

CURRICULUM VITAE

NAME	TITLE	BIRTHDATE
Richard M. Schultz	Charles and William L Day Distinguished Professor Emeritus of Biology	March 20, 1949

TELEPHONE: 267-239-3515
e-mail: rschultz@sas.upenn.edu

EDUCATION

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	AREA
Brandeis University, Waltham, MA	B.A.	1971	Biology
Harvard University, Cambridge, MA	Ph.D.	1975	Biochemistry

RESEARCH/PROFESSIONAL EXPERIENCE

2017-present	Research Professor	UC, Davis
2016-2017	Visiting Professor	UC, Davis
2016-present	Charles and William L. Day Distinguished Professor Emeritus of Biology	U. of Penn
2008-2014	Associate Dean for the Natural Sciences	U. of Penn
2004-2008	Chair, Department of Biology	U. of Penn
2007-2016	Charles and William L. Day Distinguished Professor of Biology	U. of Penn
2001-2007	Patricia Williams Term Chair	U of Penn
1990-1995	Chair, Biology Graduate Group	U. of Penn
1990-present	Professor of Biology	U. of Penn
1984-1990	Associate Professor of Biology	U. of Penn
1978-1984	Assistant Professor of Biology	U. of Penn
1975-1978	Post-Doctoral Fellow of the Rockefeller Foundation	Harvard Medical School, in the lab of Paul Wassarman

HONORS

Recipient of the Jan Purkinje Medal from The Czech Academy of Sciences (1994)
Elected Fellow of AAAS (1996)
NIH MERIT Award (1997-2007)
Director, Society for the Study of Reproduction (2001-2004)
Visiting Scholar, The Jackson Lab (2003)
Society for Reproduction and Fertility Research Award (2005)
Chair, Scientific Advisory Board, Max Planck Institute for Molecular Biomedicine in Münster (2006-2014)
Recipient of the Society for the Study of Reproduction Research Award (2009)
Vice-President, Society for the Study of Reproduction (2013-2014)
President, Society for the Study of Reproduction (2014-2015)
Recipient of Frontiers in Reproduction Pioneer Award (2015)

CURRENT GRANT SUPPORT

5 RO1 HD022681-26A1 (Schultz) 07/01/13 – 04/03/2018 1.8 Calendar months
NIH/NICHD \$200,000 (Annual direct costs)
Gene Expression in Preimplantation Embryo

The major goals of this project are to determine the molecular basis for the reprogramming of gene expression that accompanies the maternal-to-zygotic transition, as well as the underlying causes for changes in the spatial pattern of gene expression present in the blastocyst.

1 R01 HD058730-01A1 (Schultz/Lampson) 08/01/2009 – 06/30/2020 1.8 Calendar months
NIH/NICHD \$199,999 (Annual direct costs)

Age-Associated Decline in Egg Quality: Mechanisms Contributing to Aneuploidy

The major goals of this project are to examine whether eggs derived from old mice exhibit a weakened Spindle Assembly Checkpoint and deficiencies in spindle microtubule-kinetochore attachments as an underlying source of the age-associated increased incidence in aneuploidy in females.

1 RO1 HD092266 (Bartolomei/Schultz) 07/01/2017-06/30-2022
NIH/NICHD \$200,000 (Annual direct costs)
Long-term physiological and behavioral outcomes epigenetic profiles and multigenerational phenotypes in a mouse ART model

The major goals of this grant are to determine the effects of procedures used in treatment of human infertility that effect gene expression in the placenta/embryo on metabolism and behavior in offspring. Note that for strategic reasons I receive no salary support from this grant but am fully engaged in the project.

COLLABORATIONS

Michael Lampson (Department of Biology, School of Arts and Sciences, University of Pennsylvania); the collaboration addresses the cellular basis for the increase in the incidence of aneuploidy associated with increasing maternal age and meiotic drive.

Brian Gregory (Department of Biology, School of Arts and Sciences, University of Pennsylvania); the collaboration involves studying the regulation of mRNA degradation during oocyte maturation in mouse.

Marisa Bartolomei (Department of Cell and Developmental Biology, Perelman School of Medicine, University of Pennsylvania); the collaboration focuses on regulation of expression of imprinted genes during early mammalian development and the effect of procedures used to treat human infertility on gene expression, including imprinted genes.

Ralph Meyer (School of Veterinary Medicine, Utah State University): the collaboration centers on how histones retained during spermatogenesis influence expression of those histone-associated genes in the preimplantation embryo.

Petr Svoboda (Institute of Molecular Genetics, Czech Republic); the collaboration examines the function of small RNAs in oocyte and preimplantation embryo development.

Carmen Williams (NIEHS); the collaboration explores the role of calcium oscillations in egg activation in mouse.

Pablo Ross (Department of Animal Science, UC Davis): the collaboration focuses on the role of maternal recruited *Ezh2* mRNA in development of the transcriptionally repressive state during the course of genome activation and the role of miRNAs in bovine preimplantation development.

Jeremy Wang (School of Veterinary Medicine, University of Pennsylvania); the collaboration focuses on the role of adenine methylation of mRNA on mRNA stability.

TEACHING EXPERIENCE

Primary instructor in following courses:

Introductory course in cell and molecular biology (Biology 103, now Biology 121, 1979-1982, 1985)

Intermediate level in course in biochemistry (Biology 402, 1982-1990, 1994-1999, 2006)

Advanced level course in developmental biology (Biology 481, 1981-1986)

Advanced Developmental Biology Seminar (Biology 755, 1985-1991)

Advanced Developmental Biology course for graduate students (Biology 601, 1991 and 1992)

Introductory course in Developmental Biology (Biology 204, 1991-1993)

Introductory Biology (Biology 101, 1992)

Cell Biology and Biochemistry (Biology 202, 1993-2004, 2006-2015)

Mammalian Development (Biology 609, 1995-1996)

Developmental Biology (Biology 354, 2002-2006)

ADMINISTRATIVE EXPERIENCE AND FACULTY RESPONSIBILITIES

Member of Executive Committee in the Department of Biology (1979-1981)

Member of Search Committee for position in Department of Biology (1980)

Member of Biology Graduate Group Admissions Committee (1980-present, Chairman, 1986-1990) and Biomedical Graduate Studies (1989-1990)

Member of Biology Graduate Student Advising Committee (1985-1990) and Chair (2000-present)

Member of Biology Graduate Student Comprehensive Exam Committee (1982-present)

Member of Undergraduate Curriculum Committee (1982, 1985)

Member of Department Seminar Selection Committee (1983-1984)

Organizer of Symposium on Current Concepts in Cell Biology for the Delaware Faculty Exchange Program (1985)

Member of Biology Graduate Group (1979-present)

Member of Cell and Molecular Biology Graduate Group (1987-present)

Member of Cell and Molecular Biology Training Grant (T32-GM-07229)(1979-present)

Member of Analysis of Development Training Grant (T32-HD-07067)(1985-present)

Member of Reproductive Biology Training Grant (T32-HD 07305)(1987-present)

Member of Selection Committee of University Institute of Aging (1983-1985)

Member of Program Committee of Cell Biology Graduate Group (1987-present)

Member of Organizing Committee for Bugher Annual Symposium on Biomedical Science (1988)

