CURRICULUM VITAE

NAME: Steven Marion Reppert
E-MAIL: Steven.Reppert@umassmed.edu
WEBSITES: http://www.umassmed.edu/neurobiology/faculty/reppert.cfm
http://reppertlab.org/

DEGREES:

1973 B.S. University of Nebraska, Omaha, NE
1973 M.D. University of Nebraska, College of Medicine, Omaha, NE
(with Distinction)
1993 M.A. Harvard University (Honorary)

POSTDOCTORAL TRAINING:

Internship and Residencies:

1973-1974 Pediatric Intern, Massachusetts General Hosp, Boston
1974-1976 Pediatric Resident, Massachusetts General Hosp, Boston

Fellowships:

1973-1976 Clinical Fellow, Harvard Medical School
1976-1979 Postdoctoral fellow in the Laboratory of David C. Klein, Section on Neuroendocrinology, National Institutes of Health, Bethesda, MD

ACADEMIC APPOINTMENTS:

2017- Distinguished Professor Emeritus, UMass Med School
2014-2017 Distinguished Professor of Neurobiology, UMass Med School
2001-2017 Higgins Family Professor of Neuroscience, UMass Med School
2001-2013 Professor of Neurobiology, UMass Med School
2001-2013 Founding Chair, Department of Neurobiology, UMass Med School
1993-2003 Professor, Harvard Medical School
1985-1993 Associate Professor, Harvard Medical School
1981-1985 Assistant Professor, Harvard Medical School
1979-1981 Instructor, Harvard Medical School

HOSPITAL APPOINTMENTS:

1983-2001 Director, Laboratory of Developmental Chronobiology, Massachusetts General Hospital

VISITING APPOINTMENTS:

2001- Pediatrician, Massachusetts General Hospital
1989-1990 Visiting Scientist, Lab of Molecular Neurobiology, MGH

AWARDS AND HONORS:

2016	Chancellor's Medal for Distinguished Scholarship, UMass Med
2014-	Distinguished Professor of Neurobiology, UMass Med School
2013	*Doctor honoris causa* (honorary doctorate) University of South Bohemia
2012	G.J. Mendel Honorary Medal for Merit in Biological Sciences from the Academy of Sciences of the Czech Republic
2011	Elected fellow, American Association for the Advancement of Science
2010-	CAnMove, Scientific Advisory Board
2001-2017	Higgins Family Professor of Neuroscience, UMass Med School
2002-2004	President, Society for Research on Biological Rhythms
1998	Chair, Gordon Conference on Pineal Cell Biology
1997-2016	*Neuron*, Associate Editor
1993	M.A. (honorary), Harvard University
1992-2002	NIH-NICHD MERIT Award
1989	E. Mead Johnson Award for distinguished research
1987	Elected member, American Association for Clinical Investigation
1985-1990	Established Investigator, American Heart Association
1981-1983	Basil O'Connor Early Scholar Award
1981-1984	Charles A. King Trust Research Fellow, Medical Foundation Inc
1980	Charles H. Hood Foundation Award
1973	M.D. with Distinction
1973	Alpha Omega Alpha Honor Medical Society

HONORIFIC LECTURES/LECTURESHIPS (**since 2000**)

2016 Keynote Address, UMassMed Annual Research Retreat
2015 Special Lecture, Society of Neuroscience Meeting, Chicago
2012 Presidential Symposium, Society for Research on Biological Rhythms
2012 Plenary Talk, 53rd Annual Drosophila Research Conference, Chicago
2012 Keynote Speaker, 2nd Annual Symposium in Brain, Behavior & Evolution, U of Texas at Austin
2011 The John G. Nicholls Endowed Lecture, Marine Biological Labs, Woods Hole
2010 UT San Antonio, Inaugural Keynote Lecture at graduate student retreat, Dept of Physiology
2010 Dupont Lecture on Invertebrate Neurobiology, U of Arizona
2010 Keynote Lecture, 15th Annual Symposium on Biotechnology Education, Museum of Science, Boston
2009 Inaugural Lecture, Mexican Society for Physiology, Morelia
2009 Plenary Lecture, European Pineal & Biological Rhythms Society Meeting, Strasburg
2006 NICHD Pioneer in Circadian Biology Lecture, NIH, Bethesda
2006 Mayer Lecture, Wellesley College

