1038/sj.mt.6300160. Epub 2007 Apr 17.
48. Robu ME, Larson JD, Nasevicius A, Beiraghi S, Brenner C, Farber SA, and **Ekker SC**. (2007) p53 Activation by Knockdown Technologies. *PLoS Genet*, 2007 May 25;**3**(5):e78. doi: 10.1371/journal.pgen.0030078. Epub 2007 Apr 10. PMID: PMC1877875.
<http://genetics.plosjournals.org/perlserv/?request=get-document&doi=10.1371/journal.pgen.0030078>
Editor's pick, May 2007; 'Most viewed' article, May, 2007
Faculty of 1000 Reviews [2]
49. Alvarez Y, Cederlund ML, Cottell DC, Bill BR, **Ekker SC**, Torres-Vasquez J, Weinstein BM, Hyde DR, Vihtelic TS, and Kennedy BN. (2007) Genetic Determinants of Hyaloid and Retinal Vasculature in Zebrafish. *BMC Dev Biol*, 2007 Oct 15;**7**:114. doi: 10.1186/1471-213X-7-114. PMID: PMC2169232.
50. Wang L, Dutta SK, Kojima T, Xu X, Kosravi-Far R, **Ekker SC**, and Mukhopadhyay D. (2007) Neuropilin-1 Modulates p53/Caspases Axis to Promote Endothelial Cell Survival. *PLoS One*, 2007 Nov 14;**2**(11):e1161. doi: 10.1371/journal.pone.0001161. PMID: PMC2048754.
51. Wangensteen KJ, Wilber A, Keng VW, He Z, Matise I, Wangensteen L, Carson CM, Chen

- Y, Steer CJ, McIvor RS, Largaespada DA, Wang X, and **Ekker SC**. (2008) A Facile Method for Somatic, Lifelong Manipulation of Multiple Genes in the Mouse Liver. *Hepatology*, 2008 May;47(5):1714-24. doi: 10.1002/hep.22195. PMID: PMC5808937
52. Knowlton MN, Li T, Ren Y, Bill B, Ellis LBM, and **Ekker SC**. (2008) A PATO-Compliant Zebrafish Screening Database (MODB): Management of Morpholino Knockdown Screen Information. *BMC Bioinformatics*, 2008 Jan 7;9:7. doi: 10.1186/1471-2105-9-7. PMID: PMC2221974
Highly Accessed
53. Bill BR, Balciunas D, McCarra JA, Young ED, Xiong T, Spahn AM, Garcia-Lecea M, Korzh V, **Ekker SC**, and Schimmenti LA. (2008) Development and Notch Signaling Requirements of the Zebrafish Choroid Plexus. *PLoS One* 2008 Sep 3;3(9):e3114. doi: 10.1371/journal.pone.0003114. PMID: PMC2528000.
<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0003114>
54. Shibasaki Y, Kim B-S, Young AJ, McLoon AL, **Ekker SC**, and Taton TA. (2009) Crosslinked, Glassy Styrenic Surfactants Stabilize Quantum Dots Against Environmental Extremes. *J Mater Chem*, 2009;19(35):6324-6327. doi: 10.1039/B902275A. Epub 2009 Jun 19. PMID: PMC5129847.
55. Petzold AM, Balciunas D, Sivasubbu S, Clark KJ, Bedell VB, Westcot SE, Myers SR, Moulder GL, Thomas MJ, and **Ekker SC**. (2009) Nicotine Response Genetics in the Zebrafish. *Proc Natl Acad Sci U S A*. 2009 Nov 3;106(44):18662-18667. doi: 10.1073/pnas.0908247106. Epub 2009 Oct 26. PMID: PMC19858493]
News and views:<http://www.pnas.org/content/106/44/18429.full>
Genome web: <http://www.genomeweb.com/blog/week-pnas-32>
56. Keng VW, Ryan BJ, Wangensteen KJ, Balciunas D, Schmedt C, **Ekker SC**, Largaespada DA. (2009) Efficient Transposition of Tol2 in the Mouse Germline. *Genetics*, 2009 Dec;183(4):1565-1573. Epub 2009 Oct 5. PMID: PMC2787440.
57. Person AD, Beiraghi S, Sieben CM, Hermanson S, Neuman AN, Robu ME, Schleiffarth JR, Billington CJ, van Bokhoven H, Hooqboom JM, Mazzeu JF, Petryk A, Schimmenti LA, Brunner HG, **Ekker SC**, and Lohr JL. (2010) Wnt5a Mutations in Patients with Autosomal Dominant Robinow Syndrome. *Dev Dyn*. 2010 Jan;239(1):327-337. PMID: PMC4059519.
58. Petzold AM, Bedell VM, Boczek NJ, Essner JJ, Balciunas D, Clark KJ, and **Ekker SC**. (2010) SCORE Imaging: Specimen in a Corrected Optical Rotational Enclosure. *Zebrafish*, 2010 Jun;7(2):149-154. doi: 10.1089/zeb.2010.0660. PMID: PMC3117241.
59. He Z, Zhang H, Zhang X, Xie D, Chen Y, Wangensteen KJ, **Ekker SC**, Firpo M, Liu C, Xiang D, Zi X, Hui L, Yang G, Ding X, Hu Y, Wang X. (2010) Liver Xeno-Repopulation with Human Hepatocytes in Fah^{-/-}Rag2^{-/-} Mice After Pharmacological Immunosuppression. *Am J Pathol*, 2010 Sep;177(3):1311-1319. doi: 10.2353/ajpath.2010.091154. Epub 2010 Jul 22. PMID: PMC2928964.
60. Huang X, Guo H, Tammana S, Jung Y-C, Mellgren E, Bassi P, Cao Q, Tu ZJ, Kim YC, **Ekker SC**, Wu X, Wang SM, Zhou X. (2010) Gene Transfer Efficiency and Genome-Wide Integration Profiling of *Sleeping Beauty*, *Tol2*, and *PiggyBac* Transposons in Human Primary T Cells. *Mol Ther*, 2010 Oct;18(10):1803-1813. doi: 10.1038/mt.2010.141. Epub 2010 Jul 6. PMID: PMC2951558.
61. Wang Y, Kaiser MS, Larson JD, Nasevicius A, Clark KJ, Wadman SA, Roberg-Perez SE, **Ekker SC**, Hackett PB, McGrail M, and Essner JJ. (2010) Moesin1 and Ve-cadherin are Required in Endothelial Cells During *in vivo* Tubulogenesis. *Development*, 2010 Sep;137(18):3119-3128. doi: 10.1242/dev.048785. PMID: PMC2926960.
62. Alexandre A, Alonzeau J, Bill BR, **Ekker SC**, Waschek JA. (2011) Expression Analysis of PAC1-R and PACAP Genes in Zebrafish Embryos. *J Mol Neurosci*. 2011 Jan;43(1):94-100. doi: 10.1007/s1203-010-9397-y. Epub 2010 Jun5. PMID: PMC3018597.
63. Buckley SM, Ulloa-Montoya F, Abts D, Oostendorp RAJ, Dzierzak E, **Ekker SC**, and Verfaillie CM. (2011) Maintenance of HSC by Wnt5a Secreting AGM-Derived Stromal Cell

- Line. *Exp Hematol*, 2011 Jan;**39**(1):114-123.e1-5. doi: 10.1016/j.exphem.2010.09.010. Epub 2010 Oct 7. PMID: PMC3031906.
64. Clark KJ, Balciunas D, Pogoda H-M, Ding Y, Westcot SE, Bedell VM, Greenwood TM, Urban MD, Skuster KJ, Petzold AM, Ni J, Nielsen AL, Patowary A, Scaria V, Sivasubbu S, Xu X, Hammerschmidt M, and **Ekker SC**. (2011) *In vivo* Protein Trapping Produces a Functional Expression Codex of the Vertebrate Proteome. *Nat Methods*, 2011 Jun;**8**(6):506-512. doi: 10.1038/nmeth.1606. Epub 2011 May 8. PMID: PMC3306164. <http://www.sciencedaily.com/releases/2011/05/110508134922.htm> http://www.minnpost.com/medcitynews/2011/05/10/28155/mayo_clinic_performs_a_genetic_feat_switches_zebrafish_genes_on_and_off <http://www.postbulletin.com/news/stories/display.php?id=1453928> <http://truthdive.com/2011/05/09/Holy-Grail-of-science-Mayo-clinic-turns-genes-off-and-on-in-zebrafish.html> <http://www.medindia.net/news/Mayo-Clinic-Can-Turn-Zebrafish-Genes-On-and-Off-84774-1.htm> http://www.mdnews.com/news/2011_05/mayo-clinic-turns-zebrafish-genes-off-and-on <http://eon.businesswire.com/news/eon/20110509006746/en> <http://www.bi-me.com/main.php?id=52572&t=1&c=129&cg=4&mset=1011> <http://www.medcitynews.com/2011/05/mayo-clinic-performs-a-genetic-feat-switches-zebrafish-genes-on-and-off/> http://www.eurekalert.org/pub_releases/2011-05/mc-ia050411.php https://sfari.org/toolbox/-/asset_publisher/Jb6r/content/new-tool-links-gene-to-function-in-zebrafish Nature Methods News and Views, Dr. Mary Mullins: <http://www.nature.com/nmeth/journal/v8/n6/full/nmeth.1617.html>
65. Ding Y, Sun X, Huang W, Hoage T, Redfield M, Kushwaha S, Sivasubbu S, Lin X, **Ekker SC**, and Xu X. (2011) Haploinsufficiency of Target of Rapamycin Attenuates Cardiomyopathies in Adult Zebrafish. *Circ Res*. 2011 Sep 2;**109**(6):658-669. doi: 10.1161/CIRCRESAHA.111.248260. Epub 2011 Jul 14. PMID: PMC3166359.
66. Ma ACH, Fung TK, Lin RHC, Chung MIS, Yang D, **Ekker SC**, and Leung AYH. (2011) Methionine Aminopeptidase 2 is Required for HSC Initiation and Proliferation. *Blood*, 2011 Nov 17;**118**(20):5448-5457. doi: 10.1182/blood-2011-04-350173. Epub 2011 Sep 21. PMID: PMC3342862.
67. Clark KJ, Argue DP, Petzold AM, **Ekker SC**. (2012) zfishbook: Connecting You to a World of Zebrafish Revertible Mutants. *Nucleic Acids Res*. 2012 Jan;**40**(Database issue):D907-911. doi: 10.1093/nar/gkr957. Epub 2011 Nov 8. PMID: PMC3245101.
68. Liao H-K, Wang Y, Noack Watt KE, Wen Q, Breitback J, Kemmet CK, Clark KJ, **Ekker SC**, Essner JJ, and McGrail M. (2012) Tol2 Gene Trap Integrations in the Zebrafish Amyloid Precursor Protein Genes *appa* and *aplp2* Reveal Accumulation of Secreted APP at the Embryonic Veins. *Dev Dyn*. 2012 Feb;**241**(2):415-425. doi: 10.1002/dvdy.23725. PMID: PMC3448447.
Cover Article
69. Bedell VM, Person AD, Larson JD, McLoon A, Balciunas D, Clark KJ, Neff KI, Nelson KE, Bill BR, Schimmenti LA, Beiraghi S, and **Ekker SC**. (2012) The Lineage-Specific Gene *ponzr1* is Essential for Zebrafish Pronephric and Pharyngeal Arch Development. *Development*. 2012 Feb;**139**(4):793-804. doi: 10.1242/dev.071720. PMID: PMC3265064.
70. Xu J, Gao J, Li J, Xue L, Clark KJ, **Ekker SC**, and Du SJ. (2012) Functional Analysis of Slow Myosin Heavy Chain 1 and Myomesin-3 In Sarcomere Organization in Zebrafish Embryonic Slow Muscles. *J Genet Genomics*. 2012 Feb;**39**(2):69-80. doi: 10.1016/j.jgg.2012.01.005. Epub 2012 Jan 21. PMID: PMC2971575.
Cover article. PubMed # 22361506 NIHMSID# 552448



71. McNulty MS, Bedell VM, Greenwood TM, Craig TA, **Ekker SC**, and Kumar R. (2012) Expression of *Sclerostin* in the Developing Zebrafish (*Danio rerio*) Brain and Skeleton. *Gene Expr Patterns*. Aug-Sep 2012;**12**(7-8):228-235. doi: 10.1016/j.gep.2012.04.003. Epub 2012 May 7. PMID: PMC3435489.
72. Craig TA, Zhang Y, McNulty MS, Middha S, Ketha H, Singh RJ, Magis AT, Funk C, Price ND, **Ekker SC**, and Kumar R. (2012) Research Resource: Whole Transcriptome RNA Sequencing Detects Multiple 1 α ,25-Dihydroxyvitamin D(3)-Sensitive Metabolic Pathways in Developing Zebrafish. *Mol Endocrinol*, 2012 Sep;**26**(9):1630-1642. doi: 10.1210/me.2012-1113. Epub 2012 Jun 25. PMID: PMC3434529.
73. Hoepfner LH, Phoenix KN, Clark KJ, Bhattacharya R, Gong X, Sciuto TE, Vohra P, Suresh S, Bhattacharya S, Dvorak AM, **Ekker SC**, Dvorak HF, Claffey KP, and Mukhopadhyay D. (2012) Revealing the Role of Phospholipase C β 3 in the Regulation of VEGF-induced Vascular Permeability. *Blood*, 2012 Sep 13;**120**(11):2167-2173. doi: 10.1182/blood-2012-03-417824. Epub 2012 Jun 6. PMID: PMC3447777.
Plenary Paper.
<http://bloodjournal.hematologylibrary.org/cgi/content/abstract/120/11/2167?etoc>
News and Views:
<http://bloodjournal.hematologylibrary.org/cgi/content/full/120/11/2162?etoc>
74. Hoffman SJ, Psaltis PJ, Clark KJ, Spoon DB, Chue CD, **Ekker SC**, and Simari RD. (2012) An *In Vivo* Method to Quantify Lymphangiogenesis in Zebrafish. *PLoS One*, 2012;**7**(9):e45240. doi:10.1371/journal.pone.0045240. Epub 2012 Sep 13. PMID: PMC3441694.
75. Bedell VM, Wang Y, Campbell JM, Poshusta TL, Starker CG, Krug RG, Tan W, Penheiter SG, Ma AC, Leung AYH, Fahrenkrug SC, Carlson DF, Voytas DF, Clark KJ, Essner JJ, and **Ekker SC**. (2012) *In vivo* Genome Editing Using a High Efficiency TALEN System. *Nature*, 2012 Nov1;**491**(7422):114-118. doi: 10.1038/nature11537. Epub 2012 Sep 23. PMID: PMC3491146
<http://www.nature.com/nature/journal/vaop/ncurrent/full/nature11537.html>
News and Views:
<http://www.nature.com/news/custom-gene-editing-rewrites-zebrafish-dna-1.11463>
<http://www.mayoclinic.org/news2012-rst/7093.html?rss-feedid=6>
<http://www.sciencedaily.com/releases/2012/09/120923141214.htm>
<http://www.kurzweilai.net/custom-gene-editing-rewrites-zebrafish-dna>
<http://www.sciencenewsline.com/articles/2012092402050003.html>
http://fishgenomes.blogspot.com/2012_09_01_archive.html
<http://medicalxpress.com/news/2012-09-toolkit-customizing-zebrafish-genomes.html>
http://www.silobreaker.com/researchers-develop-editing-toolkit-for-customizing-zebrafish-genomes-5_2265995685620875315
<http://flair.wittysparks.com/article/099p3Sd3mD1fp/team-develops-editing-toolkit-for-customizing-zebrafish-genomes>

http://www.innovations-report.com/html/reports/life_sciences/mayo_researchers_develop_editing_toolkit_customizing_202770.html

http://www.ansa.it/scienza/notizie/rubriche/biotech/2012/09/24/Dopo-topo-arriva-pesce-laboratorio_7525377.html

http://www.labspace.net/123753/Mayo_researchers_develop_editing_toolkit_for_customizing_zebrafish_genomes

http://www.kurzweilai.net/custom-gene-editing-rewrites-zebrafish-dna?utm_source=KurzweilAI+Daily+Newsletter&utm_campaign=675263cbea-UA-946742-1&utm_medium=email

<http://www.geekosystem.com/zebrafish-genome-editing/>

<http://idlnmclean.tumblr.com/post/32214996575/joshbyard-researchers-gain-ability-to-re-write>

<http://www.scoop.it/t/tal-effector-science/p/2785569130/heritable-gene-targeting-in-zebrafish-using-customized-talens-nature-biotech>

http://www.hematologytimes.com/p_article.do?id=2662&utm_source=twitterfeed&utm_medium=twitter