Member of Cell Biology Graduate Group Developmental Biology Seminar Series (1988)
Member of Selection Committee for William Penn Fellowships (1989-present)
Member of Search Committee for Plant Biochemist (1988-1989)
Member and Chairman of Search Committee for Trustee Professor (1990-1991f)
Member of Advisory Committee for Franklin Institute of Science project on Walk-in-Cell Exhibit (1988-1989)
Member of Grant Application Committee for Howard Hughes Undergraduate Initiative Program (1988-1989)
Member of Departmental Space Committee (1988-1990)
Organizer of Departmental Application to University Research Facilities Development Fund for Core Facility for DNA Sequencing and Analysis (1988)
Chairman, Biology Graduate Group (1990-1995)
Member of Executive Committee for Analysis of Development Training Grant (1990-1994)
Member and Chair of Departmental Application for b-Phosphor Image Analysis System (1992, 1993)
Moderator, Analysis of Development Training Grant sponsored symposium on "Cellular Interactions during Early Development" (1991)
Consultant, Department of Anatomy Faculty Search for Developmental Biologist (1992)
Member, ULAR Oversight Committee (1992-present)
Organizer of Departmental Application to University Research Facilities Development Fund for Core Facility for b-Phosphor imager (1993)
Member, University Personnel Committee (Committee on Appointments and Promotions) (1994-1996; Chair Natural Sciences Subpanel, 1995-1996)
Member, Task Force on Human Pre-Embryo Research (1995)
Member, Internal Review Committee for the IVF Program associated with the Department of Obstetrics and Gynecology (1995)
Member, BGS Curriculum Committee (1995-1997)
Member, Searle and Pew Scholars Program review committee (1996-present)
Member, Search Committee for Jones Chair, School of Veterinary Medicine (1997-1998)
Member, SAS Graduate Education Committee (1997-1999)
Member, Nassau Research Fund Selection Committee for Undergraduates (1997-1998)
Member, Rose Award Selection Committee (1998-2000)
Member, Biology Graduate Group Advising Committee (1997-present)
Member, Graduate Council of the Faculties (1998-1999)
Chair, Search Committee for Director of Office of Regulatory Affairs (1999)
Member, Selection Committee for HHMI Nominations (1999)
Member, Selection Committee for Center for Research on Reproduction and Women's Health Award (1999, 2001-2002)
Member, Search Committee for Reproductive Biologist at New Bolton Center, School of Veterinary Medicine (2000-2001)
Member, Scientific Advisory Committee for the Center for Animal Transgenesis and Germ Cell Research, School of Veterinary Medicine (2000-present)
Member, Executive Committee for Cell and Molecular Biology Graduate Group (2001-present)
Program Director, Cell and Molecular Biology Training Grant (2000-present)
Member, Search Committee for ULAR Director (2002-2003)
Member, Selection Committee for Packard Foundation Nominations (2002, 2003)
Member, Selection Committee for Pew Scholar Nominations (2002)

Member, Search Committee for new BGS Director (2003-2004)
Tobacco Fund Grant Selection Committee (2004)
Member, Search Committee, Department of Animal Biology, SOVM (2004)
Member, Animal Program Oversight Committee (2001-2014)
Member, Expression Profiling Oversight Committee (2003-2012)
Member, Transgenic and Chimeric Mouse Facility Advisory Committee (2004-present)
Member, Stem Cell Biology Planning Committee (2005-present)
Member, SAS Planning and Priorities Committee (2005-2014)
Chair, Search Committee for Vice-Provost of Research (2006)
Member, Executive Committee for the Institute of Stem Cell Biology and Regenerative
Medicine (2007-present)
Member, Provost Council on Research (2007-2014)
Member, Animal Research Committee (2012-2014)
Member, Internal Advisory Committee for UC Davis CounterACT U54 grant (2014-
present)

MEMBERSHIP IN SCIENTIFIC SOCIETIES

AAAS

Society for the Study of Reproduction

SEMINARS PRESENTED SINCE 1998

Meetings/Symposia

(Due to my administrative responsibilities from 2004-2014, I substantially reduced my traveling to attend meetings and present seminars.)

Frontiers in Reproduction Symposium, MBL, Woods Hole, MA (1998)
Annual Meeting of the Society for the Study of Reproduction, College Station, TX
(1998)
Gordon Conference on Mammalian Gametogenesis and Embryogenesis, New
Hampshire (1998)
Testis Workshop, Louisville, KY (1999)
Gordon Conference on Fertilization and Egg Activation, Holderness, NH (1999)
Annual Meeting of the Society for Reproductive Medicine, Toronto, Canada (1999)
Spallanzani Symposium, Pavia, Italy (1999)
Banbury Conference on Mammalian Cloning: Biology and Practice, Cold Spring Harbor
Laboratory, NY (2000)
Annual Meeting of the Society for the Study of Reproduction, Madison, WI (2000)
Frontiers in Reproduction, Boston, MA (2001)
Annual Meeting of the Society for the Study of Reproduction, Ottawa, Ontario, Canada
(2001)
Alpha 2001, New York, NY (2001)
10th Annual Winter Meeting of the Reproductive Biologists of Quebec, Quebec, Canada
(2002)
FASEB, Symposium on Fetal Origins of Adult Disease, New Orleans, LA (2002)
Frontiers in Reproduction, Woods Hole, MA (2002)
Gordon Conference on Mammalian Gametogenesis and Embryogenesis, New London,
CT (2002)

State-of-the-Art Lecture, Canadian Fertility and Andrology Society, Quebec, Canada (2002)

American Society of Andrology, Phoenix, AZ (2003)

Frontiers in Reproduction, MBL, Woods Hole, MA (2003)

Plenary Lecture, Second World Congress on Fetal Origins of Adult Disease, Brighton, UK (2003)

Symposium on New Frontiers in ART, Endocrine Society, Philadelphia, PA (2003)

Gordon Conference on Fertilization and Egg Activation, Holderness, NH (2003)

Reproduction 2003, NIH, Bethesda, MD (2003)

Society for Gynecological Investigation, Houston, TX (2004)

American Association of Bioanalysts, Las Vegas, NV (2004)

Frontiers in Reproduction, Woods Hole, MA (2004)

Gordon Conference on Mammalian Gametogenesis and Embryogenesis, New London, CT (2004)

Ovarian Workshop, Vancouver, British Columbia, Canada (2004)

Microarray Workshop, Temple University, Philadelphia, PA (2004)

American Society for Reproductive Medicine, Philadelphia, PA (2004)

Society of Reproduction and Fertility, Warwick, United Kingdom (2005)

Frontiers in Reproduction, Woods Hole, MA (2005)

Teratology Society Annual Meeting, St. Pete Beach, FL (2005)

State of the A.R.T., ESHRE meeting, Copenhagen, Denmark (2005)

17th Annual Aspen Conference on Maternal-Neonatal-Reproductive Medicine, Aspen, CO (2005)

Distinguished Scientist Lecture, University of Ottawa Faculty of Medicine, Ottawa, Canada (2005)

Keynote Address, Reproductive Research Day, Stanford University, Stanford, CA (2006)

First Seven Days (Serono-sponsored meeting) Tampa, FL (2006)

International Symposium on Animal Functional Genomics, Michigan State University, East Lansing, MI (2006)

Frontiers in Reproduction, Woods Hole, MA (2006)

Annual meeting of the Society for the Study of Reproduction, Omaha, NB (2006)

Reproduction: Challenges and Advances, Keystone Meeting, Santa Fe, NM (2007)

Keynote Address: Texas Forum on Reproduction, Houston, TX (2007)

RNAi-2007-Boston Meeting, Boston, MA (2007)

Frontiers in Reproduction, Woods Hole, MA (2007)

Keynote Address: Fulka Symposium, Prague, Czech Republic (2007)

Annual meeting of the Canadian Fertility and Andrology Society, Halifax, Nova Scotia, Canada (2007)

Advances in Neonatology, Children's Hospital of Philadelphia, Philadelphia, PA (2007)

President's Symposium, SSR Annual Meeting, Hawaii (2008)

Frontiers in Reproduction, Woods Hole, MA (2008)

Frontiers in Reproduction, Woods Hole, MA (2009)

Keynote Lecture, American Society for Reproductive Medicine, Atlanta, GA (2009)

Frontiers in Reproduction, Woods Hole, MA (2010)

Annual meeting SSR, Minisymposium, Portland, OR (2011)

Preger Symposium, Temple University School of Medicine, Philadelphia, PA (2011)

Ralph Brinster Symposium, University of Pennsylvania, Philadelphia, PA (2013)

Symposium in Reproductive Science and Women's Health, U of KY, Lexington, KY (2014)

26th Annual William A. Sadler Lectureship in the Reproductive Sciences, Bethesda, MD (2014)
Keynote address, Molecular Biosciences retreat, University of Nevada, Reno (2015)
Mike McClure Lecture, Marine Biological Laboratory, Woods Hole, MA (2016)
Plenary Lecture, American Society for Reproductive Medicine, San Antonio, TX (2017)