2005 Plenary Lecture, European Pineal & Biological Rhythms Society Meeting, Frankfurt
2005 Vanderbilt University MSTP Physician-Scientist Special Lecture
2004 Keynote Lecture, Behavior Club Symposium, Tufts University
2004 Featured Lecture, Hood Foundation Research Symposium, Boston
2004 Special Lecture, Society for Neuroscience Annual Meeting, San Diego
2004 Green College Thematic Lectureship, Images of the Cell, U of British Columbia
2004 Helen Jones Memorial Lecture, Massachusetts General Hosp
2002 Plenary Lecture, European Pineal & Biological Rhythms Society Meeting, Scotland
2002 Dolan Boyd Pritchett Memorial Lecture, U Penn, Dept Pharmacology
2000 Lecturer at Inaugural Symposium. Dept of Genetics, Dartmouth Medical School
2000 Plenary Lecture, FENS 2000, Brighton England

RESEARCH GRANTS (**as Principal Investigator**):

2010-2014 AFOSR FA9550-10-1-0480
2009-2011 NIH R01 GM086794-02S1
2008-2012 NIH R01 GM086794
2003-2008 NIH R01 NS047141
2003-2009 NIH R01 NS39303
1998-2001 NIH R01 GM55820
1997-2000 Research Grant of International Human Frontiers Science Program
1994-2000 Sponsored Research Agreement, Bristol-Myers Squibb
1993-1999 AFOSR F49620-97-1-004
1992-1993 Grant from Gensia Pharmaceuticals
1990-2000 NIH R01 DK42125
1990 Grant from Whitby Research
1986-1989 NIH R01 AM38116
1986-1987 Grant-In-Aid, American Heart Assoc
1985-1990 Established Investigatorship, American Heart Assoc
1984-1988 Basic Research Grants, March of Dimes
1983-1986 NIH R01 NS18755
1981-2002 NIH R01 HD14427 – converted to R27 MERIT Award last 10 yrs
1981-1985 Basil O'Connor Early Scholar Award, Natl Fnd March of Dimes
1981-1983 Charles King Trust Fellowship
1980 Milton Fnd
1980 Charles H. Hood Fnd

PATENTS (**as Principal Inventor**):

Pat. no. 5,516,894 A2b-Adenosine Receptor and Related Molecules and Methods
Pat. no. 5,856,124 DNA Encoding High-Affinity Melatonin Receptors

Pat. no. 5,889,177 Melatonin 1A Receptor Gene Regulatory Regions and Uses Thereof
Pat. no. 6,037,131 Melatonin 1a Receptor Gene Regulatory Regions and Uses Thereof
Pat. no. 6.326,526 Melatonin Receptor-Deficient Mice and Uses Thereof
Pat. no. 6,475,744 Methods for Identifying Compounds Which Modulate Circadian Rhythms
Pat. no. 7,081,349 High-affinity melatonin receptor and uses thereof

INVITED SYMPOSIA/SEMINARS (**Since 2000**)

2000 Dept of Genetics, U of Utah
Dept of Biochemistry, McMaster U
Florida State University Rushton Symposium on Biological Clocks,
Keystone Symposium, Genetic Basis of Brain Development and Dysfunction, Taos
Institute for Biomolecular Science, U South Florida,
GC Pineal Cell Biology, Cambridge
Royal Society Seminar on The Measurement of Time, London
Graduate Student Invited Speaker, Dept of Neurobiology, Yale