<http://frenchtribune.com/teneur/1213605-genomes-zebrafish-unlocked>

<http://www.news.iastate.edu/news/2012/09/28/zebrafishnature>

Total e-Clips Research Breakthroughs, No. 2647, Sept 24, 2012

Faculty of 1000 recommendation: <http://f1000.com/717959396>

76. Sohni A, Mulas F, Ferrazzi F, Luttun A, Bellazzi R, Huylebroeck D, **Ekker SC**, and Verfaillie CM. (2012) TGF β 1-induced Baf60c Regulates Both Smooth Muscle Cell Commitment and Quiescence, *PLoS One*, 2012;7(10):e47629. Epub 2012 Oct 26. doi: 10.1371/journal.pone.0047629. PMID: PMC3482188.
 77. Pierret C, Sonju JD, Leicester JE, Hoody M, LaBounty TJ, Frimansdottir KR, **Ekker SC**. (2012) Improvement in Student Science Proficiency Through InSciEd Out. *Zebrafish*, 2012 Dec;9(4):155-168. doi: 10.1089/zeb.2012.0818. PMID: PMC3529492.
 78. Khurana S, Buckley S, Schouteden S, **Ekker SC**, Petryk A, Delforge M, Zwijsen A, Verfaillie CM. (2013) A Novel Role of BMP4 in Adult Hematopoietic Stem and Progenitor Cell Homing via Smad Independent Regulation of Integrin- α 4 Expression. *Blood*. 2013 Jan 31;121(5):781-790. doi: 10.1182/blood-2012-07-446443. Epub 2012 Dec 13.
 79. Neff KL, Argue DP, Ma AC, Lee HB, Clark KJ, and **Ekker SC**. (2013) Mojo Hand, a TALEN Design Tool for Genome Editing Applications. *BMC Bioinformatics*, 2013 Jan 16;14:1, doi: 10.1186/1471-2105-14-1. Epub 2013 Jan 16. PMID: PMC3575288. <http://www.biomedcentral.com/1471-2105/14/1>
- Highly accessed*
80. Ding Y, Liu W, Deng Y, Jomok B, Yang J, Huang W, Clark KJ, Zhong TP, Lin X, **Ekker SC**, and Xu X. (2013) Trapping Cardiac Recessive Mutants via Expression-Based Insertional Mutagenesis Screening. *Circ Res*, 2013 Feb 15;112(4):606-617. doi: 10.1161/CIRCRESAHA.112.300603. Epub 2013 Jan 2. PMID: PMC3603352.
 81. Chen Z, Lee H, Henle SJ, Cheever TR, **Ekker SC**, Henley JR. (2013) Primary Neuron Culture for Nerve Growth and Axon Guidance Studies in Zebrafish (*Danio rerio*). *PLoS One*, 2013;8(3): e57539. doi:10.1371/journal.pone.0057539. Epub 2013 Mar 4. PMID: PMC3587632. <http://connexoncreative.com/publications/archives/NCN709.aspx>
 82. Koep TH, Ender FT, Pierret C, **Ekker SC**, Krageschmidt D, Neff KL, Lipsitch M, Shaman J, and Huskins WC. (2013) Predictors of Indoor Absolute Humidity and Estimated Effects on Influenza Virus Survival in Grade Schools. *BMC Infect Dis*, 2013 Feb 5;13:71. doi: 10.1186/1471-2334-13-71. PMID: PMC3568414. *Highly accessed*
 83. Patowary A, Purkanti R, Singh M, Chauhan R, Singh AR, Swarnkar M, Singh N, Pandey V, Torroja C, Clark MD, Kocher J-P, Clark KJ, Stemple DL, Klee EW, **Ekker SC**, Scaria V, and Sivasubbu S. (2013) A Sequence-Based Variation Map of Zebrafish. *Zebrafish*, 2013

- Mar;10(1):15-20. doi: 10.1089/zeb.2012.0848. PMID: PMC3629779.
84. Tietz Bogert PS, Huang BQ, Gradilone SA, Masyuk TV, Moulder GL, **Ekker SC**, and LaRusso NF. (2013) The Zebrafish as a Model to Study Polycystic Liver Disease. *Zebrafish*, 2013 Jun;10(2):211-217. doi: 10.1089/zeb.2012.0825. Epub 2013 May 13. PMID: PMC3673589.
 85. Ma AC, Lee HB, Clark KJ, and **Ekker SC**. (2013) High Efficiency *In Vivo* Genome Engineering with a Simplified 15-RVD GoldyTALEN Design. *PLoS One*, 2013 May 29;8(5):e65259. doi: 10.1371/journal.pone.0065259. Print 2013. PMID: PMC3667041. <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0065259>
 86. Cousin MA, Ebbert JO, Wiinamaki AR, Urban MD, Argue DP, **Ekker SC**, and Klee EW. (2014) Larval Zebrafish Model for FDA-Approved Drug Repositioning for Tobacco Dependence Treatment. *PLoS One*, 2014 Mar 21;9(3):e90467. eCollection 2014. doi: 10.1371/journal.pone.0090467. PMID: PMC3962344.
 87. Craig TA, Zhang Y, Magis AT, Funk CC, Price ND, **Ekker SC**, and Kumar R. (2014) Detection of 1,25-Dihydroxyvitamin D-Regulated miRNAs in Zebrafish by Whole Transcriptome Sequencing. *Zebrafish*, 2014 Jun;11(3):207-18. Epub 2014 Mar 20. doi: 10.1089/zeb.2013.0899. PMID: PMC4050706.
 88. He B-L, Shi Z, Man CH, Ma ACH, **Ekker SC**, Chow HCH, So CWE, Choi WWL, Zhang W, Zhang Y, and Leung AYH. (2014) Functions of *flt3* in Zebrafish Hematopoiesis and its Relevance to Human Acute Myeloid Leukemia. *Blood*, 2014 Apr 17;123(16):2518-2529. doi: 10.1182/blood-2013-02-486688. Epub 2014 Mar 3. PMID: PMC4017313.
 89. Singh M, Bhartiya D, Maini J, Sharma M, Singh AR, Kadarkaraisamy S, Rana R, Sabharwal A, Nanda S, Ramachandran A, Mittal A, Kapoor S, Sehgal P, Asad Z, Kaushik K, Vellarikkal SK, Jagga D, Muthuswami M, Chauhan RK, Leonard E, Priyadarshini R, Halimani M, Malhotra S, Patowary A, Vishwakarma H, Joshi P, Bhardwaj V, Bhaumik A, Bhatt B, Jha A, Kumar A, Budakoti P, Lalwani MK, Meli R, Jalali S, Joshi K, Pal K, Dhiman H, Laddha SV, Jadhav V, Singh N, Pandey V, Sachidanandan C, **Ekker SC**, Klee EW, Scaria V, Sivasubbu S. (2014) The Zebrafish GenomeWiki: a Crowdsourcing Approach to Connect the Long Tail for Zebrafish Gene Annotation. *Database (Oxford)*, 2014 Feb 26;2014:bau011. doi: 10.1093/database/bau011. Print 2014. PMID: PMC3936183.
 90. Wu X, Blackburn PR, Tschumper RC, **Ekker SC**, and Jelinek DF. (2014) TALEN-Mediated Genetic Tailoring as a Tool to Analyze the Function of Acquired Mutations in Multiple Myeloma Cells. *Blood Cancer J*, 2014 May 9;4(5):e210. doi: 10.1038/bcj.2014.32. PMID: PMC4042302.
 91. Koep TH, Huskins WC, Clemens C, Jenkins S, Pierret C, **Ekker SC**, Enders FT. (2014) Influenza Knowledge, Attitude, and Behavior Survey for Grade School Students: Design and Novel Assessment Methodology. *J Community Health*, 2014 Dec;39(6):1231-1240. doi: 10.1007/s10900-014-9884-0. Epub 2014 May 24. PMID: PMC4769434.
 92. Fadel HJ, Morrison JH, Saenz DT, Fuchs JR, Kvaratskhelia M, **Ekker SC**, and Poeschla EM. (2014) TALEN Knockout of the PSIP1 Gene in Human cells: Analyses of HIV-1 Replication and Allosteric Integrase Inhibitor Mechanism. 2014 Sep 1;88(17):9704-17. doi: 10.1128/JVI.01397-14. Epub 2014 Jun 18. PMID: PMC4136317.
 93. Sun X, **Ekker SC**, Shelden EA, Takubo N, Wang Y, and Burghardt TP. (2014) *In Vivo* Orientation of Single Myosins in a Zebrafish Embryo. *Biophys J*. 2014 Sep 16;107(6):1403-1414. PMID: PMC4167300.
 94. Craig MP, Grajevskaja V, Liao H-K, Balciuniene J, **Ekker SC**, Park J-S, Essner JJ, Balciunas D, and Sumanas S. (2015). *Etv2* and *Fli1b* Function Together as Key Regulators of Vasculogenesis and Angiogenesis. *Arterioscler Thromb Vas Biol*. 2015 Apr;35(4):865-876. doi: 10.1161/ATVBAHA.114.304768. [Epub 2015 Feb 26]. PMID: PMC4427907.
 95. Hoepfner LH, Sinha S, Wang Y, Bhattacharya R, Dutta S, Gong X, Bedell VM, Suresh S, Chun CZ, Ramchandran R, **Ekker SC**, and Mukhopadhyay D. (2015) RhoC Maintains Vascular Homeostasis by Regulating VEGF-Induced Signaling in Endothelial Cells. *J Cell*

- Sci*, 2015 Oct 1;**128**(19):3556-3568. doi: 10.1242/jcs.167601. Epub 2015 Jul 1. PMID: PMC4647168.
96. Westcot SE, Hatzold J, Urban MD, Richetti SK, Skuster KJ, Harm RM, Cervera RL, Umemoto N, McNulty MS, Clark KJ, Hammerschmidt M, and **Ekker SC**. (2015). Protein-Trap Insertional Mutagenesis Uncovers New Genes Involved in Zebrafish Skin Development, Including a Neuregulin 2a-Based Erbb Signaling Pathway Required During Median Fin Fold Morphogenesis. *PLoS One*, 2015 Jun 25;**10**(6):e0130688. doi: 10.1371/journal.pone.0130688. eCollection 2015. PMID: PMC4482254.
97. Yang J, LaBounty TJ, **Ekker SC**, and Pierret C. (2016) Students Being and Becoming Scientists: Measured Success in a Novel Science Education Partnership. *Palgrave Commun*. 2016;**2**:16005. doi:10.1057/palcomms.2016.5. Epub 2016 Mar1. PMCID: PMC6555486.
98. Ma AC, McNulty MS, Poshusta TL, Campbell JM, Martínez-Gálvez G, Argue DP, Lee HB, Urban MD, Bullard CE, Blackburn PR, Man TK, Clark KJ, and **Ekker SC**. (2016). FusX: A Rapid One-Step Transcription Activator-Like Effector Assembly System for Genome Science. *Human Gene Ther*. 2016 Jun;**27**(6):451-63. doi: 10.1089/hum.2015.172. Epub 2016 Mar 15. PMID: PMC4931509.

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Patent issued and licensed

99. Leveque RE, Clark KJ, and **Ekker SC**. Mayo Clinic Zebrafish Facility Overview (2016). *Zebrafish*, 2016 Jul;**13** Suppl 1(Suppl 1):S44-6. doi: 10.1089/zeb.2015.1227. Epub 2016 Mar 29. PMID: PMC4931757.
100. Zhao Y, Wang L, Ren S, Blackburn PR, McNulty MS, Gao X, Qiao M, Vessella RL, Kohli M, Zhang J, Karnes RJ, Tindall DJ, Kim Y, MacLeod R, **Ekker SC**, Kang T, Sun Y, and Huang H. (2016) Activation of P-TEFb by Androgen Receptor-Regulated Enhancer RNAs in Castration-Resistant Prostate Cancer. *Cell Rep*. 2016 Apr 19;**15**(3):599-610. doi: 10.1016/j.celrep.2016.03.038. Epub 2016 Apr 7. PMID: PMC5395199.
101. Ni J, Wangenstein KJ, Nelsen D, Balciunas D, Skuster KJ, Urban MD, and **Ekker SC**. (2016) Active Recombinant Tol2 Transposase for Gene Transfer and Gene Discovery Applications. *Mob DNA*. 2016 Mar 31;**7**:6. doi: 10.1186/s13100-016-0062-z. eCollection 2016. PMID: PMC4818426.
102. Welker JM, Wierson WA, Wang Y, Poshusta TL, McNulty MS, Tisdale EE, Solin SL, **Ekker SC**, Clark KJ, McGrail M, and Essner JJ. (2016) GoldyTALEN Vectors with Improved Efficiency for Golden Gate TALEN Assembly. *Hum Gene Ther*. 2016 Jun;**27**(6):423-4. doi: 10.1089/hum.2016.012. Epub 2016 May 6. PMID: PMC4931354.
103. Koep TH, Jenkins S, Hammerlund MEM, Clemens C, Fracica E, **Ekker SC**, Enders FT, Huskins WC, Pierret C. (2016) Promotion of Influenza Prevention Beliefs and Behaviors Through Primary School Science Education. *Community Med Health Educ*. 2016 Jun;**6**(3):444. doi: 10.4172/2161-0711.1000444. Epub 2016 Jun 27. PMID: PMC4982516.
104. Blackburn PR, Hickey RD, Nace RA, Giama NH, Kraft DL, Bordner AJ, Chaiteerakij R,

- McCormick JB, Radulovic M, Graham RP, Torbenson MS, Tortelli S, Scott CR, Lindor NM, Milliner DS, Oglesbee D, Al-Qabandi W, Grompe M, Gavrillov DK, El-Yousef M, Clark KJ, Atwal PS, Roberts LR, Klee EW, and **Ekker SC**. (2016) Silent Tyrosinemia Type I Without Elevated Tyrosine or Succinylacetone Associated with Liver Cirrhosis and Hepatocellular Carcinoma. *Hum Mutat*. 2016 Oct;37(10):1097-105. doi: 10.1002/humu.23047. Epub 2016 Aug 8. PMID: PMC5108417.
105. Ding Y, Long PA, Bos JM, Shih Y-H, Ma X, Sundsbak RS, Chen J, Jiang Y, Zhao L, Hu X, Wang J, Shi Y, Ackerman MJ, Lin X, **Ekker SC**, Redfield MM, Olson TM, and Xu X. (2016) A Modifier Screen Identifies DNAJB6 as a Cardiomyopathy Susceptibility Gene. *JCI Insight*. 2016 Sep 8;1(14):e88797. doi: 10.1172/jci.insight.88797. PMID: PMC5023154.
106. Lee SH, Turchiano G, Ata H, Nowsheen S, Romito M, Lou Z, Ryu S-M, **Ekker SC***, Cathomen T*, and Kim J-S*. (2016) Failure to Detect DNA-Guided Genome Editing Using *Natronobacterium gregoryi* Argonaute. *Nat Biotech*. 2016 Nov 28;35(1):17-18. doi: 10.1038/nbt.3753. PMID: PMC5662444. * Corresponding authors.
107. Ding Y, Long PA, Bos JM, Shih Y-H, Ma X, Sundsbak RS, Chen J, Jiang Y, Zhao L, Hu X, Wang J, Shi Y, Ackerman MJ, Lin X, **Ekker SC**, Redfield MM, Olson TM, and Xu X. (2017) A Modifier Screen Identifies DNAJB6 as a Cardiomyopathy Susceptibility Gene. *JCI Insight* (Published Erratum). 2017 Apr 20;2(8):e94086. doi: 10.1172/jci.insight.94086. PMID: PMC5396515.
108. El-Rass S, Eisa-Beygi S, Khong E, Brand-Arzamendi K, Mauro A, Zhang H, Clark KJ, **Ekker SC**, and Wen X-Y. (2017) Disruption of *pdgfra* Alters Endocardial And Myocardial Fusion During Zebrafish Cardiac Assembly. *Biol Open*. 2017 Mar 15;6(3):348-357. doi: 10.1242/bio.021212. PMID: PMC5374395.
109. Yang J, Lopez Cervera R, Tye SJ, **Ekker SC**, Pierret C. (2018) Adolescent Mental Health Education InSciEd Out: a Case Study of an Alternative Middle School Population. *J Transl Med*. 2018 Apr 3;16(1):84. doi: 10.1186/s12967-018-1459-x. PMID: PMC5883586.
110. Ata H, Ekstrom TL, Martinez-Galvez G, Mann CM, Dvornikov AV, Schaeffbauer KJ, Ma AC, Dobbs D, Clark KJ, and **Ekker SC**. (2018) Robust Activation of Microhomology-Mediated End Joining for Precision Gene Editing Applications. *PLoS Genet*. 2018 Sep 12;14(9):e1007652. doi: 10.1371/journal.pgen.1007652. eCollection 2018 Sep. PMID: PMC6152997.
111. Ignatius MS, Hayes MN, Moore FE, Tang Q, Garcia SP, Blackburn PR, Baxi K, Wang L, Jin A, Ramakrishnan A, Reeder S, Chen Y, Nielsen GP, Chen EY, Hasserjian RP, Tirode F, **Ekker SC**, and Langenau DM. (2018) *tp53* Deficiency Causes a Wide Tumor Spectrum and Increases Embryonal Rhabdomyosarcoma Metastasis in Zebrafish. *eLife*. 2018 Sep 7;7:e37202. doi: 10.7554/eLife.37202. PMID: PMC6128690.
112. Reiman JM, Das B, Sindberg GM, Urban MD, Hammerlund MEM, Lee HB, Spring KM, Lyman-Gingerich J, Generous AR, Koep TH, Ewing K, Liljia P, Enders FT, **Ekker SC**, Huskins WC, Fadel HJ, and Pierret C. (2018). Humidity as a Non-Pharmaceutical Intervention for Influenza A. *PLoS One*. 2018 Sep 25;13(9):e0204337. doi: 10.1371/journal.pone.0204337. eCollection 2018. PMID: PMC6155525.
113. Greenberg-Worisek AJ, Campbell KA, Klee EW, Staff NP, Schimmenti LA, Weavers KM, **Ekker SC**, Windebank AJ. (2019) Case-Based Learning in Translational Biomedical Research Education: Providing More Realistic and Adaptive Skills for Early-Career Scientists. *Acad Med*. 2019 Feb;94(2):213-216. doi: 10.1097/ACM.0000000000002470. PMID: PMC6351155.
114. Ichino N and **Ekker SC**. (2019) Taking a Closer Look at Whole Organisms. *Elife*. 2019 Jun 14;8:e48340. doi: 10.7554/eLife.48340. PMID: PMC6570477.
115. Thierer JH, **Ekker SC**, and Farber SA. (2019) The LipoGlo Reporter System for Sensitive and Specific Monitoring of Atherogenic Lipoproteins. *Nature Commun*. 2019 Jul 31;10(1):3426. doi: 10.1038/s41467-019-11259-w. PMID: PMC6668417.
116. Mann C[#], Martínez-Gálvez G[#], Welker J, Wierson W, Ata H, Almeida M, Clark K, Essner JJ*, McGrail M, **Ekker SC***, and Dobbs D. (2019) The Gene Sculpt Suite: A Set of Tools