Seminars

Division of Biomedical Sciences, Brown University, Providence, RI (1998)
Laboratory of Cellular and Developmental Biology, NIH, Bethesda, MD (1998)
Department of Biochemistry, Division of Reproductive Biology, Johns Hopkins University, Baltimore, MD (1998)
Fels Institute, Temple University, Philadelphia, PA (1999)
Infigen, DeForest, WI (1999)
Center for Transgenesis and Stem Cell Research, U of PA (2001)
Department of Cell Biology and Biochemistry, Texas Tech, Lubbock, TX (2001)
Dept. OB/GYN, Grand Rounds, U. of PA, Philadelphia, PA (2002)
Department of Biochemistry, Dental School, University of Pennsylvania (2002)
Department of Neuropsychiatry, University of Pennsylvania (2002)
Department of Biochemistry and Molecular Biology, MD Anderson, Houston, TX (2002)
Department of Biology, Delaware State University, Dover, DE (2002)
INRA, Paris, France (2002)
Department of Biochemistry and Molecular Biology, Johns Hopkins, Baltimore, MD (2002)
Department of OB/GYN, University of Utah, Salt Lake City, UT (2003)
Department of OB/GYN, Columbia University, School of Medicine, New York, NY (2003)
Center for Molecular Studies in Digestive and Liver Disease, U. of PA, Philadelphia, PA (2003)
Women's Health Research, Wyeth, Collegeville, PA (2003)
Department of Biochemistry, Jefferson University, Philadelphia, PA (2003)
Frontiers in Reproduction, Woods Hole, MA (2003)
Short Course on Mouse Genetics, The Jackson Laboratory, Bar Harbor, ME (2003)
Visiting Scholar Lecture Series, The Jackson Laboratory, Bar Harbor, ME (2003)
Department of Biology, Delaware State University, Dover, DE (2003)
CRRWH, U of PA, Philadelphia, PA (2003)
Department of Molecular and Cellular Biology, Roswell Park Cancer Institute, Buffalo, NY (2003)
Department of Cell, Molecular, and Developmental Biology, UC Davis, Davis, CA (2003)
Department of Biochemistry and Molecular Biology, Northwestern University, Evanston, IL (2004)
The Jackson Laboratory, Bar Harbor, ME (2004)
Howard University, Department of Biology, Washington, D.C. (2004)
Center for Transgenesis, New Bolton Center, University of Pennsylvania (2004)
Center for Research in Reproduction and Contraception, University of Washington, Seattle, WA (2005)
Oregon National Primate Research Center, Beaverton, OR (2005)
Howard University, Washington, D.C. (2005)
Pennington Biomedical Research Institute, Baton Rouge, LA (2005)

Center for Reproductive Sciences, Washington State University, Pullman, WA (2006)
Neonatology Unit, University of Pennsylvania, Philadelphia, PA (2006)
Center for Reproductive Sciences, UCSF, San Francisco, CA (2007)
Center of Excellence in Environmental Toxicology, U of PA, Philadelphia, PA (2007)
Center for Research on Reproduction and Women's Health, U of PA, Philadelphia, PA (2007)
Laboratory of Cellular and Developmental Biology, NIDDK, NIH, Bethesda, MD (2007)
Department of Physiology, Cornell University, Ithaca, NY (2008)
Department of Cell Biology, University of Virginia, Charlottesville, VA (2008)
Green Reproductive Biology Center, UT Southwestern, Dallas, TX (2008)
Center for Reproductive Sciences, Kansas University Medical Center, Kansas City, MO (2009)
Department of Biological Science, Lehigh University Lehigh, PA (2010)
Department of Cell Biology, University of Connecticut Health Sciences Center, Farmington, CT (2010)
Center for Excellence in Environmental Toxicology, U. of PA, Philadelphia, PA (2011)
Annual Retreat CRRWH, U. U. of PA, Philadelphia, PA (2011)
Department of Genetics, Rutgers University, New Brunswick, NJ (2012)
Department of Biochemistry, Michigan State University, East Lansing, MI (2012)
Population Council, New York City, NY (2013)
Department of Biochemistry and Molecular Biology, UC Davis, Davis, CA (2014)
Department of Animal Science, Utah State University, Logan, UT (2014)
Biomedical Sciences Seminar Series, UCSF, San Francisco, CA (2016)

SERVICE TO SCIENTIFIC COMMUNITY

Review manuscripts, e.g., *Developmental Biology*, *Development*, *PNAS*, *Nature*, and usually conduct *ad hoc* review for NIH once a year.

Member of the Developmental Biology Study Section at the National Science Foundation (1987-1990).
Vice-Chairman for Gordon Conference on Mammalian Gametogenesis and Embryogenesis (1990)
Chairman for Gordon Conference on Mammalian Gametogenesis and Embryogenesis (1992)
NIEHS Workshop on Gamete-Derived Determinants, Chairman (1992)
Member of Organizing Committee for Mid-Atlantic meeting of Society for Developmental Biology (1994)
Member, Program Committee for annual meeting of the Society for the Study of Reproduction (1994-1995)
Reproductive Biology Study Section, NIH (1993-1995 (agreed to 2-year term, and reappointed 1998-2001)
Member, Mouse Sperm Cryopreservation Advisory Committee, NIH (1998)
Chair, Program Committee for the Annual Meeting of the Society for the Study of Reproduction (1999)
Speaker, Workshop of Philadelphia High School Science Teachers (2002)
Chair, Oversight Committee for SSR's 5-year Strategic Plan (2009)
Chair, SSR Nominations Committee (2010)

EDITORIAL BOARDS

Associate Editor of Molecular Reproduction and Development (1987-2004)
Editorial Board, Developmental Biology (2000-2006)
Editorial Board, BioEssays (1993-2004)
Editorial Board, Biology of Reproduction (1995-2004, 2009-present)
Editorial Board, Developmental Biology (1999-2005)
Associate Editor, Biology of Reproduction (2004-2009)

GRADUATE STUDENTS AND POST-DOCTORAL FELLOWS

Graduate Students

Rolf Freter (1983-1985) received his Ph.D. and was an Assistant Professor of Medicine, Department of Oncology, Columbia University Medical School, and is now in private practice.

Elayne Bornslaeger (1983-1986) received her Ph.D. and was a Research Associate in the Department of Anatomy and Cell Biology, Northwestern University Medical School. I have lost contact with her.

Fazal Manejwala (1985-1989) received his Ph.D. and is currently a physician.

Alan Dardik (1989-1992) received his a Ph.D. and is currently an Associate Professor at Yale University.

Junying Yu (Ph.D., 2002) was a graduate student and is currently a Senior Scientist at the University of Wisconsin, Madison.

Petr Svoboda (Ph.D., 2002) was a graduate student and is a Professor, Institute of Molecular Genetics, Czech Republic.

Fanyi Zeng (Ph.D., 1999-2005), is a Professor, Shanghai Jiao Tong University School of Medicine, Shanghai, and Vice-President of the Shanghai Institute of Medical Genetics at SJTU and Vice-President of the Shanghai Stem Cell Institute.

Teresa Chiang (2007-2012) was a graduate student co-mentored by Mike Lampson and me and is currently teaching high school biology in a private school in Taiwan.

Olga Davydenko (2009-2014) was a graduate student co-mentored by Mike Lampson and me. She currently works for Leica.

Lukas Chmatal (2010-2015) is a post-doc with David Page at the Whitehead Institute/MIT.

Richard Jimenez (2010-2016) was a graduate student in the DVM/Ph.D. program and is in the process of identifying a private practice for future employment.

Erika Paulson (2016-pres) is a graduate student in the Animal Biology Graduate Group, UCD.

Post-Doctoral Fellows

Yoshihiro Endo (M.D., 1984-1986) is currently a Professor, Department of OB/GYN at Keio University, Japan.

Shigeaki Kurasawa (M.D., 1986-1989) is currently a Professor, Department of OB/GYN at Keio University, Japan.

Joanne Conover (Ph.D., 1988-1990) is an Associate Professor, Department of Physiology and Neurobiology, University of Connecticut, CT

JoLynda Jones (Ph.D., 1988-1990) a Senior Scientist at Bristol-Meyers Squibb.