2001 Annenberg Center, Sleep Disorders Conference, Ranco Mirage, CA
UMass Boston, Dept of Biology Seminar
Keystone Symposium on Molecular Clocks, Tahoe City

2002 NIH Neuroscience Series, NINDS, Bethesda
Society for Research on Biological Rhythms, Amelia Island
GC Pineal Cell Biology, Ventura

2003 Baylor School of Medicine, Dept of Genetics
MBL lecture, Woods Hole
Mosbacher Kollooquim, The Rhythm of Live: Molecular Mechanisms of Circadian Clocks, Mosbach Germany
GC Chronobiology, Barga, Italy

2004 St. Jude Children's Research Hospital, Basic Science Talk
UCSF, Program in Neuroscience Seminar
U of Providence, Biology Dept
Pineal Cell Biology GC, Oxford

2005 Massachusetts General Hosp, Dept Molecular Biology
Women's Health Research Institute at Wyeth Research,
Merck Research Laboratories, West Point, PA
Yale, Dept of Cellular and Molecular Physiology

RCMI Symposium on Molecular approaches to Brain Function, City College, City University of NY, Dept of Biology

2006 International Symposium on Insect Genetics and Genomics, Hyderabad, India
Pineal Cell Biology Gordon Conference, Buellton, CA
U of New Hampshire, Zoology Dept
Society for Research on Biological Rhythms, Invited speaker, Sandestin,
Tufts University, Neuroscience Seminar Series
UNC seminar, Dept Mol Biol

2007 U Illinois Urbana, Dept Entomology
Boston U, Biology Dept
WWF forum on monarch butterfly conservation, Morelia, Mexico
HHMI Janelia Farms Symposium on Visual Processing in Insects
Cold Spring Harbor Symposium on Clocks and Rhythms
UC Irvine, Dept of Ecology and Evolutionary Biology

2008 Society for Research on Biological Rhythms, Invited speaker, Sandestin,
GC Neuroethology, Breaking news in insect neuroethology talk, Oxford
McGuire Center for Lepidoptera and Biodiversity, Gainesville, FL
UMass Medical School Research Retreat, Plenary talk, Woods Hole
Yale University, Dept of Ecology and Evolutionary Biology
U Virginia, Dept Biology, Grad Student invited speaker

2009 Royal Society Special Lecture on magnetoreception, London
The 11th International Symposium on Spin and Magnetic Field Effects in Chemistry and Related Phenomena, Ontario
UMass Amherst, Entomology Departmental Seminar
Evolution of vision workshop, Foundation des Treilles, France

2010 Clark University, Dept of Biology seminar
Brandeis University, Dept Biology Seminar
NIH/NIDDK Circadian Workshop, Bethesda
CIG Symposium on “Sensing the environment”, Lausanne
GC on Visual System Development, Barga, Italy.
Program in Gene Function and Expression, UMass Med School
Harvard Brain Science Center
Washington University St. Louis, Dept Biology seminar.
CAnMove Centre and Vision Group, U of Lund, Sweden

2011 Dept of Biology, U of North Carolina, Chapel Hill
CAnMove talk, U Lund, Sweden
Stanford Institute for Neuro-Innovation&Translational Neuroscience

2012 GC on Photosensory Receptors & Signal Transduction, Galveston,Texas
Program in Molecular Medicine, UMass Med School
U of Texas at Austin, Section on Integrative Biology
Baylor Medical Center, Houston, Neuroscience
U of Notre Dame, Dept of Biological Sciences
Cambridge Neuroscience, U of Cambridge, UK
European Clock Club, Keynote speaker, U of Edinburgh, UK
U of Leicester, Genetics Dept, UK
Small brains, Big ideas, Santiago, Chile (Outreach & Seminar Talks)
Case Western Reserve, Neuroscience & Biology
North Carolina State Keck Center Distinguished Speaker