- for Genome Editing. *Nucleic Acid Res.* 2019 Jul 2;**47**(W1):W175-W182. doi: 10.1093/nar/gkz405. PMCID: PMC6602503. #Co-first authors; *Co-corresponding authors.
117. Wierson WA[#], Simone BW[#], WareJoncas Z, Mann C, Welker JM, Kar B, Emch MJ, Friedberg I, Gendron WAC, Barry MA, Clark KJ, Dobbs DL, McGrail MA, Ekker SC*, Essner JJ* (2019) Expanding the CRISPR Toolbox with ErCas12a in Zebrafish and Human cells. *CRISPR J.* 2019 Dec;**2**(6):417-433. doi: 10.1089/crispr.2019.0026. Epub 2019 Nov 19. PMCID: PMC6919245. #Co-first authors; *Co-corresponding authors.
118. Wierson WA, Welker JM, Almeida MP, Mann CM, Webster DA, Torrie ME, Weiss TJ, Kambakam S, Vollbrecht MK, Lan M, McKeighan KC, Levey J, Ming Z, Wehmeier A, Mikelson CS, Haltom JA, Kwan KM, Chien C-B, Balciunas D, **Ekker SC**, Clark KJ, Webber BR, Moriarity BS, Solin SL, Carlson DF, Dobbs DL, McGrail M, Essner J. (2020) Efficient Targeted Integration Directed by Short Homology in Zebrafish And Mammalian Cells. *eLife.* 2020 May 15;9:e53968. doi: 10.7554/eLife.53968. PMCID: PMC7228771. Patent filed and licensed
119. Ma X, Zhu P, Ding Y, Zhang H, Qui Q, Dvornikov A, Wang Z, Kim M, Lowerison M, Yu Y, Norton N, Herrmann J, **Ekker SC**, Hsiai T, Lin X, Xu X. (2020) Retinoid X Receptor Alpha is a Spatiotemporally Predominant Therapeutic Target for Anthracycline-Induced Cardiotoxicity. *Sci Adv.* 2020 Jan 29;**6**(5):eaay2939. doi: 10.1126/sciadv.aay2939. eCollection 2020 Jan. PMCID: PMC6989136.
120. Thierer JH, **Ekker SC**, and Farber SA. (2020) Author Correction: The LipoGlo Reporter System for Sensitive and Specific Monitoring of Atherogenic Lipoproteins. *Nat Commun.* 2020 Jul 21;**11**(1):3707. doi: 10.1038/s41467-020-17532-7. PMCID: PMC7374156.
121. Ichino N, Serres MR, Urban RM, Urban MD, Treichel AJ, Schaefbauer KJ, Greif LE, Varshney GK, Skuster KJ, McNulty MS, Daby CL, Wang Y, Liao H-K, El-Rass S, Ding Y, Liu W, Anderson JL, Wishman MD, Sabharwal A, Schimmenti LA, Sivasubbu, S, Balciunas D, Hammerschmidt M, Farber SA, Wen X-Y, Xu X, McGrail M, Essner JJ, Burgess SM, Clark KJ, and **Ekker SC**. (2020) Building the Vertebrate Codex Using the Gene Breaking Protein Trap Library. *Elife.* 2020 Aug 11;9:e54572. doi: 10.7554/eLife.54572. PMCID: PMC7486118.
122. Koleilat A, Dugdale JA, Christenson TA, Bellah JL, Lambert AM, Masino MA, **Ekker SC**, and Schimmenti LA. (2020) L-type Voltage-Gated Calcium Channel Agonists Mitigate Hearing Loss and Modify Ribbon Synapse Morphology in the Zebrafish Model of Usher Syndrome Type 1. *Dis Model Mech.* 2020 Nov 27;**13**(11):dmm043885. doi: 10.1242/dmm.043885. PMCID: PMC7710014.
123. Koleilat A, Argue DP, Schimmenti LA, **Ekker SC**, and Poling GL. (2020) The GoAudio Quantitative Mobile Audiology Test Enhances Access to Clinical Hearing Assessments. *Am J Audiol.* 2020 Dec 9;**29**(4):887-897. doi: 10.1044/2020_AJA-20-00060. Epub 2020 Oct 20. PMCID: PMC8608194
https://journals.lww.com/thehearingjournal/Fulltext/2021/09000/Portable_Anti_noise_Tool_Reliably_Assesses_Hearing.14.aspx
Patent filed
124. Martínez-Gálvez G, Joshi P, Friedberg I, Manduca A, and **Ekker SC**. (2021) Deploying MMEJ Using MENdel in Precision Gene Editing Applications for Gene Therapy and Functional Genomics. *Nucleic Acids Res.* 2021 Jan 11;**49**(1):67-78. doi: 10.1093/nar/gkaa1156. PMCID: PMC7797032.
125. Almeida MP, Welker JM, Siddiqui S, Luiken J, **Ekker SC**, Clark KJ, Essner JJ, McGrail M. (2021) Endogenous Zebrafish Proneural Cre Drivers Generated by CRISPR/Cas9 Short Homology Directed Targeted Integration. *Sci Rep.* 2021 Jan 18;**11**(1):1732. doi: 10.1038/s41598-021-81239-y. PMCID: PMC7813866.
126. Saha K, Sontheimer EJ, Brooks PJ, Dwinell MR Gersbach CA, Liu DR, Murray SA, Tsai SQ, Wilson RC, Anderson DG, Asokan A, Banfield JF, Bankiewicz KS, Bao G, Bulte JWM, Bursac N, Campbell JM, Carlson DF, Chaikof EL, Chen Z-Y, Cheng RH, Clark KJ, Curiel DT, Dahlman JE, Deverman BE, Dickinson ME, Doudna JA, **Ekker SC**, Emborg ME, Feng

- G, Freedman BS, Gamm DM, Gao G, Ghiran IC, Glazer PM, Gong S, Heaney JD, Hennebold JD, Hinson JT, Khvorova A, Kiani S, Lagor WR, Lam KS, Leong KW, Levine JE, Lewis JA, Lutz CM, Ly DH, Maragh S, McCray, Jr PB, McDevitt TC, Mirochnitchenko O, Morizane R, Murthy N, Prather RS, Ronald JA, Roy S, Roy S, Sabbisetti V, Saltzman WM, Santangelo PJ, Segal DJ, Shimoyama M, Skala MC, Tarantal AF, Tilton JC, Truskey GA, Vandsburger M, Watts JK, Wells KD, Wolfe SA, Xu Q, Xue W, Yi G, Zhou J, and The SCGE Consortium* (2021) The NIH Somatic Cell Genome Editing Program. *Nature*. Epub April 7, 2021. <https://dx.doi.org/10.1038/s41586-021-03191-1>. PMID: PMC8026397.
*A full list of members and their affiliations appears in the Supplementary Information.
127. Yang Yowler J, Knier K, WareJoncas Z, Ehlers SL, **Ekker SC**, Guasp Reyes F, Horazdovsky BF, Mueller G, Morales Gomez A, Sood A, Sussman CR, Scholl LM, Weavers KM, Pierret C. (2021) Rapid adaptation and remote delivery of undergraduate research training during the COVID 19 pandemic. *Sustainability*, 2021 May 29, 13:6133. <https://doi.org/10.3390/su13116133>. bioRxiv 2021 Feb 24;2021.02.24.432694. doi: 10.1101/2021.02.24.432694. Preprint. PMID: PMC7924266
128. Gendron WAC, Rubin JD, Hansen MJ, Nace, RA, Simone BW, **Ekker SC**, Barry MA. (2021) Unlocking *loxP* to Track Genome Editing In Vivo. *Genes (Basel)*, 2021 Aug 3, doi: 10.3390/genes12081204. PMID: PMC8394901
129. Wilson MH, **Ekker SC** and Farber SA. (2021) Imaging cytoplasmic lipid droplets *in vivo* with fluorescent perilipin 2 and perilipin 3 knock-in zebrafish. *eLife* 2021 Aug 13; 10:e66393, doi: 10.7554/eLife.66393, PMID: PMC8460263
130. Sabharwal A, Kar B, Restrepo-Castillo S, Holmberg S, Neal M, Kendall B, Cotter R, WareJoncas Z, Seiler C, Nakamaru-Ogiso E, Clark K and **Ekker SC** (*in press*). The FusX TALE Base Editor (FusXTBE) for rapid mitochondrial DNA programming of human cells *in vitro* and zebrafish disease models *in vivo*. *CRISPR J* . 2021 Dec;4(6):799-821. doi: 10.1089/crispr.2021.0061. Epub 2021 Nov 30. PMID: PMC8742272.
131. Simone BW, Lee HB, Daby CL, Ata H, Restrepo-Castillo S, Matinez Galvez G, Kar B, Gendron WAC, Clark KJ, and **Ekker SC**. (2022) Chimeric RNA:DNA donorguide improves Homology Directed Repair *in vitro* and *in vivo*. *CRISPR J* 2022 Feb;5(1):40-52. doi: 10.1089/crispr.2021.0087. Epub 2021 Dec 17. PMID: PMC8892967.
132. Welker JM, Wierson WA, Almeida MP, Mann CM, Torrie ME, Ming Z, **Ekker SC**, Clark KL, Dobbs DL, Essner JJ and McGrail M (2021) GeneWeld: Efficient Targeted Integration Directed by Short Homology in Zebrafish. *Bio Protoc* 2021 Jul 20;11(14):e4100. doi: 10.21769/BioProtoc.4100. PMID: PMC8329467
133. Hartono SP, Bedell VM, Alam SK, O'Gorman M, Serres M, Hall SR, Pal K, Kudges RA, Mukherjee P, Seelig DM, Meves A, Mukhopadhyay D, **Ekker SC***, and Hoepfner LH* (2022) Vascular Endothelial Growth Factor as an Immediate-Early Activator of UV-induced Skin Injury, *Mayo Clinic Proceedings*, 2022 Jan;97(1):154-164. doi: 10.1016/j.mayocp.2021.08.018. Epub 2021 Nov 23. PMID: PMC8742788.*Co-corresponding authors
Patent filed.
134. Schultz-Rogers LE, Thayer ML, Kambakam S, Wierson WA, Helmer JA, Wishman MD, Wall KA, Greig JL, Forsman JL, Puchhalapalli K, Nair S, Weiss TJ, Luiken JM, Blackburn PR, **Ekker SC**, Kool M, McGrail M. (2022) Rbbp4 loss disrupts neural progenitor cell cycle regulation independent of Rb and leads to Tp53 acetylation and apoptosis. *Dev Dyn* 2022 Mar 9. doi: 10.1002/dvdy.467. Online ahead of print. NIHMS ID: NIHMS1787496
135. Kar B, Sabharwal A, Restrepo-Castillo S, Simone BW, Clark KJ, and **Ekker SC**. (2022) An optimized FusX assembly-based method to introduce mitochondrial TC-to-TT variations. *STAR Protocols*, online ahead of print. <https://doi.org/10.1016/j.xpro.2022.101288>

Preprints:

1. Campbell JM, Perales Clemente E, Ata H, Vidal Folch N, Lui W, Clark KJ, Xu X, Oglesbee D, Nelson TJ, and **Ekker SC**. (2018). Engineering Targeted Deletions in the Mitochondrial Genome. *bioRxiv* 287342; doi: <https://doi.org/10.1101/287342>
Patent filed, licensed, and Mayo-earned exit.
2. Carlstrom LP, Cheever TR, Schoenfuss HL, McGee MR, **Ekker SC**, Henley JR. (2018). Synergy and Convergence of Pathways Controlling Functional Regeneration in the Spinal Cord. *bioRxiv* 334029; doi: <https://doi.org/10.1101/334029>
3. Sabharwal A, Campbell JM, WareJoncas Z, Wishman M, Ata H, Liu W, Ichino N, Bergren JD, Urban MD, Urban R, Poshusta TL, Ding Y, Xu X, Clark KJ, and **Ekker SC**. (2019) A Primer Genetic Toolkit for Exploring Mitochondrial Biology and Disease Using Zebrafish. *bioRxiv* doi: <https://doi.org/10.1101/542084>
4. Sabharwal A, Wishman MD, Lopez Cervera R, Serres MR, Anderson JL, Treichel AJ, Ichino N, Liu W, Yang J, Ding Y, Deng Y, Farber SA, Clark KJ, and **Ekker SC**. (2020) A Genetic Model Therapy Proposes a Critical Role for Liver Dysfunction in Mitochondrial Biology and Disease. *bioRxiv*. 2020.05.08.084681; doi: <https://doi.org/10.1101/2020.05.08.084681>
5. Wierson WA, Abel AM, Siegler EL, **Ekker SC**, Johannes CM, Kenderian SS, and Mochel JP. (2021) Gene Editing and Gene Therapy: Entering Uncharted Territory in Veterinary Oncology. Preprints.org, 17 Mayo 2021. doi:10.20944/preprints202105.0376.v1 (Review Article).