Kenneth Pierce (Ph.D., 1988-1993) is Senior Research Scientist at Brandeis University.

Petr Kalab (Ph.D., 1990-1993) returned to the Czech Republic as a Staff Scientist (equivalent to Assistant Professor) at the Institute for Physiology and Genetics in the Czech Republic, before returning to the States at the University of California, Berkeley.

Takuya Ayabe (M.D., Ph.D., 1993-1995) is Professor in OB/GYN, Teikyo University.

Jiri Moos (Ph.D., 1993-present) returned to the Czech Republic as a Staff Scientist and is now employed by Sigma Corporation.

Paul De Sousa (Ph.D., 1993-1995) an Associate Researcher, MRC Centre for Regenerative Medicine, University of Edinburgh, Scotland and Reader, School of Clinical Sciences, University of Edinburgh; Chief Scientific Officer Roslin Cells Ltd.

Gretchen Temeles (Ph.D., 1990-1995) is an Associate, Duane Morris LLP.

Lanre Babalola (Ph.D., 1992-1996) is currently a physician.

Jayashree Mitra (Ph.D., 1993-1996) was an Assistant Professor at Drexel University. She is no longer on their faculty and I have lost contact with her.

Fugaku Aoki (Ph.D., 1995-1996) is currently a Professor at the University of Tokyo, Japan.

Daniel Brison (Ph.D., 1993-1997) is an Honorary Professor of Clinical Embryology and Stem Cell Biology; Scientific Director of the Department of Reproductive Medicine; and Co-Director NW Embryonic Stem Cell Centre (NWESCC) in Manchester, UK.

Grace Moore (M.D., 1992-1997) is currently on staff in the Department of Pathology at the University of Louisville, School of Medicine.

Janice Evans (Ph.D., 1992-1997) is a currently an Associate Professor at Johns Hopkins University.

Diane Worrada (Ph.D., 1992-present) Director, Graduate School of Biomedical Sciences, Rowan University, NJ

Paula Stein (Ph.D., 1996-present) is currently a Senior Research Associate and as the senior member of my laboratory is responsible for the daily oversight of the laboratory.

Harutoshi Hayashi (Ph.D., 1997-1999) was a post-doc and then a post-doctoral fellow at Fox Chase Cancer Institute. I have lost contact with him.

Mito Shinohara (Ph.D. 1997-2000) was graduate student and now works with her husband, who is a Professor at Osaka Oh at Kyoto University.

Carmen Williams (M.D., 1996-2000) is a Staff Scientist at NIEHS.

Warren Davis (Ph.D., 1998-1999) is an Assistant Professor of South Carolina Medical School.

Masashi Takahashi (Ph.D., 1998-1999) was a post-doc and is currently a Research Associate at the University of Tokyo.

Ma Jun (Ph.D., 1999-2000, 2005-present) was a graduate student and is currently a post-doctoral fellow in the lab.

Zhe Xu (Ph.D., 2000-2004) is on the faculty at Atlantic Cape Community College, NJ after taking time off to raise her children.

Yoko Kato (Ph.D., 2001-2002) is an Associate Professor, Kinki University, Japan, who did a sabbatical in my lab.

Paolo Rinaudo (M.D., Ph.D., 2002-2004) is currently an Associate Professor at UCSF.

Manqi Deng (Ph.D, 2001-2004) is currently a post-doctoral fellow at Brigham Young Hospital, Harvard Medical School, Boston, MA.

Martin Anger (Ph.D., 2001-2004) is a Group Leader (Assistant Professor equivalent), Department of Biology, Masaryk University, Brno, Czech Republic.

Shie Wang (Ph.D., 2002-2003) was a post-doctoral fellow in the lab who returned to his home institution in China to continue his studies.

Marcella Michaut (Ph.D., 2001-2005) is currently an Assistant Professor at the Instituto de Histología y embriología, Universidad Nacional de Cuyo, Mendoza, Argentina

Jason Knott (Ph.D., 2003-2005) is currently an Associate Professor at Michigan State University, East Lansing.

Hua Pan (Ph.D., 2003-2011) is currently a Research Associate at CHOP.

Rocio Rivera (Ph.D., 2004-2008) is an Associate Professor at the University of Missouri, Columbia, MO.

Sergey Medvedev (Ph.D., 2004-2013) was a Research Associate in the lab and is currently a Research Associate in the Department of OB/GYN at U of PA.

Karen Schindler (Ph.D., 2005-2012) is an Assistant Professor at Rutgers University.

Hedeki Igarashi (Ph.D., 2006-2007) is currently an Assistant Professor at Yamagata University, Yamagata, Japan.

PengPeng Ma (Ph.D., 2005-2015) is currently employed by a private company.

Motomasa Ihara (Ph.D., 2006-2010) is currently an Assistant Professor of OBGYN at Sendai University, Japan..

Francesca Duncan (Ph.D., 2006-2009) is currently a Research Assistant Professor at Northwestern University.

Shin Murai (Ph.D., 2009-2010) is presently an Assistant Professor at Toho University School of Medicine, Japan.

Monica Maingini (M.D., 2009-2011) is currently an Assistant Professor of OBGN/ at U of PA.

Mariano Buffone (Ph.D, 2009) is currently an Assistant Professor at the Instituto de Biología y Medicina Experimental in Buenos Aires, Argentina.

Kimberly Fuller (Ph.D., 2011-212) is currently a medical writer.

Ahmed Bolboula (Ph.D., 2011-212) is a Madame Curie Fellow working with David Glover, Wellcome Investigator, Department of Genetics, University of Cambridge, UK and will be an Assistant Professor, Department of Animal Science, University of Missouri, effective May 1, 2019.

Yusuke Fukuda (M.D., 2012-2014) is currently an Assistant Professor, Department of OBGYN, Toho University School of Medicine, Japan

Hui-li Wang (Ph.D., 2014-2015) is an Associate Professor at the Institute for Animal Science, Jiangsu Academy of Agricultural Sciences, China and conducted a sabbatical leave in my lab.

PUBLICATIONS

1. Groman, E.V., Schultz, R.M., and Engel, L.L. (1975). Catalytic competence, a new criterion for affinity labeling: Demonstration of the reversible enzymatic interconversion of estrone and estradiol-17 β covalently bound to human placental estradiol-17 β dehydrogenase. *J. Biol. Chem.* 250, 5450-5454.
2. Groman, E.V., Schultz, R.M., Engel, L.L., and Orr, J.C. (1976). Horse liver alcohol dehydrogenase and *Pseudomonas testosteroni* 3(17) β -hydroxysteroid dehydrogenase transfer epimeric hydrogens from NADH and 17 β -hydroxy-5 α -androstane-3-one: An exception to one of the Alworth-Bentley rules. *Eur. J. Biochem.* 63, 427-429.
3. Schultz, R.M., Groman, E.V., and Engel, L.L. (1977). 3(17) β -Hydroxysteroid dehydrogenase of *Pseudomonas testosteroni* : A convenient purification and demonstration of multiple molecular forms. *J. Biol. Chem.* 252, 3775-3783.