2013 SICB Symposium, San Francisco
Cell Biology Seminar, UMass Medical School
UC Davis, Dept Entomology Seminar
Vienna BioCenter Seminar, Vienna
Faculty of Science, U of South Bohemia
Czech Academy of Sciences, Institute of Organic Chemistry and Biochemistry of the Academy of Sciences, Prague
Czech Academy of Sciences, Institute of Physiology, Prague
Physics-Biology Colloquium, U of Miami
Janelia Conference: Sensory Signaling in Model Organisms
Champalimaud Neuroscience Symposium, Lisbon, Portugal
Vanderbilt U, Dept of Biology
Cornell U, Dept of Ecology and Evolutionary Biology

2014 U of Washington, Dept of Pharmacology
EMF Trust Workshop, London
UCSD Center for Chronobiology Symposium
U of Illinois, Urbana-Champaign, Dept of Entomology
International Conference on the Biology of Butterflies (Keynote talk), Turku, Finland
Harvard Medical School, Dept of Neurobiology
UMass Boston, Dept of Biology

2015 Arizona State, School of Life Sciences
CAnMove talk, U Lund, Sweden
MIT, Molecular and Cellular Neuroscience Seminar
Wild Clocks, Wadden Island of Texel, the Netherlands
U of Kentucky, Dept of Entomology

2016 U of Utah, Dept of Biology
Plenary Lecture, UMassMed Research Retreat

2017 GC on Animal Movement, Ventura, CA

GC on Neuroethology, Switzerland
European Society for Evolutionary Biology, Groningen, The Netherlands
Ascona Meeting on Neural Circuits, Ascona, Switzerland
U of Indiana, Dept of Biology
UVA, Dept of Biology
UConn, Dept of Neurobiology

2018 Salk-IPSEN Symposium

SYNOPSIS OF MAJOR RESEARCH CONTRIBUTIONS

- Defined the field of fetal circadian clocks using physiological, metabolic and molecular techniques.

Reppert SM, Schwartz WJ. Maternal coordination of the fetal biological clock in utero. ***Science*** 1983; 220:969-971.

Reppert SM, Schwartz WJ. The suprachiasmatic nuclei of the fetal rat: Characterization of a functional circadian clock using [^{14}C]-labeled deoxyglucose. ***J Neurosci*** 1984; 4:1677-1682.

Reppert SM, Schwartz WJ. The maternal suprachiasmatic nuclei are necessary for maternal coordination of the developing circadian system. ***J Neurosci*** 1986; 6:2724-2729.

Weaver DR, Rivkees SA, Reppert SM. D1-dopamine receptors activate c-fos expression in the fetal biological clock. ***Proc Natl Acad Sci USA*** 1992; 89:9201-9204.

- Cloned a family of G-protein coupled receptors for the pineal hormone melatonin in mice, humans, birds and zebrafish. Designed gene targeting strategies for the two mouse receptors and reported results of functional studies. Melatonin has been used to treat jet lag and sleep disorders to which the cloning of the mammalian receptors has contributed.

Ebisawa T, Karne S, Lerner MR, Reppert SM. Expression cloning of a high-affinity melatonin receptor for *Xenopus* dermal melanophores. ***Proc Natl Acad Sci USA*** 1994; 91:6133-6137.

Reppert SM, Weaver DR, Ebisawa T. Cloning and characterization of a mammalian melatonin receptor that mediates reproductive and circadian responses. ***Neuron*** 1994; 13:1177-1185.

Reppert SM, Godson C, Mahle CD, Weaver DR, Slaugenhaupt SA, Gusella, JF. Molecular characterization of a second melatonin receptor expressed in human retina and brain: The Mel$_{1b}$-melatonin receptor. ***Pro Natl Acad Sci USA*** 1995; 92, 8734-8738.

Reppert SM, Weaver DR, Godson C, Cassone VM, Kolakowski, LF. Melatonin receptors are for the birds: Molecular analysis of two receptor subtypes differentially expressed in chick brain ***Neuron*** 1995; 15, 1003-1015.