Preprints (now published):

1. Ma X, Ding Y, Zhang H, Qui Q, Dvornikov A, Kim M, Wang Y, Lowerison M, Yu Y, Herrmann J, **Ekker SC**, Hsiai T, Lin X, Xu X. (2018) Retinoid X Receptor Alpha is a Spatiotemporally Predominant Therapeutic Target for Doxorubicin-Induced Cardiotoxicity in Adult Zebrafish. *bioRxiv*. 490706; doi: <https://doi.org/10.1101/490706>
2. Ata H, Ekstrom TL, Martinez-Galvez G, Mann CM, Dvornikov AV, Schaeffbauer KJ, Ma AC, Dobbs D, Clark KJ, and **Ekker SC**. (2018) Toward Precision Molecular Surgery: Robust Selective Induction of Microhomology-Mediated End Joining in vivo. *bioRxiv* 291187; doi: <https://doi.org/10.1101/291187>
3. Reiman JM, Das B, Sindberg GM, Urban MD, Hammerlund MEM, Lee HB, Spring KM, Lyman-Gingerich J, Generous AR, Koep TH, Ewing K, Lilja P, Enders FT, **Ekker SC**, Huskins WC, Fadel HJ, and Pierret C. (2018). Humidity as a Non-Pharmaceutical Intervention for Influenza A. *bioRxiv* 273870; doi: <https://doi.org/10.1101/273870>.
4. Wierson WA, Welker JM, Almeida MP, Mann CM, Webster DA, Torrie ME, Weiss TJ, Kambakam S, Vollbrecht MK, Lan M, McKeighan KC, Levey J, Ming Z, Wehmeier A, Mikelson CS, Haltom JA, Kwan KM, Chien C-B, Balciunas D, **Ekker SC**, Clark KJ, Webber BR, Moriarity BS, Solin SL, Carlson DF, Dobbs DL, McGrail M, Essner J. (2019) GeneWeld: a Method for Efficient Targeted Integration Directed by Short Homology. *bioRxiv* 431627; doi: <https://doi.org/10.1101/431627>
5. Ichino N, Serres M, Urban RM, Urban MD, Schaeffbauer KJ, Greif LE, Varshney GK, Skuster KJ, McNulty MS, Daby CL, Wang Y, Liao H-K, El-Rass S, Ding Y, Liu W, Schimmenti LA, Sivasubbu, S, Balciunas D, Hammerschmidt M, Farber SA, Wen X-Y, Xu X, McGrail M, Essner JJ, Burgess SM, Clark KJ, **Ekker SC**. (2019) The Vertebrate Codex Gene Breaking Protein Trap Library for Genomic Discovery and Disease Modeling Applications. preprint *bioRxiv* 630236; doi: <https://doi.org/10.1101/630236>
6. Thierer JH, Ekker SC, and Farber SA. (2019) LipoGlo: A Sensitive and Specific Reporter of Atherogenic Lipoproteins. *bioRxiv*. 522615; doi: <https://doi.org/10.1101/522615>.
7. Koleilat A, Dugdale JA, Christenson TA, Bellah JL, Lambert AM, Masino MA, **Ekker SC**, and Schimmenti LA. (2019) L-type Voltage-Gated Calcium Channel Agonists Improve Hearing Loss and Modify Ribbon Synapse Morphology in the Zebrafish Model of Usher

- Syndrome Type 1. *bioRxiv*. 2019.12.16.878231; doi: <https://doi.org/10.1101/2019.12.16.878231>
8. Wierson WA[#], Simone BW[#], WareJoncas Z, Mann C, Welker JM, Kar B, Gendron WAC, Barry MA, Clark KJ, Dobbs DL, McGrail MA, Ekker SC*, Essner JJ* (2019) Expanding the CRISPR Toolbox with ErCas12a in Zebrafish and Human cells. *bioRxiv* 650515; doi: <https://doi.org/10.1101/650515>
 9. Martínez Gálvez G, Manduca A, Ekker SC. (2020) MMEJ-Based Precision Gene Editing for Applications in Gene Therapy and Functional Genomics. *bioRxiv* 2020.04.25.060541; doi: <https://doi.org/10.1101/2020.04.25.060541>.
 10. Gendron W, Rubin J, Simone B, **Ekker S**, Barry M, Nace R, and Hansen M. (2021) Unlocking LoxP to Track Genome Editing In Vivo. *Preprints.org* **2021**, 2021050422 (doi: 10.20944/preprints202105.0422.v1). Version 1 : Received: 15 May 2021 / Approved: 18 May 2021 / Online: 18 May 2021
 11. Almeida P, Welker JM, **Ekker SC**, Clark KJ, Essner JJ, McGrail M. (2021) Endogenous zebrafish neural Cre drivers generated by CRISPR/Cas9 short homology directed targeted integration. *bioRxiv* July 22, 2020
doi: <https://doi.org/10.1101/2020.07.21.214452>
 12. Hartono SP, Bedell VM, Alam SK, O’Gorman M, Serres M, Hall SR, Pal K, Kudgus RA, Mukherjee P, Seelig DM, Meves A, Mukhopadhyay D, **Ekker SC**, Hoepfner LH. (2020) Vascular Endothelial Growth Factor as an Immediate-Early Activator of UV-Induced Skin Injury. *bioRxiv*. 2020.07.13.198549; doi: <https://doi.org/10.1101/2020.07.13.198549>
 13. Wilson MH, **Ekker SC**, and Farber SA. (2021) Imaging Cytoplasmic Lipid Droplets *in vivo* with Fluorescent Perilipin 2 and Perilipin 3 Knockin Zebrafish. *bioRxiv* 2021.01.10.426109; doi: <https://doi.org/10.1101/2021.01.10.426109>
 14. Yang Yowler J, Knier K, WareJoncas Z, Ehlers SL, **Ekker SC**, Guasp Reyes F, Horazdovsky BF, Mueller G, Morales Gomez A, Sood A, Sussman CR, Scholl LM, Weavers KM, and Pierret C. (2021) Rapid Adaptation and Remote Delivery of Undergraduate Research Training During the COVID 19 Pandemic. *bioRxiv*. 2021 Feb 24;2021.02.24.432694. doi: 10.1101/2021.02.24.432694. PMID: PMC7924266. Preprint
 15. Sabharwal A, Kar B, Restrepo-Castillo S, Holmberg SR, Kendall BL, Cotter RP, WareJoncas Z, Clark KJ, and **Ekker SC**. (2021) The FuxX TALE Base Editor (FusXTBE) for rapid mitochondrial DNA programming of human cells *in vitro* and zebrafish disease models *in vivo*. *BioRxiv*, doi: <https://doi.org/10.1101/2021.05.18.444740>. Posted May 20, 2021.
 16. Simone BW, Lee HB, Daby CL, Restrepo-Castillo S, Matinez Galvez G, Ata H, Gendron WAC, Clark KJ, and Ekker SC. (2021) Chimeric RNA:DNA donorguide improves HDR in vitro and in vivo. *BioRxiv*, doi: <https://doi.org/10.1101/2021.05.28.446234> Posted May 28, 2021.

Reviews

1. **Ekker SC**. (2000) Morphants: A New Systematic Vertebrate Functional Genomics Approach. *Yeast / Comparative and Functional Genomics*, 2000 Dec;**17**(4):302-306. doi: 10.1002/1097-0061(200012)17:4<302::AID-YEA53>3.0.CO;2-#. PMID: PMC2448384.
2. Nasevicius A and **Ekker SC**. (2001) The Zebrafish as a Novel System for Functional Genomics and Therapeutic Development Applications. *Curr Opin Mol Ther*, 2001 Jun;**3**(3):224-228.
3. **Ekker SC** and Larson JD. (2001) Morphant Technology in Model Developmental Systems. *Genesis*, 2001 Jul;**30**(3):89-93. doi: 10.1002/gene.1038. [from special morpholino knockdown issue of genesis – see above]
4. Chen E and **Ekker SC**. (2004) Zebrafish as a Genomics Research Model. *Curr Pharm*

- Biotechnol.* 2004 Oct;**5**(5):409-413. doi: 10.2174/1389201043376652.
5. **Ekker SC.** (2005) VEGF, Sunburn, and Wrinkles. *Blood*, 2005 Mar;**105**(6), 2246. doi.org/10.1182/blood-2004-12-4956
 6. Balciunas D and **Ekker SC.** (2005) Trapping Fish Genes with Transposons. *Zebrafish*, 2005;**1**(4): doi: 10.1089/zeb.2005.1.335.335-341.
 7. Essner JJ, Chen E, and **Ekker SC.** (2006) Syndecan-2. *Int J Biochem Cell Biol.* 2006 Feb;**38**(2):152-156. doi: 10.1016/j.biocel.2005.08.012.
 8. Sivasubbu S, Balciunas D, Amsterdam A, and **Ekker SC.** (2007) Insertional Mutagenesis Strategies in Zebrafish, *Genome Biol.* 2007;**8** (Suppl 1):S9 (doi:10.1186/gb-2007-8-S1-S9).
Review article for *Genome Biology* special transposon issue. Ekker SC and Ivics Z, editors. <http://www.genomebiology.com/supplements/8/S1>
 9. **Ekker SC.** (2008) Zinc finger-based knockout punches for zebrafish genes. *Zebrafish*, 2008;**5**(2):121-123. doi: 10.1089/zeb.2008.9988. PMID: PMC2849655.
 10. Ni J, Clark KJ, Fahrenkrug SC, and **Ekker SC.** (2008) Transposon Tools Hopping in Vertebrates. *Brief Funct Genomic Proteomic.* 2008 Nov;**7**(6):444-453. doi: 10.1093/bfpg/eln049. PMID: PMC2722259.
<http://bfpg.oxfordjournals.org/cgi/content/full/eln049?ijkey=9SHxIsrVT8Cl1on&keytype=ref>
 11. Bill BR, Petzold AM, Clark KJ, Schimmenti LA, and **Ekker SC.** (2009) A Primer for Morpholino Use in Zebrafish. *Zebrafish*, 2009 Mar;**6**(1):69-77. PMID: PMC2776066. doi: 10.1089/zeb.2008.0555.
 12. Clark KJ, Boczek NJ, and **Ekker SC.** (2011) Stressing Zebrafish for Behavioral Genetics, *Rev Neurosci.* 2011;**22**(1):49-62. doi: 10.1515/RNS.2011.007. PMID: PMC3470424.
 13. Klee EW, Ebbert JO, Schneider H, Hurt RD, and **Ekker SC.** (2011) Zebrafish for the Study of the Biological Effects of Nicotine. *Nicotine Tob Res.* 2011 May;**13**(5):301-312. doi: 10.1093/ntr/ntr010. Epub 2011 Mar 8. PMID: PMC3145391.
 14. Bedell VM, Westcot SE, and **Ekker SC.** (2011) Lessons from Morpholino-Based Screening in Zebrafish. *Brief Funct Genomics.* 2011 Jul;**10**(4):181-188. doi: 10.1093/bfpg/eln021. Epub 2011 Jul 10. PMID: PMC3144740.
 15. Clark KJ, Voytas DF, and **Ekker SC.** (2011) A TALE of Two Nucleases: Gene Targeting for the Masses? *Zebrafish.* 2011 Sep;**8**(3):147-149. doi: 10.1089/zeb.2011.9993. PMID: PMC3174730.
 16. Klee EW, Schneider H, Clark KJ, Cousin MA, Ebbert JO, Hooten WM, Karpayak VM, Warner DO, and **Ekker SC.** (2012) Zebrafish: A Model for the Study of Addiction Genetics. *Hum Genet.* 2012 Jun;**131**(6):977-1008. doi: 10.1007/s00439-011-1128-0. Epub 2011 Dec 30. PMID: PMC3860818.
 17. Blackburn PR, Campbell JM, Clark KJ, and **Ekker SC.** (2013) The CRISPR System-- Keeping Zebrafish Gene Targeting Fresh. *Zebrafish.* 2013 Mar;**10**(1):116-118. doi: 10.1089/zeb.2013.9999. Epub 2013 Mar 28. PMID: PMC3629780.
Mary Ann Liebert Open Paper of the Day, Mar 16 2014
 18. Campbell JM, Hartjes KA, Nelson TJ, Xu X, and **Ekker SC.** (2013) The New and TALEnted Genome Engineering Toolbox. *Circ Res.* 2013 Aug 16;**113**(5):571-587. doi: 10.1161/CIRCRESAHA.113.301765. PMID: PMC3965580.
 19. Liu WB, Ding YH, Gore B, **Ekker SC,** and Xu X. (2013) Zebrafish insertional Cardiac (ZIC) Mutants: a Living Genomic Resource for Cardiac Biology. *Circ Res.* 2013 Aug;**113**:A347.
 20. Peng Y, Clark KJ, Campbell JM, Panetta MR, Guo Y, and **Ekker SC.** (2014) Making Designer Mutants in Model Organisms. *Development,* 2014 Nov;**141**(21):4042-4054. doi: 10.1242/dev.102186. PMID: PMC4302887.
 21. Martínez-Gálvez G, Ata H, Campbell J and **Ekker SC,** ssDNA and the Argonauts: the Quest for the Next Golden Editor. *Hum Gene Ther.* 2016 Jun;**27**(6):419-422. doi: 10.1089/hum.2016.071. PMID: PMC4931338.
 22. Stainier DYR, Raz E, Lawson ND, **Ekker SC,** Burdine RD, Eisen JS, Ingham PW, Schulte-Merker S, Yelon D, Weinstein BM, Mullins MC, Wilson SW, Ramakrishnan L, Amacher SL,

- Neuhauss SCF, Meng A, Mochizuki N, Panula P, Moens CB. Guidelines for Morpholino Use in Zebrafish. *PLoS Genet.* 2017 Oct;13(10):e1007000, eCollection 2017 Oct. doi: 10.1371/journal.pgen.1007000. PMID: PMC5648102.
23. Hoepfner LH, Sinha S, Wang Y, Bhattacharya R, Dutta S, Gong X, Bedell VM, Suresh S, Chun C, Ramchandrian R, **Ekker SC**, Mukhopadhyay D. (2018) Correction: RhoC maintains vascular homeostasis by regulating VEGF-induced signaling in endothelial cells. *J Cell Sci.* 2018 Mar 16;131(6):217604. doi: 10.1242/jcs.217604. PMID: PMC6295134.
 24. WareJoncas Z, Campbell JM, Martinez Galvez G, Gendron WAC, Barry MA, Harris PC, Sussman CR, and **Ekker SC**. (2018). Precision Gene Editing and Applications in Nephrology. *Nat Rev Nephrol.* 2018 Nov;14(11):663-677. doi: 10.1038/s41581-018-0047-x. [Epub ahead of print] PMID: PMC6591726.
 25. Simone BW, Martinez-Galvez G, WareJoncas Z, **Ekker SC**. (2018) Fishing for Understanding: Unlocking the Zebrafish Gene Editor's Toolbox. *Methods.* 2018 Nov 1;150:3-10. doi: 10.1016/j.ymeth.2018.07.012. Epub 2018 Aug 2. PMID: PMC6590056.
 26. WareJoncas Z, Campbell JM, Martinez-Galvez M, Gendron WA, Barry MA, Harris PC, Sussman CR, and **Ekker SC**. (2018) Precision gene editing technology and applications in nephrology. Review *Nat Rev Nephrol* 2018 Nov;14(11):663-677. doi: 10.1038/s41581-018-0047-x. PMID: PMC6591726
 27. Mochel JP, **Ekker SC**, Johannes CM, Jergens AE, Allenspach K, Bourgois-Mochel A, Knouse M, Benzekry S, Wierson W, LeBlanc AK, Kenderian SS. (2019) CAR T Cell Immunotherapy in Human and Veterinary Oncology: Changing the Odds Against Hematological Malignancies. *AAPS J.* 2019 Apr 8;21(3):50. doi: 10.1208/s12248-019-0322-1. <https://www.preprints.org/manuscript/201811.0525/v1>
 28. Ichino N and **Ekker SC**. (2019) Taking a Closer Look at Whole Organisms. *Elife.* 2019 Jun 14;8:e48340. doi: 10.7554/eLife.48340. PMID: PMC6570477.
 29. Wierson W, Abel A, Siegler E, **Ekker SC**, Johannes C, Kenderian S, Mochel J. (2022), Gene Editing and Gene Therapy: Entering uncharted territory in veterinary oncology. *Preprints* 2021, 2021050376 (doi: 10.20944/preprints202105.0376.v1).

Book Chapters (all invited)

1. Hyatt TM and **Ekker SC**. (1999) Vectors and Techniques for Ectopic Gene Expression in Zebrafish. *Methods Cell Biol.* 1999;59:117-126. doi: 10.1016/s0091-679x(08)61823-3.
2. **Ekker SC**. (2004) Nonconventional Antisense in Zebrafish for Functional Genomics Applications. "The Zebrafish: Genetics, Genomics and Informatics," 2nd edition, edited by H. W. Detrich, M. Westerfield, and L.I. Zon. *Methods Cell Biol.* 2004;77:121-136. doi: 10.1016/s0091-679x(04)77007-7.
3. Hermanson S, Davidson AE, Sivasubbu S, Balciunas D, and **Ekker SC**. (2004) *Sleeping Beauty* Transposon for Efficient Gene Delivery. *Methods Cell Biol.* "The Zebrafish: Genetics, Genomics and Informatics," 2nd edition, edited by H. W. Detrich, M. Westerfield, and L.I. Zon. *Methods Cell Biol.* 2004;77, 351-364. doi: 10.1016/s0091-679x(04)77019-3.
4. Chen E, Hackett PB, and **Ekker SC**. (2004) Gene 'Knockdown' Approaches Using Unconventional Antisense Oligonucleotides. In: *Molecular Aspects of Fish and Marine Biology Vol. 2: Fish Development and Genetics: The Zebrafish and Medaka Models* (eds, Z. Gong and V. Korzh). World Scientific. 2004;2:454-475. https://doi.org/10.1142/9789812565761_0013.
5. Hackett PB, Clark KJ, **Ekker SC**, and Essner JJ. (2004) Applications of Transposable Elements in Fish for Transgenesis and Functional Genomics. In: *Molecular Aspects of Fish and Marine Biology Vol. 2: Fish Development and Genetics: The Zebrafish and Medaka* (eds, Z. Gong and V. Korzh). World Scientific. 2004;2:532-580. https://doi.org/10.1142/9789812565761_0016.
6. Hackett PB, **Ekker SC**, Largaespada DA, McIvor RS. (2005) *Sleeping Beauty*

- Transposon-Mediated Gene Therapy for Prolonged Expression. In: *Non-Viral Vectors for Gene Therapy, 2nd Edition* (eds. L. Huang, E. Wagner, and M.-C. Hung). *Adv Genet.* 2005;**54**:189-232. doi: 10.1016/S0065-2660(05)54009-4.
7. Clark KJ, Urban MD, Skuster KJ, and **Ekker SC**. (2011) Transgenic Zebrafish Using Transposable Elements. *Methods Cell Biol.* 2011;104:137-149. doi: 10.1016/B978-0-12-374814-0.00008-2. PMID: PMC3454445.
 8. Schneider H, Klee EW, Clark KJ, Petzold AM, Mock VL, Abarr JM, Behrens JL, Edelen RE, Edwards BA, Hobgood JS, Pogue ME, Singh NK, and **Ekker SC**. (2012) Zebrafish and Drug Development: A Behavioral Assay System for Probing Nicotine Function in Larval Zebrafish. *Zebrafish Neurobehavioral Protocols Vol. II* (ed. A. Kalueff) 2012;**66**:53-70. doi: 10.1007/978-1-61779-597-8_4.
 9. Clark KJ and **Ekker SC**. (2012) From GloFish to Human Disease Models: Forward and Reverse Genetics in Zebrafish. *Frontiers in Research Articles Series, Nature Education / Bedford Freeman Worth*. <https://www.researchgate.net/publication/341946220>.
 10. Bedell VM and **Ekker SC**. (2015) Using engineered endonucleases to create knockout and knockin zebrafish models. Shondra M. Pruetz-Miller (ed.), *Chromosomal Mutagenesis, Methods in Molecular Biology*, vol. 1239, doi 10.1007/978-1-4939-1862-1_17, © Springer Science+Business Media New York 2015
 11. Clark KJ and **Ekker SC**. (2015) How Zebrafish Genetics Informs Human Biology. *Nature Education* 8(4):3
<http://www.nature.com/wls/topicpage/how-zebrafish-genetics-informs-human-biology-132740496>
 12. Ma ACH, Chen Y, Blackburn PR, **Ekker SC**. (2016) TALEN-Mediated Mutagenesis and Genome Editing. *Methods Mol Biol.* 2016;**1451**:17-30. doi: 10.1007/978-1-4939-3771-4_2. PMID: PMC5777227.
 13. Ata H, Clark KJ, and **Ekker SC**. (2016) The Zebrafish Genome Editing Toolkit. *Methods Cell Biol.* 2016;**135**:149-170. Cover article. doi: 10.1016/bs.mcb.2016.04.023. Epub 2016 May 30.