4. Schultz, R.M., Groman, E.V., and Engel, L.L. (1977). 3(17) β -Hydroxysteroid dehydrogenase of *Pseudomonas testosteroni* : Ligand binding properties. *J. Biol. Chem.* 252, 3784-3790.
5. Groman, E.V., Schultz, R.M., and Engel, L.L. (1977). Catalytic competence: A direct criterion for affinity labeling. *Meth. in Enzymol.* 46, 54-58.
6. Schultz, R.M., and Wassarman, P.M. (1977). [^3H]-Dansyl chloride: A useful reagent for the quantitation and molecular weight determination of nanogram amounts of protein. *Anal. Biochem.* 77, 25-32.
7. Schultz, R.M., and Wassarman, P.M. (1977). Biochemical studies of mammalian oogenesis: Protein synthesis during oocyte growth and meiotic maturation in the mouse. *J. Cell Sci.* 24, 167-194.
8. Schultz, R.M., and Wassarman, P.M. (1977). Specific changes in the pattern of protein synthesis during meiotic maturation of the mammalian oocyte in vitro. *Proc. Nat. Acad. U.S.A.* 74, 538-541.
9. Krouwer, J.S., Schultz, R.M., and Babior, B.M. (1978). The mechanism of action of ethanolamine ammonia-lyase, an adenosylcobalamin-dependent enzyme: Reaction of the enzyme-cofactor complex with 2-amino-acetaldehyde. *J. Biol. Chem.* 253, 1041-1047.
10. Schultz, R.M., Letourneau, G.E., and Wassarman, P.M. (1978). Meiotic maturation of mouse oocytes in vitro : Protein synthesis in nucleate and anucleate oocyte fragments. *J. Cell Sci.* 30, 251-264.
11. Schultz, R.M., LaMarca, M.J., and Wassarman, P.M. (1978). The absolute rates of total protein synthesis during meiotic maturation of the mouse oocyte in vitro. *Proc. Nat. Acad. Sci. U.S.A.* 75, 4160-4164.
12. Schultz, R.M., Bleil, J.D., and Wassarman, P.M. (1978). Quantitation of nanogram amounts of protein using [^3H]dinitrofluorobenzene. *Anal. Biochem.* 91, 353-356.
13. Wassarman, P.M., Schultz, R.M., Letourneau, G.E., LaMarca, M.J., Josefowicz, W.J., and Bleil, J.D. (1978). Meiotic maturation of mouse oocytes in vitro. In "Ovarian, Follicular and Corpus Luteum Function", Channing, C.P., Marsh, J., and Sadler, W.A., eds., pp. 251-268. Invited article; not reviewed.
14. Schultz, R.M., Letourneau, G.E., and Wassarman, P.M. (1979). Program of early development in the mammal: Changes in the patterns and absolute rates of synthesis of tubulin and total protein during oogenesis and early embryogenesis in the mouse. *Dev. Biol.* 68, 341-369.
15. Wassarman, P.M., Schultz, R.M., and Letourneau, G.E. (1979). Meiotic maturation of mouse oocytes in vitro : Synthesis and phosphorylation of a protein associated with the germinal vesicle. *Dev. Biol.* 69, 94-107.
16. Lefebvre, Y.A., Lefebvre, D.D., Schultz, R.M., Groman, E.V., and Watanabe, M. (1979). The effects of inhibitors and an antiserum to 3(17) β -hydroxy-steroid

- dehydrogenase on steroid uptake in *Pseudomonas testosteroni*. *J. Steroid. Biochem.* 10, 519-522.
17. Lefebvre, Y.A., Schultz, R.M., Groman, E.V., and Watanabe, M. (1979). Localization of 3(17) β -hydroxysteroid dehydrogenase in *Pseudomonas testosteroni*. *J. Steroid Biochem.* 10, 523-529.
18. Schultz, R.M., Letourneau, G.E., and Wassarman, P.M. (1979). Program of early development in the mammal: Changes in the patterns and absolute rates of tubulin and total protein synthesis during oocyte growth in the mouse. *Dev. Biol.* 73, 120-133.
19. Schultz, R.M., and Wassarman, P.M. (1980). Efficient extraction and quantitative determination of nanogram amounts of cellular RNA. *Anal. Biochem.* 104, 328-334.
20. Heller, D.T., and Schultz, R.M. (1980). Ribonucleoside metabolism by mouse oocytes: Metabolic cooperativity between the fully-grown oocyte and cumulus cells. *J. Exp. Zool.* 214, 355-364.
21. Wassarman, P.M., Bleil, J.D., Cascio, S.M., LaMarca, M.J., Letourneau, G.E., Mrozak, S.C., and Schultz, R.M. (1981). Programmed gene expression during mammalian oogenesis. In *Regulators of Reproduction*, Jagiello, G., and Vogel, H.J., eds., pp. 119-150, Columbia P and S Biomedical Sciences Symposia, Academic Press, New York. Invited article; not reviewed.
22. Sternlicht, A.L., and Schultz, R.M. (1981). Biochemical studies of mammalian oogenesis: Kinetics of accumulation of total and poly(A)-containing RNA during growth of the mouse oocyte. *J. Exp. Zool.* 215, 191-200.
23. Heller, D.T., Cahill, D.M., and Schultz, R.M. (1981). Biochemical studies of mammalian oogenesis: Metabolic cooperativity between granulosa cells and growing mouse oocytes. *Dev. Biol.* 84, 455-464.
24. Brower, P.T., Gizang, E., Boreen, S.M., and Schultz, R.M. (1981). Biochemical studies of mammalian oogenesis: Synthesis and stability of various classes of RNA during growth of the mouse oocyte in vitro. *Dev. Biol.* 86, 373-383.
25. Brower, P.T., and Schultz, R.M. (1982). Intercellular communication between granulosa cells and mouse oocytes: Existence and possible nutritional role during oocyte growth. *Dev. Biol.* 90, 144-153.
26. Brower, P.T., and Schultz, R.M. (1982). Biochemical studies of mammalian oogenesis: Possible existence of a ribosomal and poly(A)-containing RNA-protein supramolecular complex in mouse oocytes. *J. Exp. Zool.* 220, 251-260.
27. Eppig, J.J., Ward, P.F., Pottera, J.E.R., and Schultz, R.M. (1982). Selective action of sulfated glycosaminoglycans on FSH-stimulated functions of cumuli oophori isolated from mice. *Biol. Reprod.* 27, 399-406.
28. Eppig, J.J., Ward, P.F., Pottera, J.E.R., and Schultz, R.M. (1983). Site of action for suppression of follicle-stimulating hormone-induced cumulus expansion by sulfated

- glycosaminoglycans. In "Ovarian Workshop", Greenwald, G.S., and Terranova, P.F., eds., pp. 71-74, Raven Press, New York. Invited article; not reviewed.
29. Schultz, R.M., Montgomery, R.R., Ward-Bailey, P.F., and Eppig, J.J. (1983). Regulation of oocyte maturation in the mouse: Possible roles of intercellular communication, cAMP, and testosterone. *Dev. Biol.* 95, 294-304.
30. Iyengar, M.R., Iyengar, Y.W.L., Chen, H.Y., Brinster, R.L., Bornslaeger, E.A., and Schultz, R.M. (1983). Expression of creatine kinase isoenzyme during oogenesis and early embryogenesis in the mouse. *Dev. Biol.* 96, 263-268.
31. Schultz, R.M., Montgomery, R.R., and Belanoff, J.R. (1983). Regulation of mouse oocyte maturation: Implication of a decrease in oocyte cAMP and protein dephosphorylation in commitment to resume meiosis. *Dev. Biol.* 97, 264-273.
32. Eppig, J.J., Freter, R.R., Ward-Bailey, P.F., and Schultz, R.M. (1983). Relationships between a maturation inhibitory factor, cAMP, and steroid in regulation of mouse oocyte maturation. *Dev. Biol.* 100, 39-49.
33. Boreen, S.M., Gizang, E., and Schultz, R.M. (1983). Biochemical studies of mammalian oogenesis: Synthesis of 5S and 4S RNA during growth of the mouse oocyte. *Gamete Res.* 8, 379-383.
34. Herlands, R.L., and Schultz, R.M. (1984). Regulation of mouse oocyte growth: Probable nutritional role for intercellular communication between follicle cells and oocytes in oocyte growth. *J. Exp. Zool.* 229, 317-325.
35. Freter, R.R., and Schultz, R.M. (1984). Regulation of murine oocyte maturation: Evidence for a gonadotropin-induced, cAMP-dependent reduction in a maturation inhibitor. *J. Cell Biol.* 98, 1119-1128.
36. Bornslaeger, E.A., Wilde, M.W., and Schultz, R.M. (1984). Regulation of mouse oocyte maturation: Involvement of cAMP phosphodiesterase and calmodulin. *Dev. Biol.* 105, 488-499.
37. Schultz, R.M. (1985). Roles of cell-to-cell communication in development. *Biol. Reprod.* 32, 27-42. Invited article; not reviewed.
38. Eppig, J.J., Ward-Bailey, P.F., and Schultz, R.M. (1985). The physiological functions of ovarian glycosaminoglycans. In "Ovarian Workshop", Raven Press, New York, In Press. Invited article; not reviewed.
39. Bornslaeger, E.A., and Schultz, R.M. (1985) Zona-free mouse oocytes contain adenylate cyclase. *Exp. Cell Res.* 156, 277-281.
40. Bornslaeger, E.A., and Schultz, R.M. (1985). Regulation of mouse oocyte maturation. Effect of elevating cumulus cell cAMP on oocyte cAMP levels. *Biol. Reprod.* 33, 698-704.