Reppert SM, Weaver DR, Mahle CD, Kolakowski, LF. Cloning of a melatonin-related receptor from human pituitary. ***FEBS Lett*** 1996; 386, 219-224.

Roca AL, Godson C, Weaver DR, Reppert SM. Structure, characterization and expression of the gene encoding the mouse Mel_{1a} melatonin receptor. ***Endocrinology*** 1996; 137, 3469-3477.

Weaver DR, Liu C, Reppert SM. Nature's knockout: The Mel_{1b} melatonin receptor is not necessary for reproductive and circadian responses in the Siberian hamster ***Mol Endocrinol*** 1996; 10, 1478-1487.

Liu C, Weaver DR, Jin X, Shearman LP, Pieschl RL, Gribkoff VK, Reppert SM. Molecular dissection of two distinct actions of melatonin on the suprachiasmatic circadian clock. ***Neuron*** 1997; 19, 91-102.

- Discovered that the circadian clock mechanism in the mammalian suprachiasmatic nucleus (SCN), the site of the master brain clock, is cell autonomous (i.e., contained within single cells), using clever electrophysiological approach for monitoring individual neurons in culture.

Welsh DK, Logothetis DE, Meister M, Reppert SM. Individual neurons dissociated from rat suprachiasmatic nucleus express independently phased circadian firing rhythms. ***Neuron*** 1995; 14:697-706.

Liu C, Weaver DR, Strogatz SH, Reppert SM. Cellular construction of a circadian clock: period determination in the suprachiasmatic nuclei. ***Cell*** 1997; 91, 855-860.

Liu C, Reppert SM. GABA synchronizes clock cells within the suprachiasmatic circadian clock. ***Neuron*** 2000; 25, 123-128.

- Presented the "breakout" sequence of the clock gene period in silkmoth, which aided the initial cloning of mammalian Period homologs.

Reppert SM, Tsai T, Roca A, Sauman I. Cloning of a structural and functional homolog of the circadian clock gene *period* from the giant silkmoth *Antheraea pernyi*. ***Neuron*** 1994; 13:1167-1176.

- Defined the functions of clock genes which encode PERIOD2 and PERIOD3 in the mouse clockwork.

Shearman, LP, Zylka MJ, Weaver DR, Kolakawski Jr LF, Reppert SM. Two *period* homologs: Circadian oscillations and photic regulation in the suprachiasmatic nuclei. ***Neuron*** 1997; 19, 1261-1269.

Zylka MJ, Shearman LP, Weaver DR, Reppert SM. Three period homologs in mammals: Differential light regulation in the suprachiasmatic circadian clock and oscillating transcripts outside of brain. ***Neuron*** 1998; 20, 1103-1110.

Bae K, Jin X, Maywood ES, Hastings MH, Reppert SM, Weaver DR. Differential functions of mPer1, mPer2 and mPer3 in the SCN circadian clock. ***Neuron*** 2001; 30, 525-536.

- Defined a general molecular mechanism used for regulating clock-controlled genes in mammals.

Jin X, Shearman LP, Weaver DR, Zylka MJ, De Vries GJ, Reppert SM. A molecular mechanism regulating rhythmic output from the suprachiasmatic circadian clock. ***Cell*** 1999; 96, 57-68.

- Discovered the function of CRYPTOCHROMES, as essential clock genes, within the mammalian circadian clock.

Kume K, Zylka MJ, Sriram S, Shearman LP, Weaver DR, Jin X, Maywood ES, Hastings MH, Reppert SM. mCRY1 and mCRY2 are essential components of the negative limb of the circadian clock feedback loop. ***Cell*** 1999; 98, 193-205.

- Defined interlocking transcriptional feedback loops in the mouse clockwork.