Other Notable Scientific Publications

1. **Ekker SC**. (Moderator), Stemple DL, Clark M, Chien C-B, Rasooly RS, Javois LC. Roundtable Discussion (2007) Zebrafish Genome Project: Bringing New Biology to the Vertebrate Genome Field. *Zebrafish.* 2007;**4**(4):239-251. doi: 10.1089/zeb.2007.9979.
2. **Ekker SC**. (2008) Editorial: Looking to the Future. *Zebrafish.* 2008;**5**(1):1-2. doi: 10.1089/zeb.2008.9994.
3. Aleström P, Begemann G, Carvan MJ 3rd, Cheng KC, Crosier K, Crosier P, **Ekker S**, Huttenlocher A, Kawakami K, Kelly G, Korzh V, Lieschke G, Mione M, Neely MN, Neuhauss S, and Trede NS. (2008) Views on Four Key Questions about Zebrafish Research. *Zebrafish.* 2008;**5**(1):9-24. doi: 10.1089/zeb.2008.9996.
4. **Ekker SC**. (2008) Down on the (Fish) Farm. *Zebrafish.* 2008;**5**(2):139-40. doi: 10.1089/zeb.2008.9990.
5. **Ekker SC**. (2008) Comment: The Three Musketeers of HSC Development. *Blood.* 2008 May 15;**111**(10):4834-4835. doi.org/10.1182/blood-2008-02-138982.
6. **Ekker SC**, Parichy DM and Cheng KC. (2008) Research Implications of Pigment Biology in Zebrafish. *Zebrafish.* 2008 Dec;**5**(4):233-235. doi: 10.1089/zeb.2008.9981.
7. **Ekker SC**. (2008) Editorial: All Eyes on Zebrafish. *Zebrafish.* 2008 Sep;**5**(3):153. doi: 10.1089/zeb.2008.9984.
8. **Ekker SC**, Hutson LD, Fields M. (2009) The Art and Science of Zebrafish in the Classroom-an interview with Melanie Fields. *Zebrafish.* 2009 June 18;**6**(2):121-126. doi.org/10.1089/zeb.2009.9995.
9. **Ekker SC** and Bedell VM. (2009) Comment: The Ins and Outs of VEGF Signaling. *Blood.*

- 2009 Mar 5; **113**(10):2123-2124. doi: 10.1182/blood-2008-11-189746.
10. Petzold AM, Clark KJ, and **Ekker SC**. (2009) Spotlight on the Future of Scientific Publication. *Zebrafish*. 2009 Sep; **6**(3):215-217. doi: 10.1089/zeb.2009.9992.
 11. Clark KJ and **Ekker SC**. *Zebrafish*. Published In: Brenner's *Encyclopedia of Genetics*, 2nd Edition. S. Maloy and K. Hughes: Editors-in-Chief: (2013). Pages 396-398. <https://doi.org/10.1016/B978-0-12-374984-0.01668-5>
 12. Bedell VM and **Ekker SC**. (2012) Editorial: Nervy Vasculature. *Arterioscler Thromb Vasc Biol*. 2012 Jul; **32**(7):1546-1547. doi: 10.1161/ATVBAHA.112.251272.
 13. Varga ZM, Lawrence C, **Ekker SC**, and Eisen JS. Editorial: Universal Health Care for Zebrafish. *Zebrafish*. 2016 Jul; **13**; **Suppl 1**(Suppl1):S1-4. doi: 10.1089/zeb.2016.1311. PMID: PMC5335744.
 14. Geurts AM and **Ekker SC**. (2016) Editorial: Gene Editing: Practical Application in the Lab. *Hum Gene Ther*. 2016 Jun; **27**(6):417-418. doi: 10.1089/hum.2016.29029.amg. PMID: PMC5583549.
 15. Varga ZM, **Ekker SC***, and Lawrence C*. (2018) Workshop Report - Zebrafish and Other Fish Models: Description of Extrinsic Environmental Factors for Rigorous Experiments and Reproducible Results. *Zebrafish*. 2018 Dec; **15**(6):533-535. *Corresponding authors. doi: 10.1089/zeb.2018.29006.zol. PMID: PMC7645980.
 16. <https://ash.confex.com/ash/2020/webprogram/Paper141115.html>

Ongoing Research Support

- 5R01-GM63904-17 (Ekker) 09/01/2001–05/31/2026 1.44 calendar
 NIGMS \$584,135 annual
 "Systematic Vertebrate Functional Genomics"
 This funding is to explore novel gene functions with a focus during this funding period on understudied nuclear encoded mitochondrial proteins and to build a comprehensive knockout collection of the mtDNA-encoded proteome. This proposal includes work at three sites, including Mayo Clinic (primary), Carnegie Institute (Baltimore), University of Cologne (Germany) and Children's Hospital (Philadelphia).
 Role: Principal Investigator
- U01AI 142773-3** (Ekker/Clark Co-I) 08/21/2018-07/31/2023 1.2 calendar
 NIH \$250,000 Total Award Directs
 "Building the mitochondrial genome editing repertoire"
 Development of mitochondrial DNA and RNA editing tools for potential therapeutic treatment of mitochondrial disease.
- R24 OD020166-5** (Essner, McGrail, Clark; Ekker, Co-PIs) 03/15/2020-03/14/2024 1.2 calendar
 NIH \$249,900 Total award directs to Mayo
 "Development of tools for site-directed analysis of gene function"
 This grant is to develop targeted genome editing tools, with a focus on deploying alternative DNA repair mechanisms such as microhomology-mediated end-joining (MMEJ).
 Role: Co-PI
- 1R01 CA 211887-01** (Staff) 9/18/2017-8/31/2022 0.12 calendar
 NIH \$228,751 (total award direct). \$2198 to Ekker

“Assessment of Chemotherapy-Induced Peripheral Neuropathy (IPN) susceptibility using patient-derived iPSC technology”

Dr. Ekker is a collaborator on this project testing a novel neuropathy pathway identified first in zebrafish for potential application in a clinically relevant model of CIPN derived from human iPSCs.

Role: Co-Investigator.

Mayo Clinic Robert and Arlene Kogod Center on Aging Westendorf, PI; Ekker Co-I
6/1/2021-5/31/2023

“CRISPR-Cas9 screen to identify mediators of oxidative stress in bone and cartilage”

This project explores the cellular mechanisms of senescence in human osteoblasts and chondrocytes.

Benefactor-based support

Mayo Clinic Section of the Marriott Mitochondrial Disease Network (Therapeutic Discovery)

Funder: Development - Gifts from benefactors

1/1/14 -11/30/22

\$142,984 Direct; \$171,581 Total (Annual)

1.2 calendar

This project is to build the Marriott Mitochondrial Disease Network, with Mayo Clinic, Harvard and Columbia. The Ekker lab has a component that supports developing the zebrafish as a model system platform for mitochondrial disease modeling for therapeutic development.

Completed/Transferred

8R25 GM129201-03 (Pierret)

06/01/2016-05/31/2021

0.24 calendar

NIH

\$257,536 total award direct / \$4397 to Ekker

"Turning K-12 Environmental STEM Education InSciEd Out"

This project develops environmental science educational modules for student-led active learning in the InSciEd Out program. Dr. Ekker serves as collaborative investigator with a focus on zebrafish science proposed within this program. Only personnel effort for Dr. Ekker is provided by this grant.

Role: Co-Investigator

Rotated off when became Dean, MCGSBS

2UL1 TR002377-2- (Khosla)

7/1/2011-6/30/2022

1.2 calendar

NCATS

\$8,055,636 Total Award Direct / \$21,983/year

“Mayo Clinic Center for Translational Science Activities”

Dr. Ekker is Predoctoral Program Co-Director for Clinical and Translational Sciences and Program Director, InSciEd Out science education reform initiative in the Mayo Clinic CTSA healthy community program.

Role: Co-Investigator

P30 DK84567-09 (LaRusso) 08/01/2009 – 08/31/2019 1.2 calendar
NIH \$135,000/year

“Mayo Center for Cell Signaling in Gastroenterology”

The role of the Genetics and Model Systems Core is to provide support and access to cutting-edge genetics technologies through education, infrastructure, and consultation services.

Role: Co-Investigator, Director - Genetics and Model Systems Core

P30DK090728 (Torres) 09/30/10-06/30/20 1.2 calendar
NIH/NIDDK

“Mayo Translational PKD Center (MTPC)”

Dr. Ekker contributes 10% effort towards organizing the ‘Model Systems Core’ scientists that provide animal models for PKD research in rodents, zebrafish and the nematode.

Role: Co-I Director, Model Systems Core

5R01 HG 006431-06 (Ekker) 08/01/2011 – 04/30/2019 0.12 calendar
NIGRI

“International Zebrafish Mutagenic Protein Trap”

This non-renewable resource grant funds the generation of 1000 new gene-break transposon lines for the zebrafish community.

Role: Investigator

InSciEd Out benefactor gifts; \$2.25M June 1, 2014- May 30, 2017; +\$176250 (10/16)
C. Pierret, Co-I.

Year 1: \$1M total

This gift is to expand the InSciEd Out science education platform in three networks - Minnesota (with the University of Minnesota), national (through the CTSA network), and international (through partners such as the India CSIR / Mayo Clinic partnership).

MNP #13.11 (Ekker, Voytas Co-Is) 02/01/14-12/31/16

“TALEMS: Locus-specific Targeted Methylation Technology”

This grant funds the development of locus-specific methylation technologies based on the customizable TALE system.

Role: Co-I @ 10% effort

Ekker total costs: \$300,000; \$94,339 direct annual

5R01-DA14546-05 (Ekker, PI) 05/01/2001 – 06/30/2014

NIH “Intron-based Mutagenic Transposons for Zebrafish”

Development of the transposons for transgenesis and mutagenesis approaches in the zebrafish.

Role: PI @ 20% effort;
years 7-12; \$3,463,988 total

Total \$1,698,750

ARRA Science Education Supplement 2009 \$85,000

H001274506-3 "University of Minnesota/ Mayo Clinic Gene Targeting Partnership."
07/01/10-06/30/13

Role Ekker, PI @10% effort; Dr. D. Voytas (UM) Co-PI Total: \$1,000,000; SCE
\$500,000

Mayo Clinic Internal (PI: Ikeda, Y) 06/01/12-05/31/13 0.60 calendar months

Mayo Clinic Center for Regenerative Medicine

TAL Effector nuclease (TALEN)-mediated site-specific genome modification of induced pluripotent stem cells (iPSCs) for genetically guided β -cell differentiation. This grant provides 0.6 calendar months' effort only to cover Dr. Ekker's participation in this collaborative research grant.

1R21AR058003-01A1 (Kumar, PI)

08/18/2010 – 05/31/2012

"1,25-Dihydroxyvitamin D and vitamin D Receptor Function in the Zebrafish Skeleton"

National Institute of Arthritis and Musculoskeletal and Skin Diseases

Role: Co-investigator @ 0.60 calendar months

Total \$390308

R01 DA14577-1 (PI: Koenig, B) 09/01/2009 – 08/31/2011

0.24 calendar months

NIH/NIDA

\$258,771/year

"Translating Addiction Genomics Research into Practice: Examining Ethics & Policy"

This grant covers the ethics of current and developing addiction human genetics and genomics practices.

NSF NIRT: Evaluating Oversight Models for Active Nanostructures and Nanosystems:
Learning from Past Technologies in a Societal Context 09/01/2006 –
08/30/2011

Role: Working Group Member / Senior Personnel (2.1% effort)

Transferred to role as external consultant, effective July 1, 2007

PO1-CA65493; Phil McGlave, PI; SCE Project Co-PI with Catherine Verfaillie

NIH Program Project Grant

07/1/05-06/30/10

"Biology and Transplantation of the Human Stem Cell"

Role: Co-Investigator @ 5% effort (Year 1, 10% years 2-5) Direct Costs Total to SCE
\$340,000

Minnesota Partnership for Translational Nanotechnology in Cancer

PIs: Dev Mukhopadhyay (Mayo) and S.C. Ekker (Univ Minnesota and Mayo Clinic)

Transferred to Dr. Wang (UM)

\$1,000,000 total

Alpha-1 Foundation Clifford Steer, PI; SCE Co-PI

07/01/2005 – 06/30/2007

"*Sleeping Beauty* Mediated RNAi Silencing of α -1 Z Genes"

The major goal of this project is to develop transposons for the treatment of alpha 1 antitrypsin deficiency by gene therapy.

Role: Co-Investigator @ 5% effort;

Total \$199,989

"Zebrafish as a Model to Study the Genetic Basis of Nicotine Addiction"

Grant-in-Aid of Research, University of Minnesota

SCE PI; Mark Thomas, Co-PI
Funded 07/06; Total: \$25,000

"Pharmacogenetics and Molecular Adaptations in Nicotine Addiction"
TTURC Grant; Dr. Mark Thomas, PI; SCE Co-PI
Funded 07/06; Total \$25,000

"Gold Nanoparticles for Delivery of Transposons to the Liver." UM Academic Health
Center Seed Grant. Dr. Andrew Taton, Co-PI. Funded 07/06; \$25,000

"The University of Minnesota Nanobiotechnology Initiative." UM Office of the Vice
President of Research Interdisciplinary Support Grant. 07/01/06-12/31/07
Role: SCE, Executive Director. Year 1 support, \$577,116
Transferred to Dr. Taton, UM

5T32DE07288-06-11 (Herzberg, PI; SCE, Co-Director @ 5% effort)
NIH/NIDCR 08/05/2002-06/30/2012
Minnesota Craniofacial Research Training Program (MinnCReST)
To engage trainees in novel, mentored training that is fundamental to biology and
human health, and applied research that expands the frontiers and scope of dental,
craniofacial and oral health research.
SCE resigned position effective July 1, 2007

5R01-GM55877-05 (Ekker, PI) 09/01/1997 – 08/31/2003
NIH Total: \$864,464
"Role of Frizzled Receptors in Embryogenesis"
The main goal of this grant was to understand the biological role(s) of frizzled genes in
development and to place these genes in known developmental pathways.
Role: PI

3408-9227-04 (Ekker, PI) 03/01/2004 – 02/28/2005
Minnesota Medical Foundation Total \$20,000
"Time-lapse and Real-time Confocal Imaging Station"
Role: PI

19648 (Ekker, PI) 01/01/2004 – 06/30/2005
Grant-in-Aid of Research, University of Minnesota Total: \$30,000
"Time-lapse and Real-time Confocal Imaging Station"
Role: PI

Ekker, PI 06/01/2003 – 05/31/2005
UM Cancer Center Breast Cancer Pilot Grant Total: \$25,000
"Development of Syndecan-2 as a Therapeutic Target for the Treatment of Breast
Cancer"
Role: PI

Track#R044108 (Ekker, PI; DAL, PAB, RSM Co-investigators) 09/01/1999 –
08/31/2005
The Arnold and Mabel Beckman Foundation Total: \$2,500,000
"Development of a New Gene Delivery System for Vertebrates"

This one-time grant established the A&M Beckman Center for Transposon Research at the Univ. Minn and focused on the development of transposons as a novel gene delivery system for gene discover and gene therapy applications.

Role: PI

#0002793 (Lisa Schimmenti, PI; SCE Co-PI) 07/01/2004 – 06/30/2006

Minnesota Medical Foundation Total: \$14,325

"Comparative Genetics of the PAX2 Pathway"

The major goal of this project is to identify genes regulated by the pax-2 transcription factor during mouse eye development. This grant has a no-cost extension until 06/30/2006.