41. Bornslaeger, E.A., Mattei, P.M., and Schultz, R.M. (1986). Involvement of cAMP-dependent protein kinase and protein phosphorylation in regulation of mouse oocyte maturation. *Dev. Biol.* 114, 453-462.
42. Bornslaeger, E.A., Poueymirou, W.T., Mattei, P.M., and Schultz, R.M. (1986). Effects of protein kinase C activators on germinal vesicle breakdown and polar body emission of mouse oocytes. *Exp. Cell Res.* 165, 507-517.
43. Manejwala, F., Kaji, E., and Schultz, R.M. (1986). Development of activatable adenylate cyclase in the preimplantation mouse embryo and a role for cAMP in blastocoel formation. *Cell* 46, 95-103.
44. Endo, Y., Kopf, G.S., and Schultz, R.M. (1986). Stage-specific changes in protein phosphorylation accompanying meiotic maturation of mouse oocytes and fertilization of mouse eggs. *J. Exp. Zool.* 239, 401-409.
45. Bornslaeger, E.A., Freter, R.R., and Schultz, R.M. (1986). Regulation of mouse oocyte maturation: Involvement of cAMP, cAMP phosphodiesterase, and calmodulin. In "Development and Function of the Reproductive Organs", Tsafiri, A., ed., pp. 125-138. Raven Press, New York, In Press. Invited article; not reviewed.
46. Schultz, R.M. (1986). Oogenesis and the control of meiotic maturation. In "Experimental Approaches to Mammalian Embryonic Development", eds., Pedersen, R., and Rossant, J., pp. 195-237. Cambridge University Press, New York. Invited article; not reviewed.
47. Endo, Y., Schultz, R.M., and Kopf, G.S. (1987). Effects of phorbol esters and a diacylglycerol on mouse eggs: Inhibition of fertilization and modification of the zona pellucida. *Dev. Biol.* 119, 199-209.
48. Poueymirou, W.T., and Schultz, R.M. (1987). Differential effects of activators of cAMP-dependent protein kinase and protein kinase C on cleavage of one-cell mouse embryos and protein synthesis and phosphorylation in one- and two-cell embryos. *Dev. Biol.* 121, 489-498.
49. Endo, Y., Mattei, P., Kopf, G.S., and Schultz, R.M. (1987). Effects of phorbol esters on mouse eggs: Dissociation of sperm receptor activity from acrosome-inducing activity of the mouse zona pellucida protein, ZP3. *Dev. Biol.* 123, 574-577.
50. Kaji, E., Bornslaeger, E.A., and Schultz, R.M. (1987). Inhibition of mouse oocyte cyclic nucleotide phosphodiesterase by steroid hormones: A possible mechanism for steroid hormone inhibition of oocyte maturation. *J. Exp. Zool.* 243, 489-493.
51. Schultz, R.M. (1988). Regulatory functions of protein phosphorylation in meiotic maturation of mouse oocyte in vitro. In "Meiotic Inhibition: Molecular Control of Meiosis", *Prog. Clin. Biol. Res.*, vol. 267, pp. 137-151. Haseltine, F.P. and First, N.L., eds. Alan Liss, Inc., New York. Invited article, not reviewed.
52. Schultz, R.M. (1988). Control mechanisms regulating meiotic maturation of mammalian oocytes. In "In vitro Fertilization and Embryo Transfer: A Manual of Basic

Techniques", Wolf, D.P. ed., pp. 449-358. Plenum Press, New York. In Press. Invited article, not reviewed.

53. Schultz, R.M., Endo, Y., Mattei, P., Kurasawa, S., and Kopf, G.S. (1988). Egg-induced modifications in the mouse egg's zona pellucida. In "Cellular Factors in Development and Differentiation—Embryos, Teratocarcinomas, and Differentiated Tissue", Harris, S.E., and Mansson, P.-E. eds., Prog. Clin. Biol. Res., vol. 284, pp. 77-92, Alan Liss, Inc. NY. Invited article, not reviewed.

54. Schultz, R.M. (1988). Role of protein phosphorylation in meiotic maturation of mouse oocytes in vitro. In "In Vitro and Other Assisted Reproduction", Ann. N.Y. Acad. Sci. 541, 217-227. Invited article, not reviewed.

55. Rappolee, D.A., Brenner, C.A., Schultz, R., Mark, D., and Werb, Z. (1988). Developmental expression of PDGF, TGF- α and TGF- β genes in preimplantation embryos. Science 241, 1823-1825.

56. Bornslaeger, E.A., Mattei, P.M., and Schultz, R.M. (1988). Protein phosphorylation in meiotically competent and incompetent mouse oocytes. Mol. Reprod. Dev. 1, 19-25.

57. Jones, J., Kopf, G.S., and Schultz, R.M. (1989). Variability in the electrophoretic mobility of G β -like proteins: Effect of sodium dodecyl sulfate. FEBS Lett. 243, 409-412.

58. Manejwala, F., Cragoe, E., Jr., and Schultz, R.M. (1989). Blastocoel formation in the preimplantation mouse embryo: Role of extracellular sodium and chloride and possible apical routes of their entry. Dev. Biol. 133, 210-220.

59. Kurasawa, S., Schultz, R.M., and Kopf, G.S. (1989). Egg-induced modifications of the zona pellucida of the mouse egg: Effects of microinjected inositol 1,4,5-trisphosphate. Dev. Biol. 133, 295-304.

60. Poueymirou, W.T., and Schultz, R.M. (1989). Regulation of the mouse preimplantation development: Inhibition of synthesis of proteins in the two-cell embryo that require transcription by inhibitors of cAMP-dependent protein kinase. Dev. Biol. 133, 588-599.

61. Poueymirou, W.T., Conover, J.C., and Schultz, R.M. (1989). Regulation of mouse preimplantation development: Differential effects of CZB and Whitten's media on rates and patterns of protein synthesis in 2-cell embryos. Biol. Reprod. 41, 317-322.

62. Manejwala, F.M., and Schultz, R.M. (1989). Blastocoel formation in the mouse preimplantation mouse embryo: Stimulation of sodium uptake by cAMP and role of cAMP-dependent protein kinase. Dev. Biol. 136, 560-563.

63. Kopf, G.S., Endo, Y., Mattei, P., Kurasawa, S., and Schultz, R.M. (1989). Egg-induced modifications of the murine zona pellucida. In "Mechanisms of Egg Activation", Nuccitelli, R., Cherr, N., and Clark, W.H., Jr., eds., pp. 249-272, Plenum Press, New York. Invited article, not reviewed.