Shearman LP, Sriram S, Weaver DR, Maywood ES, Chaves I, Zheng B, Kume K, Lee CC, van der Horst, GTJ, Hastings MH, Reppert SM. Interacting molecular loops in the mammalian circadian clock. ***Science*** 2000; 288, 1013-1019.

- Described post-tranlational mechanisms that regulate the mammalian circadian clock by developing specific antibodies against the major mouse clock proteins and performing chromatin immunoprecipitation experiments.

Lee C, Etchegaray J-P, Cagampang FRA, Loudon ASI, Reppert SM. Post-translational mechanisms regulate the mammalian circadian clock. ***Cell*** 2001; 197, 855-867.

Lee C, Weaver DR, Reppert SM. Direct association between mouse PERIOD and CKIE is critical for a functioning circadian clock. ***Mol Cell Biol*** 2004; 24, 584-594.

- Defined the importance of rhythmic histone acetylation in the mammalian clockwork and proposed the existence of a "histone code" for the clockwork. A cottage industry of chromatin regulation of clock gene expression has sprung from this study.

Etchegaray JP, Lee C, Wade PA, Reppert SM. Rhythmic histone acetylation underlies transcription in the mammalian circadian clock. ***Nature*** 2003; 421, 177-182.

- Showed that CLOCK and NPAS2 have overlapping roles in the suprachiasmatic circadian clock but that peripheral oscillators require CLOCK only.

DeBruyne JP, Noton E, Lambert CM, Maywood ES, Weaver DR, Reppert SM. A clock shock: mouse clock is not required for circadian oscillator function. ***Neuron*** 2006; 50, 465-477.

DeBruyne JP, Weaver DR, Reppert SM. CLOCK and NPAS2 have overlapping roles within the suprachiasmatic circadian clock. ***Nature Neurosci*** 2007; 10, 543-545.

DeBruyne JP, Weaver DR, Reppert SM. Peripheral circadian oscillators require CLOCK. ***Curr Biol*** 2007; 17, R538-R539.

- Discovered and characterized a family of vertebrate-like CRYPTOCHROMES in insects, revolutionizing the function of CRYs in non-drosophilid insects.

Zhu H, Yuan Q, Briscoe AD, Froy O, Casselman A, Reppert SM. The two CRYs of the butterfly. ***Curr Biol*** 2005; 15, R953-R954.

Yuan Q, Metterville D, Briscoe AD, Reppert SM. Insect cryptochromes: Gene duplication and loss define diverse ways to construct insect circadian clocks. ***Mol Biol Evol*** 2007; 24, 948-955.

- Defined components of time-compensated sun compass orientation in migrating monarch butterflies.

Froy O, Gotter AL, Casselman AL, Reppert SM. Illuminating the circadian clock in monarch butterfly migration. ***Science*** 2003; 300, 1303-1305.

Reppert SM, Zhu H, White R. Polarized light helps monarch butterflies navigate. ***Curr Biol*** 2004; 14, 155-158.

Merlin C, Gegear RJ, Reppert SM. Antennal circadian clocks coordinate sun compass orientation in migratory monarch butterflies. ***Science*** 2009; 325: 1700-1704.

Heinze S, Reppert SM. Sun compass integration of skylight cues in migratory monarch butterflies. ***Neuron*** 2011; 69, 345-358.

Heinze S, Reppert SM. Anatomical basis of sun compass navigation I: The general layout of the monarch butterfly brain. ***J Comp Neurol*** 2012; 520:1599-1628.

Guerra PA, Merlin C, Gegear RJ, Reppert SM. Discordant timing between antennae disrupts sun compass orientation in migratory monarch butterflies. ***Nat Commun*** 2012; 3:958.

Heinze S, Florman J, Asokaraj S, el Jundi B, Reppert SM. Anatomical basis of sun compass navigation II: The neuronal composition of the central complex of the monarch butterfly. ***J Comp Neurol*** 2013; 521:267-298.