Role: Co-Investigator

National

March of Dimes Basic O'Connor Scholar

Local

MMF Research Grant: Development of Sleeping Beauty Transposon in Zebrafish

UM Grant-in-Aid Frizzled Receptors in Embryogenesis

OTHER PRODUCTS

Clinical

Helped develop a new mtDNA heteroplasmy diagnostic with Dr. Devin Oglesbee

Educational Philosophy

I am deeply committed to the broad vision that excellence in science education is imperative for generating qualified scientists, engineers, and health care workers to address major concerns in the world. I also believe that a science-literate citizenry will be essential for our future.

I also believe that **students are powerful catalysts**. Supporting their development can result in new interdisciplinary scientific innovation while also generating a researcher with a unique perspective.

Mentoring future scientists: To that end, I am committed to serving as a mentor for postdocs, graduate students, MD/PhD students, post-bacs, undergraduates, and related scientists within my laboratory. I have successfully trained 13 PhD and 5 MD/PhD students to degree completion. All of my mentees are still using their training in scientific professions, with the 4 more senior MD/PhD students as faculty at outstanding institutions (U Washington; Cincinnati Children's; U Penn; U Penn) and the latest matching at Duke.

Training grants: I have served as both full-time and as an *ad hoc* member on NIH study panels to review training grants. These training grant environments are an effective way to build cohorts and community, a valuable component of a contemporary graduate program.

I served as Associate Director of the MiNNCREST T32 while I was a full-time faculty member at the University of Minnesota.

Since 2013, I have been Associate Director of the Clinical and Translational Sciences PhD track. This national-leading program focuses on the science of translation, with full expectation of basic science training while providing enhanced education in statistics and epidemiology necessary for human clinical trials. Our CTS PhD students graduate about one year earlier than the average of their peers in Mayo Graduate School, and yet show enhanced metrics such as papers, citations and grant productivity.

The CTS PhD program is also the most diverse at the Mayo Clinic. About 1/3 are URM (as measured using NIH criteria), and others show other aspects such as first generation college students.

Didactic teaching: while at the University of Minnesota, I taught undergraduates, medical and graduate students using the traditional lecture format. In addition, I used the laboratory environment for active learning. At the Mayo Clinic, I teach some lectures where I am a content expert. However, most of my educational focus is on fostering new active learning environments, including Case Studies in Entrepreneurship and an active learning, student-led advanced topics class on Epigenetics of Cancer and Addiction.

Building a healthier community through Integrated Science Education Outreach (InSciEd Out): I have also had the privilege of working alongside some amazing, similar-minded individuals who helped launch the Integrated Science Education Outreach (InSciEd Out) program to achieve science excellence in K-16 schools. This program is all about student-led, active learning for science excellence. The focus is to have a solid

base for community-level health literacy initiatives including vaccination, obesity and mental health. This program is now on three continents and includes a series of US hubs in Rochester, Twin Cities, Chicago and Brevard County, Florida.

Entrepreneurship is an ideal context to teach using active, project-based principles. We are working to assemble a certificate in innovation and entrepreneurship for 2019, and plan to complete a combined Master's degree program in Clinical Innovation and Entrepreneurship (MD students and MDs) and Master's in Innovation and Entrepreneurship in Clinical and Translational Science (PhD students).

Teaching and mentorship**University of Minnesota****1995-96 (Start Date 11/1/95)**

Mentor, BMBB graduate student

Saulius Sumanas

Mentor, University of Minnesota Undergraduate Life Sciences Program

Erin Walsh

Julie Gutman

Paul Judd

Mentor, Summer Research Camp for Women

1996-1997

Biochemistry Student Seminar Series Coordinator, 1996-97 (35 students; 50 minute)

Lecture GCB 5024 ; Spring, 1997 (15 students, 65 minute lecture)

Lecture, Advanced Developmental Genetics, 1997 (15 students; 50 minute lecture)

Mentor, BMBB graduate students

Saulius Sumanas

Aidas Nasevicius

Mentor, BMBB graduate student rotation

Gabriel Cheung

Mentor, Undergraduate Research Opportunity Program (UROP)

Hyon Kim

Mentor, University of Minnesota Summer Undergraduate Life Sciences Program

Erin Walsh

Hyon Kim

Mentor, Summer Research Camp for Women

Nine Dodge

1997-1998

Itasca Molecular & Cellular Biology Laboratory Course: Lecture and 3 day laboratory section, Fall 1997 (17 students; 60 minute lecture; 2-4 hour and 1-6 hour lab sessions)

Lecture series (5) GCB 5024 ; Spring, 1998 (32 students, 65 minute lectures)

Mentor, BMBB graduate students

Saulius Sumanas

Aidas Nasevicius

Mentor, MCDB&G graduate students

Pete Strege

Ann Davidson

Mentor, Undergraduate Honors Research

Jennifer Shaffer

Hyon Kim

Mentor, University of Minnesota Summer Undergraduate Life Sciences Program

Yul Kim

Hyon Kim

Mentor, Minority Scholars Development Program

Yuhgo Maruta

1998-1999

Itasca Molecular & Cellular Biology Laboratory Course: Lecture and 3 day laboratory section, Fall 1998 (9 students; 60 minute lecture; 2-4 hour and 1-6 hour lab sessions)

Lecture series (5) - BioC 6001; (165 students, 60 minute lectures)

Lecture series (5): GCB 5024 ; Spring, 1999 (15 students; 65 minute lectures)

Mentor, BMBB graduate students

- Saulius Sumanas
- Aidas Nasevicius

Mentor, MCDB&G graduate students

- Pete Strege
- Ann Davidson

Mentor, MD/PhD Program student

- Eleanor Chen

Mentor, MCDB&G graduate student rotation

- Yuhgo Maruta

Mentor, BMBB graduate student rotation

- Bill Wang

Mentor, Undergraduate Research Opportunity Program (UROP)

- Jennifer Shaffer

Mentor, Undergraduate Honors Research

- Hyon Kim
- Jennifer Shaffer
- Kenneth Finley

Mentor, University of Minnesota Summer Undergraduate Life Sciences Program

- Spencer Hermanson

Mentor, MD/PhD Program rotation student (summer)

- Hyon Kim

1999-2000

Itasca Molecular & Cellular Biology Laboratory Course: Lecture and 2 day laboratory section, Fall 1999 (13 students; 60 minute lecture; 2-4 hour lab sessions)

Lecture series (5) - BioC 6001; (165 students, 60 minute lectures)

Lecture series (8) – GCB 8161; (9 students, 65 minute lectures)

Lecture series (4) – Literature analysis course (15 students, 90 minute lectures)

Mentor, BMBB graduate students

- Saulius Sumanas
- Aidas Nasevicius

Mentor, MCDB&G graduate students

- Pete Strege
- Ann Davidson

Mentor, University of Minnesota Summer Undergraduate Life Sciences Program

- Cheryl Saunders

2000-2001

Course Director for Fall, 2000 Itasca Lab Course
Lecture series (5) - BioC 6001; (165 students, 60 minute lectures)
Lecture series (5) – BioC/GCD 8213 (25 students; 75 min. lectures)
Lecture series (5) – GCD 8161; (15 students, 65 minute lectures)
Lecture series (8) – Literature analysis course (15 students, 90 minute lectures)
Mentor, BMBB graduate students
 Saulius Sumanas
 Aidas Nasevicius
Mentor, MCDB&G graduate student
 Ann Davidson
Mentor, MCDB&G graduate student rotation
 Ryan Scott
Mentor, MD/PhD Program student rotation
 Eleanor Chen
Mentor, University of Minnesota Summer Undergraduate Life Sciences Program
 Jens Paul
Mentor, Undergraduate Researcher
 Michael Wiiasenen
 Eric Beckman
 Aaron Anderson

2001-2002

Course Director for Fall, 2001 Itasca Lab Course (13 students)
Lecture Series (5) BioC 6001(165? students, 60 minute lectures)
Lecture Series (4) Literature analysis course (14? students; 100 min. lectures)
Lecture and Lab (2 weeks) Undergraduate Cell and Development (21 students)
Lecture series (5) – GCD 8161; (15 students, 65 minute lectures)
Mentor, MCDB&G graduate student
 Ann Davidson
Mentor, MD/PhD Program student s(MCDB&G grad program)
 Eleanor Chen
 Hyon Kim
Mentor, Post-doctoral fellow
 Darius Balciunas
 Sridhar Sivasubbu
 Michael Pickart
Co-Mentor, Bioinformatics PhD student
 Eric Klee
Co-Mentor, Bioinformatics Post-doctoral fellow
 Fei Xu
Mentor, MD/PhD Program student rotation
 Kirk Wangenstein
Mentor, Undergraduate Researcher
 Andrea Schweikert
 Bridget Johnson
 David Shiroma
 Nishta Rao
 Eric Beckman

Rotation Student, MD/PhD Program
Kirk Wangenstein
Biology Colloquium lab tour
Institute of Child Development lab tour
Capital Hill Embryology Unit
Macalester College Development Course
Hosting and Lab Tour, Governor Pawlenty (Medical School) 04/03
International Business Development Conference (AHC) 05/03

2002-2003

Course Director for Fall, 2002 MCB Itasca Lab Course (33 students)
Lecture and Lab (2 weeks) Undergraduate Cell and Development (21 students)
Lecture series (5) – GCD 8161; (15 students, 65 minute lectures)
Lecture Series (11)– GCD 4161 Undergraduate Development Course (40 students)
Mentor, MCDB&G graduate student
Ann Davidson
Mentor, MD/PhD Program student s
Eleanor Chen (MCDB&G)
Hyon Kim (MCDB&G)
Kirk Wangenstein (BMBB)
Mentor, Post-doctoral fellows
Darius Balciunas
Sridhar Sivasubbu
Michael Pickart
Co-Mentor with Dr. Lynda Ellis, Bioinformatics PhD student
Eric Klee
MCB student rotations
Lucas Chase
Brent Bill
MD/PhD student rotation
Nate Charles
Mentor, DDS Masters student
Julian Davila
Embryology Course Support / Outreach
Carleton College
Macalester College
Graduate Student Committees
Brigit Riley
Aron Guerts
John Ohlfest
Paula Bryan
Tania Schroeder
Undergraduate Students
Zachary Welle
Paul Phelps
Claire Mielke

2003-2004

Course Director for Fall, 2003 MCB Itasca Lab Course (35 students) : MCDG 8920

Mentor, MCDB&G graduate students

Brent Bill

Ann Davidson

Mentor, MD/PhD Program student s

Eleanor Chen (MCDB&G)

Hyon Kim (MCDB&G)

Kirk Wangenstein (BMBB)

Mentor, Post-doctoral fellows

Darius Balciunas

Sridhar Sivasubbu

Michael Pickart

Co-Mentor, with Dr. Soraya Beiraghi, Post-doctoral fellow

Mara Robu

Co-Mentor with Dr. Lynda Ellis, Bioinformatics PhD student

Eric Klee

Co-Mentor with Dr. Catherine Verfaillie, Post-doctoral Fellow

Anskar Leung

MCB rotation

Andrea Horntvedt

Mary Kvitrud

Graduate Student Committees

Craig Eckfeldt

John Ohlfest

Eric Mendenhall

Lucas Chase

Paul Grimsrud

Melissa Rusch

Embryology Course Support / Outreach

Carleton College

Macalester College

Capitol Hill Elementary (St. Paul)

Undergraduate Students

Claire Mielke

Emily Dingmann

Tessa Hodapp

Sandra Leo

Amanda Mahoney

Elsbeth Ronnander

Daniel Wolbrink

Jessica Dahl

2004-2005

Mentor, MCDB&G graduate students

Brent Bill

Ann Davidson

Mentor, MD/PhD Program students

Hyon Kim (MCDB&G)
Kirk Wangenstein (BMBB)
Mentor, Post-doctoral fellows
Darius Balciunas
Sridhar Sivasubbu
Michael Pickart
Michelle Knowlton
Anthony Person
Co-Mentor, with Dr. Soraya Beiraghi, Post-doctoral fellow
Mara Robu
Co-Mentor with Dr. Lynda Ellis
Eric Klee - Bioinformatics PhD student
Kyong Shim – Computer Science PhD student
Co-Mentor with Dr. Catherine Verfaillie, Post-doctoral Fellow
Anskar Leung
Co-Mentor with Catherine Verfaillie, PhD Student
Eric Mendenhall
MD/PhD rotation (summer)
Michelle Hamline
Mentor, Undergraduate Researcher
Griselda Zuccarino
Emily Olson
Tessa Hodapp
Amanda Mahoney
Elspeth Ronnander
Daniel Wolbrink
Jessica Dahl
Graduate Student Committees
Craig Eckfeldt
John Ohlfest
Eric Mendenhall
Lucas Chase
Paul Grimsrud
Melissa Rusch
New Graduate Student Committees
Mark Osborn
Paula Grimsrud
Shannon Buckley
Jeff Ross
Hyun-jin Yang
Sam Stevens
Neal Jahren
Julia Hatler
MCB rotation
Der-I Kao
Course Director for GCD 8171

2005-2006

Summer Life Science Undergraduate

Stas Spiridonov

Course Director (with Tim Griffin) for MCDG 8920 (Itasca) 39 students

Course Director (with Eric Hendrickson) for BIOC 8401; 60 students

Molecular Genetics of the Zebrafish lecture, AnSci3509 (Mar 2, 2006)

MCB rotation

Abhishek Sohni

Shelly Myers

Stephanie Westcot

CMB rotation

Andy Petzold

MacAlester Developmental Biology lab tour

Cancer Center Science Museum Day, Feb 2006

7-8th grade Lab tour

Undergraduate Research

Elsbeth Ronnander

Nils Wubbels

Medical School Med Ed 2010 retreat, Sept 30, 2005

MED Ed 2010 Jan 2006

2006-2007

Summer Life Science Undergraduate

Lei Ke

Course Director (with Tim Griffin) for MCDG 8920 (Itasca) 39 students

Includes 5 students from KUL, Belgium

Undergraduate Research

Eric Young

Anoka Ramsey IRSP Undergraduate Research

Cassandra Goede

Drexel Medical Student Summer Internship

Paul Phelps

2006-07 [University Minnesota]

Undergraduate Researchers

Lei Ke [Summer Life Science Undergraduate Researcher]

Cassandra Goede [Anoka Ramsey IRSP Undergraduate Research]

Eric Young (Directed Research)

Elsbeth Ronnander (Directed Research)

Joshua McCarra

Course Director (with Tim Griffin) for MCDG 8920 (Itasca) 39 students

Includes 5 graduate students from KUL, Belgium

Course Director (with Eric Hendrickson) for BIOC 8401; 60 students

Drexel Medical Student Summer Internship

Paul Phelps

Minnesota Science Museum Nanotechnology faculty advisory group

MacAlester Developmental Biology zebrafish lab support

Carleton College Developmental Biology zebrafish lab support

Cancer Center Science Museum Day

Co-Director, MinnCResT Program (NIH T32 Training Grant)
Preparing Future Faculty II Course Guest Lecturer 4/9/07

2007-present [Mayo Clinic]

Graduate student (MD/PhD), Victoria Bedell

2009-2010 [Mayo Clinic]

Graduate student (MS), Faye Harris

2009 rotation [Mayo Clinic]

Debra Evans
Vladimir Gainullin

2010 rotation [Mayo Clinic]

Margot Cousin
Bennett Childs
Terra L. Lasho
Tyler Koep

2011 rotation [Mayo Clinic]

Randy Krug
Jarryd Campbell
Amber Kirk
Hind Fadel

2012 rotation [Mayo Clinic]

Han Lee
Joanna Yang
Patrick Blackburn
John Smestad

2013 summer undergrads

Hanna Vollbrecht
Thuyvan Luu
Elizabeth van Tuinen
Christal Clemens
Courtnee R. Heyduke UM
Cynthia Wilson
Benjamin Kopecky DePauw

2014 summer undergrads (2)**2014 rotation**

HirotaKa Ata (summer 2014) MD/PhD student
Alexander Generous

2015 summer undergrads

Mary Vang
Yi Chen
Herbert Sizek

2015 rotation

Alaa Koleilat
Gabriel Martinez Galvez
Elizabeth Dillinger
William Gendron

2016 summer undergrads

Jeffrey Lawrence Bellah

Madelyn O'Gorman
Enoch Tan
Zachary Ware Joncas

2016 rotation

Dushyant Mehra

2017 rotation

Kendall Schick
Brandon Simone

Employee Masters

Nhien Vinh Chau - Fall 2014
Kristin McGill – Spring 2018

K99 faculty

Luke Hoepfner

K08 faculty

Hind Fadel

2018 summer undergraduates

Yun Zhang
Reid Loveless

2019 summer undergraduates

Yifan Chen (yifan.chen@berkeley.edu)
Montana Hunter (mhunter2@willamette.edu)

2020 summer undergraduates

Sooik Son (sons@dickinson.edu)
Paul Gomez

2021 summer undergraduates

Noa Odell (odellnoaj@gmail.com)
Hannah Yamagata (hannahyamagata@gmail.com)