64. Schultz, R.M., Kurasawa, S., Endo, Y., and Kopf, G.S. (1989). Molecular events pre- and post-fertilization of mouse eggs: Oocyte maturation, egg activation, and polyspermy block. In "Medically Assisted Conception: An Agenda for Research", Ryan, K.J., ed., pp. 262-281. National Academy Press, Washington. Invited article, not reviewed.
65. Schultz, R.M., Kurasawa, S., Endo, Y., and Kopf, G.S. (1989). Role of second messenger molecules in egg-induced modifications of the mouse egg's zona pellucida. In "Follicular Development and the Ovulatory Response", Tsafirri, A., and Dekel, N., eds., pp. 263-272, Ares-Serono Symposia, Rome, Italy. Invited article, not reviewed.
66. Ducibella, T., Kurasawa, S., Rangarajan, S., Kopf, G.S., and Schultz, R.M. (1990). Changes in distribution of mouse egg cortical granules during meiotic maturation and correlation with an egg-induced modification of the zona pellucida. *Dev. Biol.* 137, 46-55.
67. Ducibella, T., Kopf, G.S., and Schultz, R.M. (1990). Use of serum and timing of insemination for IVF. *J. IVF and Embryo Transfer.* 7, 121-123.
68. Jones, J., and Schultz, R.M. (1990). Pertussis toxin-catalyzed ADP-ribosylation of a G protein in mouse oocytes, eggs, and preimplantation embryos: Developmental changes and possible functional roles. *Dev. Biol.* 139, 250-262.
69. Poueymirou, W.T., and Schultz, R.M. (1990). Regulation of mouse preimplantation development: Inhibitory effect of the calmodulin antagonist W7 on the first cleavage. *Mol. Reprod. Dev.* 26, 211-216.
70. Besterman, B., and Schultz, R.M. (1990). Regulation of mouse preimplantation development: Inhibitory effect of genistein, an inhibitor of tyrosine protein phosphorylation, on cleavage of one-cell embryos. *J. Exp. Zool.* 256, 44-53.
71. Pierce, K.E., Siebert, M.C., Kopf, G.S., Schultz, R.M., and Calarco, P.G. (1990). Characterization and localization of a mouse egg cortical granule antigen prior to and following fertilization or egg activation. *Dev. Biol.* 141, 381-392.
72. Schroeder, A.C., Schultz, R.M., Kopf, G.S., Taylor, F.R., Becker, R., and Eppig, J.J. (1990). Fetuin inhibits zona pellucida hardening and conversion of ZP2 to ZP2f during spontaneous mouse oocyte maturation in vitro in the absence of serum. *Biol. Reprod.* 43, 891-897.
73. Schultz, R.M. Meiotic maturation of mammalian oocytes. (1990). In "The Biology and Chemistry of Fertilization", Wassarman, P.M., ed., Vol. I, pp. 77-104. CRC Press, Florida. Invited article, not reviewed.
74. Kopf, G.S., Endo, Y., Kurasawa, S., and Schultz, R.M. (1990). Molecular mechanisms of mammalian sperm-zona pellucida interaction: Crosstalk between sperm and egg. In "Advances in Assisted Reproduction Technologies", Mashich, S., Ben-Raphael, Z., Laufer, N. and Schenker, J.G., eds., pp. 415-436, Plenum Press, New York. Invited article.

75. Manejwala, F., Logan, C.Y., and Schultz, R.M. (1991). Regulation of hsp70 mRNA levels during oocyte maturation and zygotic gene activation in the mouse. *Dev. Biol.* 144, 301-308.
76. Conover, J.C., Temeles, G.L., Zimmermann, J.W., Burke, B., and Schultz, R.M. (1991). Stage-specific expression of a family of proteins that are major products of zygotic gene activation in the mouse embryo. *Dev. Biol.* 144, 392-404.
77. Schwartz, D.A., and Schultz, R.M. (1991). Stimulatory effect of okadaic acid, an inhibitor of protein phosphatases, on nuclear envelope breakdown and protein phosphorylation in mouse oocytes and 1-cell embryos. *Dev. Biol.* 145, 119-127.
78. Jones, J., Logan, C.Y., and Schultz, R.M. (1991). Changes in temporal and spatial patterns of G_i protein expression in postimplantation mouse embryos. *Dev. Biol.* 145, 128-138.
79. Dardik, A., and Schultz, R.M. (1991). Protein secretion by the mouse blastocyst: Differences in the polypeptide composition in the blastocoel and medium. *Biol. Reprod.* 45, 328-333.
80. Kalab, P., Kopf, G.S., and Schultz, R.M. (1991). Modifications of the mouse zona pellucida during oocyte maturation and egg activation: Effects of newborn calf serum and fetuin. *Biol. Reprod.* 45, 783-787.
81. Latham, K., Solter, D., and Schultz, R.M. (1991). Activation of a two-cell stage-specific gene following transfer of heterologous nuclei into enucleated mouse embryos. *Mol. Reprod. Dev.* 30, 182-186.
82. Dardik, A., and Schultz, R.M. (1991). Blastocoel expansion in the mouse preimplantation mouse embryo: Stimulatory effect by TGF- α and EGF. *Development* 113, 919-930.
83. Latham, K., Solter, D., and Schultz, R.M. (1992). Acquisition of a transcriptionally permissive state during the one-cell stage of mouse embryogenesis. *Dev. Biol.* 149, 457-462.
84. Williams, C., Schultz, R.M., and Kopf, G.S. (1992). Role of G proteins in mouse egg activation: Stimulatory effects of acetylcholine on the ZP2 to ZP2_f conversion and pronuclear formation in eggs expressing a functional m1 muscarinic receptor. *Dev. Biol.* 151, 288-296.
85. Schwartz, D.A., and Schultz, R.M. (1992). Zygotic gene activation in the mouse embryo: Involvement of cAMP-dependent protein kinase and appearance of an AP-1-like activity. *Mol. Reprod. Dev.* 32, 209-216.
86. Pierce, K.E., Grunvald, E., Schultz, R.M., and Kopf, G.S. (1992). Temporal pattern of synthesis of the mouse cortical granule protein, p75, during oocyte growth and maturation. *Dev. Biol.* 152, 145-151.
87. Dardik, A., and Schultz, R.M. (1992). Changes in cAMP phosphodiesterase activity and cAMP concentration during mouse preimplantation development. *Mol.*

Reprod. Dev. 32 349-353.

88. Dardik, A., Smith, R.M., and Schultz, R.M. (1992). Co-localization of transforming growth factor- α and a functional epidermal growth factor receptor (EGFR) to the inner cell mass and preferential localization of the EGFR on the basolateral surface of the trophectoderm in the mouse blastocyst. *Dev. Biol.* 154, 396-409.

89. Dardik, A., Doherty, A.S., and Schultz, R.M. (1993). Protein secretion by the mouse blastocyst: Stimulatory effect on secretion into the blastocoel by transforming growth factor- α . *Mol. Reprod. Dev.* 34, 396-401.

90. Ram, P.T., and Schultz, R.M. (1993). Reporter gene expression in G2 of the one-cell mouse embryo. *Dev. Biol.* 156, 552-556.

91. Anbari, K., and Schultz, R.M. (1993). Effect of sodium and betaine in culture media on development and protein synthesis in preimplantation mouse embryos in vitro. *Mol. Reprod. Dev.* 35, 24-28.

92. Ducibella, T., Kurasawa, S., Duffy, P., Kopf, G.S., and Schultz, R.M. (1993). Regulation of the polyspermy block in the mouse egg: Maturation-dependent differences in cortical granule exocytosis and zona pellucida modifications induced by inositol 1,4,5-trisphosphate and an activator of protein kinase C. *Biol. Reprod.* 48, 1251-1257.

93. Kalab, P., Schultz, R.M., and Kopf, G.S. (1993). Modifications of the mouse zona pellucida during oocyte maturation: Inhibitory effects of follicular fluid, fetuin, and α_2 HS-glycoprotein. *Biol. Reprod.* 49, 561-567.

94. Schultz, R.M. (1993). Regulation of zygotic gene activation in the mouse. *BioEssays*. 8, 531-538.

95. Moore, G.D., Kopf, G.S., and Schultz, R.M. (1993). Complete mouse egg activation in the absence of sperm by stimulation of an exogenous G protein-coupled receptor. *Dev. Biol.* 159, 669-678.

96. Schultz, R.M. (1993). Regulation of zygotic gene activation in the mouse. In "Meiosis II: Contemporary Approaches to the Study of Meiosis", Haseltine, F.P., and Heyner, S., eds. pp. 175-185. AAAS Press, Washington, DC. Invited article, not reviewed. In Press.

97. Doherty, A.S., Temeles, G.L., and Schultz, R.M. Temporal pattern of IGF-I expression during mouse preimplantation embryogenesis. (1994). *Mol. Reprod. Dev.* 37, 21-26.

98. Temeles, G.L., Ram, P.T., Rothstein, J.L., and Schultz, R.M. (1994). Expression patterns of novel genes during mouse preimplantation embryogenesis. *Mol. Reprod. Dev.* 37, 121-129.

99. Latham, K.E., Scott, C.D., Doherty, A.S., and Schultz, R.M. (1994). Igf2r and Igf2 gene expression in androgenetic, gynogenetic, and parthenogenetic preimplantation mouse embryos: Absence of regulation by genomic imprinting. *Genes and*

Development 8, 290-299.