Guerra PA, Reppert SM. Coldness triggers northward flight in re-migrant monarch butterflies. ***Curr Biol*** 2013; 5:419-423.

- Discovered and defined a novel circadian clock mechanism in lepidopterans.

Sauman, I., Reppert SM. Circadian clock neurons in the silkmoth *Antheraea pernyi*: Novel mechanisms of *period* protein regulation. ***Neuron*** 1996; 17, 889-900.

Sauman I, Briscoe AD, Zhu H, Shi D, Froy O, Stalleicken J, Yuan Q, Casselman A, Reppert SM. Connecting the navigational clock to sun compass input in monarch butterfly brain. ***Neuron*** 2005; 46, 457-467.

Zhu H, Sauman I, Yuan Q, Casselman A, Emery-Le M, Emery P, Reppert SM. Cryptochromes define a novel circadian clock mechanism in monarch butterflies that may underlie sun compass navigation. ***PLoS Biol***. 2008; 6, e4.

- Produced a brain expressed sequence tag database for monarch butterflies, performed expression profiling between summer and migratory monarchs, and initiated sequencing of monarch butterfly genome.

Zhu H, Casselman A, Reppert SM. Chasing migration genes: A brain expressed sequence tag resource for summer and migratory monarch butterflies (*Danaus plexippus*). ***PLoS One*** 2008; 3, e1293.

Zhu H, Gegear RJ, Casselman A, Kanginakudru S, Reppert SM. Defining behavioral and molecular differences between summer and migratory monarch butterflies. ***BMC Biol*** 2009; 7:14.

- Provided first genetic evidence that cryptochrome is essential for magnetosensitivity in any animal and that both the Drosophila-type CRY and vertebrate-type CRY can mediate light-sensitive magnetosensitivity using transgenic Drosophila.

Gegear RJ, Casselman A, Waddell S, Reppert SM. Cryptochrome mediated light-dependent magnetosensitiivty in *Drosophila*. ***Nature*** 2008; 454, 1014-1018.

Gegear RJ, Foley LE, Casselman, A, Reppert SM. Animal cryptochromes mediate magnetoreception through an unconventional photochemical mechanism. ***Nature*** 2010; 463, 804-807.

- Presented the draft sequence of the monarch butterfly genome, the first genome of a butterfly and of a long-distance migrating species.

Zhan S, Merlin C, Boore JL, Reppert SM (2011). The monarch butterfly genome yields insights into long-distance migration. ***Cell*** 147:1171-1185.

Zhan S, Reppert SM (2013). MonarchBase: the monarch butterfly genome database. ***Nucl Acid Res*** doi: 10.1093/nar/gks1057.

- Developed a high efficiency gene targeting strategy in the Monarch butterfly using zinc finger nucleases that is applicable to other lepidopterans.

Merlin C, Beaver LE, Taylor OR, Wolfe SA, Reppert SM (2013). Efficient targeted mutagenesis in the monarch butterfly using zinc finger nucleases. ***Genome Res*** 23:169-180.

- Showed that migratory monarch can use an inclination magnetic compass for navigation on overcast days.

Guerra PA, Gegear RJ, Reppert SM (2014). A magnetic compass aids monarch butterfly migration. ***Nat Commun*** 5:4164

- Defined the evolutionary history of the monarch migration.

Zhan S, Zhang W, Niitepõld K, Hsu J, Haeger F, Zalucki MP, Altizer S, de Roode JC, Reppert SM, Kronforst MR (2014). The genetics of monarch butterfly migration and warning coloration. ***Nature*** 514:317-321.

- Modeling the time-compensated sun compass.

Shlizerman E, Phillips-Portillos J, Forger DB, Reppert SM (2016). Neural integration underlying a time-compensated sun compass in the migratory monarch butterfly. ***Cell Rep*** 15:683-691.

OUTREACH/NEWS ITEMS (since 2003)

See: http://reppertlab.org/newsoutreach/