2021 rotation

Jaida Lane

2022 Work Study Students:

Patricia Hernandez
Pal Koak

2022 Summer undergraduates

Shreya Rao (shreya2k01@gmail.com ; Mayo/UIUC SURF)
Isaiah Perez (iperez22@miners.utep.edu ; Mayo/UTEP BUILDing SCHOLARS SURF program)

EKKER, Stephen Current Trainees				
Current Graduate Students				
<i>Student Name Training level Training period</i>	<i>Prior Institution and Degree</i>	<i>Title of Research Project</i>	<i>Current Position OR Source of Support</i>	<i>Citizen US MN</i>
<u>Santiago Restrepo Castillo</u> PhD candidate 2019-present	BS, Escuela de Ingenieria de Antioquia, Colombia, 2018	Programmable mitochondrially-targeted nucleases for gene therapy applications		No No
<u>Adriana Morales Gomez</u> PhD candidate 2021-present	BS, Ithaca College, 2013-2017, Graduate level classes, Cornell University, 2017- 2020	Focusing on amyotropic lateral sclerosis and the application of gene editing as possible treatment therapies		No No
Current Post docs and Research Associates				
Ankit Sabharwal 2018-present	IGIB, Delhi, India	New mtDNA-based models of mitochondrial disease	Marriott Foundation Gift	No No
Bibekannanda Kar, PhD 2019-present	PhD, Indian Institute of Technology, Roorkee, India	Building the Mitochondrial Gene Editing Repertoire	U01 AI142773	No No
Maarten Rotmann, PhD 2019 – present	PhD, Neuroscience, Leiden University Medical Center, Leiden, the Netherlands	Research Associate – Mayo Clinic Office of Entrepreneurship - Florida	Entrepreneurial Education Manager, Mayo Clinic Florida, Office of Entrepreneurship	No No
Rena Hale, Ph.D. 2021-present	BS, LeTourneau U, Texas, 2011, PhD, Biomed Eng, U Texas at El Paso, 2016, Postdoc, Mayo clinic sports Med 2016-19, Postdoc, Mayo Clinic PMR, 2019-21.	Research Associate – Mayo Clinic Office of Entrepreneurship - Rochester	Research Assoc, Mayo Clinic Office of Entrepreneurship	Yes ??
Annapoorna Sreedhar, Ph.D. Research Associate 2021-present	BE, MV Institute of Tech and Indian Institute of Science, Bangalore, India, 2008-2012, PhD, Pharm, Toxicology,	Sr. Research Fellow Mayo Clinic Office of Entrepreneurship, Arizona	Entrepreneurial Education Coordinator, Mayo Clinic Arizona, office of Entrepreneurship	No No

	Neuroscience, LSU Health Sciences Center, Shreveport, LA 2013-2018			
Current GREP and PREP Students				
EKKER, Stephen Past Trainees				
Past Trainees				
Pete Strege 1997-2000	B.S., 1997, University of Minnesota TC	Effects of double- stranded RNA on Xenopus development	Scientist, Mayo Clinic, Rochester, MN	Yes No
Saulius Sumanas PhD 1995-2000	B.S., 1995, Vilnius University	Xenopus frizzled-7 is required for vertebrate axis specification	Postdoc, UCLA; Tenured Professor, Dept of Pathology and Cell Biology, University of South Florida, Tampa	No No
Aidas Nasevicius PhD 1996-2001	B.S., 1996, Vilnius University	Wnt signaling is early zebrafish development	Post-doc, Stanford; Chief Scientific Officer, Yorktown Technologies	No No
Ann E. Davidson PhD 1997-2004	B.S., 1997, University of Iowa	Efficient Gene Delivery and Expression in Zebrafish Using Sleeping Beauty Transposon	Post-doc, University Michigan; Beckman Foundation, NIH	Yes No
Hyon Kim MD/PhD 2001-2005	B.S., 1999, University of Minnesota	Role of wnt5/fz2 signaling in pancreas development	Residency, Cincinnati Children's	Yes No
Michael Pickart Postdoc 2002-2005	Ph.D., 2002, University of Wisconsin	Systematic Vertebrate Functional Genomics	Department Head and Associate Professor, University Wisconsin- Stout	Yes No
Sridhar Sivasubbu Postdoc 2002-2005	Ph.D., 2001, Manonmaniam Sundaranar University, Tirunelveli, India	Development of Gene- breaking Transposons for the Zebrafish	Associate Professor, Institute of Genomics and Integrative Biology, New Delhi, India	No No
Eleanor Chen MD/PhD 2000-2004	B.S., 1998, University of Washington	Vascular development in zebrafish	Current (2013): Assistant Professor Department of Pathology University of Washington	Yes No

Michelle Knowlton Postdoc 2004-2007	Ph.D., 2004, University of Ottawa	Development of the Morpholino Database	Curator, Jackson Labs; NIH	No No
Kirk Wangenstein MD/PhD 2002-2007	B.A., 2000, Northwestern	Development of transposon-based vectors for Alpha1 Antitrypsin Deficiency	Residency, University of Vermont, Faculty, University Pennsylvania; Alpha1 Foundation	Yes Yes
Mara Robu Postdoc 2003-2007	Ph.D., 2003, University of Wisconsin	Molecular mechanism of p53-mediated toxicity	Assistant Professor, St. Olaf, Postdoctoral Training Grant T32 DE007288-07	Yes No
Darius Balciunas Postdoc 2001-2007	Ph.D., 2000, Uppsala, Sweden	Enhancer and Gene Trapping in Zebrafish	Associate Professor, Temple University NIH R01 DA14546	No No
Anthony Person Postdoc 2004-2007	Ph.D., 2004, University of Arizona	Novel genes required for vertebrate kidney development	Scientist, R&D Systems T32 DE007288-07	Yes Yes
Shelly Myers M.S. 2006-2007	B.S., 2004, BYU	Gene breaking in zebrafish	NIH PPG CA65493; R01 DA14546	Yes No
Brent Bill Ph.D. 2002-2008	B.S., 2002, Iowa St.	Development of the zebrafish choroid plexus	Post doc, UCLA NIH T32 EY007133- 12; Associate Professor Department of Biology The University of Texas at Tyler	Yes No
Jun Ni Postdoc 2007-2010	Ph.D. University Michigan; post doc, Stanford	Structure Function of the Tol2 Transposon	NIH R01 DA14546; Stanford post doc	No No
Andrew Petzold Ph.D. 2006-2010	B.A., 2005, Hamline University	Genetics of behavioral sensitization in zebrafish	Associate Professor, Center for Learning Innovation, UMR; NIH R01 DA14546	Yes No
Karl Clark Postdoc; 2007-2010	Ph.D. University Minnesota	Developing a Codex for the Vertebrate Secretome	Associate Professor, Mayo Clinic; NIH R01 GM63904, DA14546	Yes No
Christopher Pierret Postdoc; Assistant Professor, Mayo 2008-2011	Ph.D. University of Missouri (Columbia)	Mechanisms of stem cell homing	Assistant Professor, Mayo Clinic; NIH PPG CA65493	Yes No
Kevin Neff 2010-2012	Ph.D. Mayo Clinic	TALEN Design Software Mojo Hand	NIH R01 DA14546	Yes No
Professor Henning Schneider	MS, Biology, U Konstanz, PhD, Neurobiology, U		DePauw U, Assoc Prof, 2003-11, Prof of Biology 2011-present	

Sabbatical Scientist 2009-2010	Konstanz, 1985-1990, Harvard Med School, Postdoc 1992-96, Instructor, 1996-97, Assist Prof, William Peterson U, 1997-2003			
Victoria Bedell MD/PhD (Mayo) 2008-2014	BS 2003 Bethell College	Molecular mechanism of action by ccp1 in kidney development	NIDDK F30 award; MSTP NIH grant; Residency, University Pennsylvania;	Yes No
Alvin Ma 2011-2013	PhD Univ Hong Kong	TALEN genome engineering tools	Assistant Professor University of Hong Kong Dept of Medicine	
Tyler H. Koep 2011-2014	BA 2009 Concordia College	Healthy Communities InSciEd Out	Post doc, U MN NIH CTS T32; Mayo Foundation; CSO OneOme	Yes No
Margot Cousin 2011-2015	Northern Michigan University, BS 2005 Mathematics, Diagnostic Genetics	Zebrafish as a tool to study nicotine addiction	NIH CTS T32; Research Associate, Mayo Clinic Mayo Foundation; NIH Fellowship	Yes No
Patrick Blackburn 2012-2015	University of Florida	Individualized Medicine	NIH CTS T32 Assistant Member Faculty, St. Jude's Children's Research Hospital	Yes No
Kamalakar Chatla 2014-15	Mississippi St PhD	Locus-specific epigenetic regulation	Dr. Russ Pieper UCSF; MN Partnership	No No
Greg Sindberg 2014-16	University of MN TC PhD	InSciEd Out	Mayo Foundation Senior Medical Writer, Medtronic	Yes No
Jarryd Campbell 2012-16	BS Concordia College	Genome engineering in zebrafish	NIH CTS T32; NIH R01 GM63904; UM/Mayo Partnership; Post Doc, University of Minnesota; Scientist, Recombinetics	Yes No
Stephanie Westcott Ph.D. 2006-2016	A.B., 2003, Princeton	Zebrafish Integument Project	NIH R01 DA14546; Mayo Foundation; Scientific writer, IDT; Junior Partner in training, Patent Attorney Patent Agent, Pierce Atwood LLP	Yes No

Joanna Yang Yowler 2013-2017 (collaborative student with Dr. C Pierret)	Arizona St	Evolution of Scientific Design	NIH CTS T32; NSF fellowship; post doc, Mayo Clinic Florida	Yes No
Noriko Umemoto/Ichino 2014-2020	Mie University PhD	Vertebrate Functional Genomics	NIH R01 GM63904	No No
Trupti Vardam-Kaur, PhD 2019-2021		Scholar – Mayo Clinic Office of Entrepreneurship-Arizona	Res Assoc, BMB, Mayo Clinic Arizona	? No
Stefan Madansingh, PhD 2019-2021	PhD, Kinesiology, U of Houston, Houston, TX	Scholar – Mayo Clinic Office of Entrepreneurship - Rochester	Assoc Tech IP Dev Mgr, Dept Business Development, Mayo Clinic	No No
Alaa Koleilat 2016-2020 (Collaborative student with Dr. Lisa Schimmenti)	MS University of Minnesota Twin Cities	Novel treatments and diagnostics for hearing loss	Resident, Mayo Clinic, Lab Genetics and Genomics	Yes Yes
Gabriel Martinez Galvez 2016-present	Colombia	Genomic applications of MMEJ-based gene editing	Concordia University in Montreal	No No
Hirotaaka Ata 2014-2019	BS, University of South Alabama, 2009	MMEJ-based Genome Engineering	MD/PhD, Mayo Clinic Alix School of Medicine, 2021, Duke University, 2021-present (anticipated completion 2014)	No No
William Gendron 2016-2021 (collaborative student with Dr Michael Barry)	Loyola Marymount, University, Los Angeles	In vivo targeted knockin for gene therapy	Postdoctoral Fellowship in Dr. Barry's lab at Mayo Clinic	Yes No
Brandon Simone 2018-2021	University of Buffalo	MSC programming for novel therapeutic development	Leah Labs, Rochester, MN 2021-2022; U Penn 2022	Yes No
Former GREP PREP				
Roberto Lopez Cervera PREP MOMSA 2014-2017	Santa Monica College, 2009-2012; Bachelor's degree, University of California at Santa Cruz, 2012-2014,		MD/PhD student at U MN Medical School, 2017-present	No No
Jake Bergren GREP student 2015-2017	BS, Genetics, Cell Biology and		Masters of Biotechnology, U Pennsylvania, 2017-	

	Development U MN, 2011-2015;		2019, Senior Marketing specialist, Merck, 2019-present	
Alexandra Cook GREP				
Kyle Schaeffbauer GREP 2016-2017	BS, Genetics, Iowa State University, 2012- 2016		Research Technologist, Thoracic Disease Research, Mayo Clinic, 2017-present	

Undergraduate Student Placement

Julie Guttman	Medical School (Israel)
Paul Judd	Graduate School (BMBB, UMN Twin-Cities)
Jenny Shaffer	Medical School (Mayo Clinic)
Hyon Kim	MD/PhD (UMN Twin Cities)
Erin Walsh	Medical School (Mayo Clinic)
Ken Finley	Graduate School (MCDB&G, UMN Twin-Cities)
Anna Kattan	Graduate School, Finland; Medical School, UMN TC
Cheryl Saunders	Graduate School, U. Washington
Dawn Demmon	Graduate School
Spencer Hermanson	Staff Scientist, Biotech
Paul Phelps	Fulbright student scholar
Mayo Clinic:	
Nicole Boczek	Graduate School, Mayo Clinic

Collaborative Graduate Students Graduates

Eric Mendenhall (with Catherine Verfaillie); Post-doc- Broad Institute, Boston.
 Dr. Brad Bernstein's lab (Fall 2006 start); Assistant Professor
 Jeff Ross (with Catherine Verfaillie); Industry scientist
 Melissa Rusch (with Scott Selleck)
 Shannon Buckley (with Catherine Verfaillie)
 Abhishek Sohni (with Catherine Verfaillie)

Collaborative Post-docs – All Using Zebrafish as Primary Model System

Anskar Leung (post doc co-trainee with Catherine Verfaillie) Assistant Professor,
 Hong Kong
 Sally Stringer (post-doc co-trainee with Dr. Scott Selleck) Assistant Professor,
 UK

Graduate Student Committees (since 2002)

University of Minnesota:

Geyi Liu
 Brigit Riley

Aron Guerts
John Ohlfest
Paula Bryan
Tania Schroeder
Craig Eckfeldt
John Ohlfest
Eric Mendenhall
Lucas Chase
Paul Grimsrud
Melissa Rusch
Mark Osborn
Shannon Buckley
Jeff Ross
Hyun-jin Yang
Sam Stevens
Neal Jahren
Julia Hatler
Adam Kleinschmit
YunHao Xu (IT)

Mayo Clinic:

Steven Henle
Amanda C. Leightner
Zheyang Chen
Tiffany Hoage
Tanya L. Poshusta (MS)
Faye R. Harris (MS)
Katherine A. Hartjes
Jenny Chen
Lucas P. Carlstrom
Saranya Purushothaman
Randy Krug
Ronee Harvey
Antoneicka Harris
Swati Kumar
Xiao Ma
Ryan Donohue
Sherri Biendarra
Kristin J. Mantz (MS)
Rhianna Urban (MS)
Elizabeth Dillinger
Aaron Rusheen
Robin M Heider

UM Master's:

Alaa Koleilat

Undergraduates (Mayo)

Jacki Rorabaugh (2008-9)
Vwaire Orhurhu (summer 2008)
Sunny Cam Huang (summer 2009, 2010) - NIH, Fall 2011
Nicole Joy Boczek (summer 2009); Mayo Grad School, Fall 2010
Samantha Gardner (summer 2010)
Peter Blanco Carcache (summer 2010)
Brittany Raab (summer 2011)
Curvelle Lewis (summer 2011)

Post-bacs:

Liz Luger (2010-11)
Roberto Lopez Cervera (2014-16)

Medical Student (Puerto Rico)

Christian Arroyo (summer 2008)
Lynette (Summer 2010)

Established the InSciEd Out Science Partnership between the Mayo Clinic and Rochester Public Schools - insciedout.org

Editor-in-chief of the Zebrafish; launched the Special Education Issues, Spring 2009;
Dec 2012

Mayo Clinic Ventures Invention Academy - 2015

Service [Institutional]**1995-96**

University of Minnesota Developmental Biology Symposium Committee

1996-97

University of Minnesota Developmental Biology Symposium Committee
Institute of Human Genetics Executive Committee

1997-98

University of Minnesota Developmental Biology Symposium Committee
Developmental Biology Faculty Search Committee (2 Faculty Positions)
Institute of Human Genetics Executive Committee

1998-1999

Institute of Human Genetics Executive Committee
GCD Graduate Teaching Committee
Genetics, Cell Biology and Development Executive Committee - Junior Faculty Rep

1999-2000

Director, Arnold and Mabel Beckman Center for Transposon Research
Institute of Human Genetics Executive Committee
Genetics, Cell Biology and Development Executive Committee - Junior Faculty Rep
IHG Faculty Search Committee

2000-2001

Director, Arnold and Mabel Beckman Center for Transposon Research
MD/PhD Steering Committee
Stem Cell Institute Faculty Search Committee
Developmental Biology Center Evening Seminar Coordinator
Medical School Development Planning Coordinator – Med School Retreat
CBS Computing Sciences Committee
Institute of Human Genetics Executive Committee

2001-2002

Director, Arnold and Mabel Beckman Center for Transposon Research
Institute of Human Genetics Executive Committee
MD/PhD Steering Committee
Developmental Biology Center Evening Seminar Coordinator
Harrison Chair Search Committee, co-chair
CBS Computing Sciences Committee
Medical School Team Leader – Developmental Biology and Child Health
Medical School Dean Search Committee
Integrated Work Group-Genetics
MD/PhD Director Search Committee

2002-2003

Director, Arnold and Mabel Beckman Center for Transposon Research

Associate Department Head, GCD
Institute of Human Genetics Executive Committee
MD/PhD Steering Committee
University Senate [re-elected for additional 3-year term]
Medical School Faculty Advisory Committee
Group Leader, Developmental Biology and Genetics, Minnesota Craniofacial
Research Training (MinnCResT) Program
GCD Stewardship Committee
IHG Fellowship Committee
AHC Screening Committee, Academy of Excellence
Medical School Research Council
Medical School Mission-Based Management Team – Research Subcommittee
Organizer, First International Conference on Transposition, 06/03

2003-2004

Director, Arnold and Mabel Beckman Center for Transposon Research
MinnCResT Program Steering Committee
Chemical Biology Institute Steering Committee
DBC Symposium Committee
Minnesota Nanotechnology Initiative Funding Work Group
[The following responsibilities were very limited during sabbatical]
Associate Department Head, GCD
Institute of Human Genetics Executive Committee
MD/PhD Steering Committee
University Senate
Medical School Faculty Advisory Committee
Medical School Research Council
Organizer, 2nd International Conference on Transposition and Animal Biotechnology,
06/04

2004-2005

Director, Arnold and Mabel Beckman Center for Transposon Research
MinnCResT Program Steering Committee
Chemical Biology Institute Steering Committee
Minnesota Nanotechnology Initiative Funding Work Group
Associate Department Head, GCD
Institute of Human Genetics Executive Committee
MD/PhD Steering Committee
University Senate
Medical School Faculty Advisory Committee
Medical School Research Council
Cancer Genetics Faculty Search Committee
Cancer Center Experimental Therapeutics Scientific Advisory Committee
Pediatric Dentistry Search Committee
Organizer, Nanotherapy Workshop 11/04
Organizer, 3rd International Conference on Transposition and Animal Biotechnology,
06/05
Basic Science representative to the Academic Health Center Faculty Consultative
Committee (July 1, 2005-June 30, 2008). Elected position.

2005-2006

UM Graduate School Grant-in-Aid Review Committee
Search Committee Member (first round of applications; participation ended Jan 2006):
Stem Cell Institute Director
Director, Arnold and Mabel Beckman Center for Transposon Research
MinnCResT Program Steering Committee
Chemical Biology Institute Steering Committee
Minnesota Nanotechnology Initiative Funding Work Group
Associate Department Head, GCD
Vertebrate Development Search Committee Member
Institute of Human Genetics Executive Committee
Medical Genetics Search Committee
MD/PhD Steering Committee
Medical School Faculty Advisory Committee
Medical School Research Council
Pediatric Dentistry Search Committee
Organizer, UM/Mayo Nanotherapy Workshop 11/05
Organizer, 4th International Conference on Transposition and Animal Biotechnology,
06/06
Basic Science representative to the Academic Health Center Faculty Consultative
Committee (July 1, 2005-June 30, 2008). Elected position.
Nanotechnology Planning Committee (Ad Hoc)
Strategic Positioning Committee Co-Chair: Graduate Reform: Discipline Evolution

2006-07

Director, Arnold and Mabel Beckman Center for Transposon Research
Co-Director, MinnCResT Program
Associate Department Head, GCD
Executive Director, The University of Minnesota Nanobiotechnology Initiative
Chemical Biology Institute Steering Committee
Institute of Human Genetics Executive Committee
Medical Genetics Search Committee
MD/PhD Steering Committee
Medical School Research Council
Organizer, 3rd UM/Mayo Nanotherapy Workshop 11/06
Organizer, 5th International Conference on Transposition and Animal Biotechnology,
06/07
Basic Science representative to the Academic Health Center Faculty Consultative
Committee (July 1, 2005-June 30, 2008). Elected position.
Translational Research Assistance Committee
University Senate Research Committee
Grant-in-Aid Review Committee
Nanotechnology Planning Committee (Ad Hoc)
Search Committee, GCD – Mobile DNA
Supercomputing Institute: MSI Support for Computation in Biomedical Sciences
Member, the Provost's Advisory Committee for the Institute for the Advancement of
Science and Technology

Strategic Positioning Committee Co-Chair: Graduate Reform: Discipline Evolution
Member UM Libraries Compact Review Consultative Group
Hosted 7th and 8th graders, LEGO nanoscience competition

2007-08

Molecular Genetics Core Course – zebrafish genetics lecture Mar 10, 2008
Search Committee, Institute of Ageing/BMB
CTSA Predoctoral Programs Committee
BMB Education Committee

2008-09

Molecular Genetics Core Course – zebrafish genetics lecture
CTSA Predoctoral Programs Committee
BMB Education Committee

2009-10

Molecular Genetics Core Course – zebrafish genetics lecture
CTSA Predoctoral Programs Committee
BMB Education Committee
BMB Journal Club course co-director
PKD Center Pilot Grants reviewer

2010-11

Molecular Genetics Core Course – zebrafish genetics lecture
CTSA Predoctoral Programs Committee
BMB Education Committee
BMB Journal Club course co-director
PKD Center Steering Committee Member
Director, Mayo Addiction Research Center
Director, Genetics Core, GI Cell Signaling Center
2011 VGT Gene Therapy Core Course June 14 2011 Homologous gene insertion and knockouts

2011-12

Research Space and Equipment Subcommittee
Mayo Clinic Green Committee
Molecular Genetics Core Course – zebrafish genetics lecture
CTSA Predoctoral Programs Committee
BMB Education Committee
BMB Journal Club course co-director
PKD Center Steering Committee Member
Director, Mayo Addiction Research Center
Director, Genetics Core, GI Cell Signaling Center
Mayo Clinic Career Development Study Section
2012 VGT Gene Therapy Core Course June 2012 Homologous gene insertion and knockouts
Course Director, BMB 8075 Epigenetics of Cancer and Addiction

2012-13

Research Space and Equipment Subcommittee
Mayo Clinic Green Committee
Molecular Genetics Core Course – zebrafish genetics lecture
CTSA Predoctoral Programs Committee
PKD Center Steering Committee Member
Director, Mayo Addiction Research Center
Director, Genetics Core, GI Cell Signaling Center
Mayo Clinic Career Development Study Section
2012 VGT Gene Therapy Core Course June 2012 Homologous gene insertion and knockouts

2013

Research Space and Equipment Subcommittee
Mayo Clinic Green Committee
Molecular Genetics Core Course – zebrafish genetics lecture
CTSA Predoctoral Programs Committee
PKD Center Steering Committee Member
Director, Mayo Addiction Research Center
Director, Genetics Core, GI Cell Signaling Center
Mayo Clinic Career Development Study Section
VGT Gene Therapy Core Course June Homologous gene insertion and knockouts
CTS Predoctoral Education Program Associate Director - in charge of PhD track (started April 2013)
MBL (Woods Hole) National Zebrafish Course Invited Teacher - August 2013
Course Director, BMB 8075 Epigenetics of Cancer and Addiction

2014

BMB Executive Committee
Research Space and Equipment Subcommittee
Mayo Clinic Green Committee
Molecular Genetics Core Course – zebrafish genetics lecture
CTSA Predoctoral Programs Committee
PKD Center Steering Committee Member
Director, Mayo Addiction Research Center
Director, Genetics Core, GI Cell Signaling Center
Mayo Clinic Career Development Study Section
VGT Gene Therapy Core Course June Homologous gene insertion and knockouts
CTS PhD Track Associate Director
BMB Search Committee - Stem cell biologist
Director, Model Systems Core, Mayo Clinic Translational Polycystic Kidney Disease (PKD) Center PKD
Member, Schedule 1 Agent Research Taskforce
MBL (Woods Hole) National Zebrafish Course Invited Teacher - August 2014
International Undiagnosed Disease Network - Founder scientist, 2014
RCR 6000 Discussion course Sept 4 2014

2015

BMB Executive Committee
Research Space and Equipment Subcommittee
Research Equipment Office Subcommittee
Mayo Clinic Green Committee
Molecular Genetics Core Course – zebrafish genetics lecture
CTSA Predoctoral Programs Committee
PKD Center Steering Committee Member
Director, Mayo Addiction Research Center
Director, Genetics Core, GI Cell Signaling Center
Mayo Clinic Career Development Study Section
VGT Gene Therapy Core Course Homologous gene insertion and knockouts
CTS PhD Track Associate Director
Director, Model Systems Core, Mayo Clinic Translational Polycystic Kidney Disease
(PKD) Center PKD
RCR 6000 Discussion course

2016

BMB Executive Committee
Research Space and Equipment Subcommittee
Research Equipment Office Subcommittee
Mayo Clinic Green Committee
Molecular Genetics Core Course – zebrafish genetics lecture
CTSA Predoctoral Programs Committee
PKD Center Steering Committee Member
Director, Mayo Addiction Research Center
Director, Genetics Core, GI Cell Signaling Center
Mayo Clinic Career Development Study Section
VGT Gene Therapy Core Course Homologous gene insertion and knockouts
CTS PhD Track Associate Director
Director, Model Systems Core, Mayo Clinic Translational Polycystic Kidney Disease
(PKD) Center PKD
RCR 6000 Discussion course
CTSC Clinical and Translational Science Course: Case Studies in Entrepreneurship
(CTSC 6150) Spring 2016; Fall 2016

2017

BMB Executive Committee
Research Space and Equipment Subcommittee
Research Equipment Office Subcommittee
Molecular Genetics Core Course – zebrafish genetics lecture
CTSA Predoctoral Programs Committee
PKD Center Steering Committee Member
Director, Genetics Core, GI Cell Signaling Center
Mayo Clinic Career Development Study Section
VGT Gene Therapy Core Course Homologous gene insertion and knockouts
CTS PhD Track Associate Director
Director, Model Systems Core, Mayo Clinic Translational Polycystic Kidney Disease

(PKD) Center PKD
RCR 6000 Discussion course
CTSC Clinical and Translational Science Course: Case Studies in Entrepreneurship
(CTSC 6150) Spring 2017; Fall 2017
Genomic engineering tools for engineering T cells lecture

2018

Director, Office of Entrepreneurship
BMB Executive Committee
CCATS Executive Committee
Research Equipment Office Subcommittee
Molecular Genetics Core Course – zebrafish genetics lecture
CTSA Predoctoral Programs Committee
PKD Center Steering Committee Member
Director, Genetics Core, GI Cell Signaling Center
VGT Gene Therapy Core Course - Homologous gene insertion and knockouts lecture
CTS PhD Track Associate Director; CTS WIP Course Director
Director, Model Systems Core, Mayo Clinic Translational Polycystic Kidney Disease
(PKD) Center PKD
RCR 6000 Discussion course
CTSC 6150 Clinical and Translational Science Course: Case Studies in
Entrepreneurship Spring 2018; Fall 2018
Core 6400 Genome Biology – Gene Editing Lectures (3)
Genomic engineering tools for engineering T cells lecture – Kenderian course

2019

Dean, Graduate School of Biomedical Sciences
Advisory Council, Executive Dean for Research
Director, Office of Entrepreneurship
BMB Executive Committee
CCATS Executive Committee
Molecular Genetics Core Course – zebrafish genetics lecture
CTSA Predoctoral Programs Committee
VGT Gene Therapy Core Course - Homologous gene insertion and knockouts lecture
RCR 6000 Discussion course
CTSC 6150 Clinical and Translational Science Course: Case Studies in
Entrepreneurship Course Director
Core 6400 Genome Biology – Gene Editing Lectures (3)
Genomic engineering tools for engineering T cells lecture – Kenderian course

2020

Dean, Graduate School of Biomedical Sciences
Advisory Council, Executive Dean for Research
Director, Office of Entrepreneurship
BMB Executive Committee
CCATS Executive Committee
Molecular Genetics Core Course – zebrafish genetics lecture

CTSA Predoctoral Programs Committee
VGT Gene Therapy Core Course - Homologous gene insertion and knockouts lecture
RCR 6000 Discussion course
Entrepreneurship Course Director:
 Entrepreneurship Course Director:
 CTSC 6150 Case Studies in Entrepreneurship: Fundamentals
 CTSC 6151 Financial Business Case
 CTSC 6152 Minimally Viable Product
Core 6400 Genome Biology – Gene Editing Lectures (3)
Genomic engineering tools for engineering T cells lecture – Kenderian course

2021

Dean, Graduate School of Biomedical Sciences
Advisory Council, Executive Dean for Research
Director, Office of Entrepreneurship
BMB Executive Committee
CCATS Executive Committee
Molecular Genetics Core Course – zebrafish genetics lecture
CTSA Predoctoral Programs Committee
VGT Gene Therapy Core Course - Homologous gene insertion and knockouts lecture
RCR 6000 Discussion course
Entrepreneurship Course Director:
 CTSC 6150 Case Studies in Entrepreneurship: Fundamentals
 CTSC 6151 Financial Business Case
 CTSC 6152 Minimally Viable Product
 CTSC 6153 SBIR/STTR
Core 6400 Genome Biology – Gene Editing Lectures (3)
Genomic engineering tools for engineering T cells lecture – Kenderian course

News items

<https://discoverysedge.mayo.edu/2019/07/02/dual-mentors-aid-students-quest-for-hearing-loss-drug/>

Zebrafish genetics and addiction science

<http://www.nida.nih.gov/newsroom/10/NS-09.html>

<http://addiction-dirkh.blogspot.com/2010/09/nicotine-and-humphrey-bogart-gene.html>

<http://discoverysedge.mayo.edu/zebrafish-genetics/>

<http://www.reuters.com/video/2011/11/08/addicted-zebrafish-recruited-in-fight-ag?videoid=224426875>

<http://www.youtube.com/watch?v=JLAF8JoFfEY>

<http://www.scientificamerican.com/video.cfm?id=addicted-zebrafish-recruited-in-2011-11-08>

InSciEd Out

<http://discoverysedge.mayo.edu/de09-3-science-education-snapshot.cfm>

<http://ctsa.mayo.edu/news/inscied-out.html>

<http://www.youtube.com/watch?v=NP8bUorZY00>

<http://mayo.img.entriq.net/hfm/single-640x480-player.html?articleID=5216>

2012 Education Special Issue:

<http://membercentral.aaas.org/blogs/stemedu/zebrafish-k-12-science-education>

This is the author's blog outside the firewall:

<http://marybatessciencewriter.wordpress.com/2013/01/29/new-on-aaas-zebrafish-in-science-education/>

Washington, DC 2011

Huffington Post

http://www.huffingtonpost.com/dr-douglas-fields-obamas-vision-of-national_b_826976.html

NPR

<http://topics.npr.org/article/0aQpdKcfjr8jw>

President Obama

<http://obamadress.info/2011/02/dr-douglas-fields-obamas-vision-of-national-security-science/>

Wall Street Journal

<http://onespot.wsj.com/politics/2011/02/23/1d20f/dr-douglas-fields-obamas-vision-of>

KTTC

<http://www.kttc.com/Global/story.asp?S=14079908>

Post-Bulletin

<http://www.postbulletin.com/news/stories/display.php?id=1445887>

<http://www.nsta.org/about/pressroom.aspx?id=58553>

<http://www.mprnews.org/story/2014/06/30/daily-circuit-science-comms?from=dc>

<http://tlabounty.edublogs.org/2014/07/03/future-scientists/#.U7VbbemIE68.twitter>

[Zebrafish at Mayo - 150 year celebration](#)

<https://www.youtube.com/watch?v=aXOPIbf4S9E>

<http://newsnetwork.mayoclinic.org/discussion/mayo-clinic-radio-95/>

<http://newsnetwork.mayoclinic.org/discussion/zebrafish-mayo-clinic-radio-health-minute/>

[BBC Influenza in schools](#)

<http://www.bbc.com/future/story/20151016-the-real-reason-germs-spread-in-the-winter>

[Walleye Tank](#)

<http://discoverysedge.mayo.edu/2016/08/04/reeling-in-the-next-big-medical-innovation/>

<http://newsnetwork.mayoclinic.org/blogtag/dr-stephen-ekker/>

[InSciEd Out Microscope](#)

http://www.postbulletin.com/news/local/lunchbox-microscope-puts-science-in-kids-hands/article_d3bbe795-2506-5d40-a7af-1950a27b8511.html

http://www.postbulletin.com/news/local/video-inscied-out-microscope-set-up/youtube_9500ec1c-0df1-11e8-9476-13a8969d397a.htm

<https://discoverysedge.mayo.edu/2021/09/14/scientists-teachers-partner-to-bring-science-experiences-to-students/>

Grad school

<https://advancingthescience.mayo.edu/2019/07/30/new-ph-d-students-pledge-to-uphold-biomedical-ethics-in-new-scientists-oath/>

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Entrepreneurship

<https://www.bloomberg.com/news/articles/2021-10-13/takeda-to-work-with-immusoft-in-900-million-rare-disease-deal>

<https://www.bloomberg.com/news/articles/2021-09-23/softbank-invests-in-robotics-company-behind-nyc-covid-testing>

<https://www.fiercebiotech.com/medtech/lab-platform-opentrons-closes-200m-series-c-to-build-out-robotics-diagnostics-cell>