100. Moos, J., Kalab, P., Kopf, G.S., and Schultz, R.M. (1994). A rapid, non-radioactive, and quantitative method to analyze zona pellucida modifications in single mouse eggs. *Mol. Reprod. Dev.* 38, 91-93.

101. Ho, Y., Doherty, A.S., and Schultz, R.M. (1994). Mouse preimplantation embryo development in vitro: Effect of sodium in culture media on RNA synthesis and accumulation, and gene expression. *Mol. Reprod. Dev.* 38, 131-141.

102. Zimmermann, J.W., and Schultz, R.M. (1994). Analysis of gene expression in the preimplantation mouse embryo: Use of mRNA differential display. *Proc. Natl. Acad. Sci. USA* 91, 5456-5460.

103. Eppig, J.J., Schultz, R.M., O'Brien, M., and Chesnel, F. (1994). Relationship between the developmental programs controlling nuclear and cytoplasmic maturation of mouse oocytes. *Dev. Biol.* 164, 1-9.

104. Xu, Z., Kopf, G.S., and Schultz, R.M. (1994). Involvement of inositol 1,4,5-trisphosphate-mediated Ca^{2+} release in early and late events of mouse egg activation. *Development* 120, 1851-1859.

105. Worrad, D.M., Ram, P.T., and Schultz, R.M. (1994). Regulation of gene expression in the mouse oocyte and early preimplantation embryo: Developmental changes in Sp1 and TATA box-binding protein, TBP. *Development* 120, 2347-2357.

106. Moore, G.M., Ayabe, T., Visconti, P.E., Schultz, R.M., and Kopf, G.S. (1994). Sperm-induced activation of mouse eggs: Role of heterotrimeric and monomeric G proteins. *Development* 120, 3313-3323.

107. Evans, J.P., Schultz, R.M., and Kopf, G.S. (1995). Identification and localization of integrin subunits in oocytes and eggs of the mouse. *Mol. Reprod. Dev.* 40, 211-220.

108. Babalola, G.O., and Schultz, R.M. (1995). Effect of TGF- α and TGF- β on gene expression in the preimplantation mouse embryo. *Mol. Reprod. Dev.* 41, 133-139.

109. Ho, Y., Wigglesworth, K., Eppig, J.J., and Schultz, R.M. (1995). Preimplantation development of mouse embryos in KSOM: Augmentation by amino acids and analysis of gene expression. *Mol. Reprod. Dev.* 41, 232-238.

110. Ayabe, T., Kopf, G.S., and Schultz, R.M. (1995). Regulation of mouse egg activation: Presence of ryanodine receptors and effects of microinjected ryanodine and cyclic ADP ribose on uninseminated and inseminated eggs. *Development* 121, 2233-2244.

111. Moos, J., Visconti, P.W., Moore, G.D., Schultz, R.M., and Kopf, G.S. (1995). Potential role of mitogen-activated protein kinase (MAP) kinase in pronuclear envelope assembly and disassembly following fertilization of mouse eggs. *Biol. Reprod.* 53, 692-699.

112. Moore, G.D., Kopf, G.S., and Schultz, R.M. (1995). Differential effect of activators of protein kinase C on cytoskeletal changes in hamster and mouse eggs. *Dev. Biol.* 170, 519-530.
113. Worrad, D.M., Turner, B.M., and Schultz, R.M. (1995). Temporally restricted spatial localization of acetylated isoforms of histone H4 and RNA polymerase II in the 2-cell mouse embryo. *Development* 121, 2949-2959.
114. Evans, J.P., Schultz, R.M., and Kopf, G.S. (1995). Fertilization of mouse eggs: Implication of egg integrins and the mouse sperm homologue of PH-30 (fertilin) b sperm-egg plasma membrane interactions. *J. Cell Sci.* 108, 3267-3278.
115. Moos, J., Faundes, D., Kopf, G.S., and Schultz, R.M. (1995). Composition of the human zona pellucida and modifications following fertilization. *Human Reprod.* 11, 2467-2471.
116. Schultz, R.M., Worrad, D.M., Davis, Warren, Jr., and De Sousa, P. (1995). Regulation of gene expression in the preimplantation mouse embryo. *Theriogenology* 44, 1115-1131.
117. Schultz, R.M., and Worrad, D.M. (1995). Role of chromatin structure in zygotic gene activation in the mammalian embryo. *Seminars in Cell Biology* 6, 201-208. Invited article, not reviewed.
118. Schultz, R.M., and Kopf, G.S. (1995). Molecular basis of mammalian egg activation. In "Current Topics in Developmental Biology", Pedersen, R.A., and Schatten, G., eds., pp. 21-62, Academic Press, Inc., San Diego. Invited article, not reviewed.
119. Davis, W., Jr., De Sousa, P.D., and Schultz, R.M. (1996). Transient expression of translation initiation factor eIF-4C during the 2-cell stage of the preimplantation mouse embryo: Identification by mRNA differential display and the role of DNA replication. *Dev. Biol.* 174, 190-201.
120. Moos, J., Kopf, G.S., and Schultz, R.M. (1996). Cycloheximide-induced activation of mouse eggs: Effects on cdc2/cyclin B and MAP kinase activities. *J. Cell Sci.* 109, 739-748.
121. Moos, J.M., Xu, Z., Schultz, R.M., and Kopf, G.S. (1996). Regulation of nuclear envelope assembly/disassembly by MAP kinase. *Dev. Biol.* 175, 358-361.
122. Brison, D.A., and Schultz, R.M. (1996). An RT-PCR-based method to localize the spatial expression of genes in the mouse blastocyst. *Mol. Reprod. Dev.* 44, 171-178.
123. Eppig, J.J., Schultz, R.M., and Kopf, G.S. (1996). Maturation of mouse oocytes in serum-free medium. *Hum. Reprod.* 11, 1139-1140.
124. Williams, C.J., Schultz, R.M., and Kopf, G.S. (1996). G protein gene expression during mouse oocyte growth and maturation, and preimplantation embryo development. *Mol. Reprod. Dev.* 44, 315-323.

125. Mitra, J., and Schultz, R.M. (1996). Regulation of the acquisition of meiotic competence in the mouse: Changes in the subcellular localization of cdc2, cyclin B1, cdc25C, and wee1 proteins, and the concentration of these proteins and their transcripts. *J. Cell Sci.* 109, 2407-2415.
126. Moore, G.D., Ayabe, T., Kopf, G.S., and Schultz, R.M. (1996). Temporal patterns of gene expression of G1-S cyclins and cdks during the first and second mitotic cell cycles in mouse embryos. *Mol. Reprod. Dev.* 45, 264-275.
127. Xu, Z., LeFevre, L., Ducibella, T., Schultz, R.M., and Kopf, G.S. (1996). Effects of calcium-BAPTA buffers and the calmodulin antagonist W-7 on mouse egg activation. *Dev. Biol.* 180, 594-604.
128. Motlik, J., Sutovsky, P., Kalous, J., Kubelka, M., Moos, J., and Schultz, R.M. (1996). Co-culture with pig membrana granulosa cells modulates the activity of cdc2 and MAP kinase in maturing cattle oocytes *Zygote* 4, 247-256.
129. Zimmermann, J.W., and Schultz, R.M. (1996). Analysis of gene expression in the preimplantation mouse embryo using mRNA differential display. *Springer Lab Manual*, Micheli, M.R., and Bova, R., eds. pp. 405-414, Springer-Verlag Press, Heidelberg.
130. Aoki, F., Worrada, D.M., and Schultz, R.M. (1997). Regulation of endogenous transcriptional activity during the first and second cell cycles in the preimplantation mouse embryo. *Dev. Biol.* 181, 296-307.
131. Worrada, D.M., and Schultz, R.M. (1997). Regulation of gene expression in the preimplantation mouse embryo: Temporal and spatial patterns of expression of the transcription factor Sp1. *Mol. Reprod. Dev.* 46, 268-277
132. Brison, D.R., and Schultz, R.M. (1997). Apoptosis during preimplantation mouse embryo formation: Evidence for a role for survival factors including TGF- α . *Reprod.* 56, 1088-109.
133. Temeles, G.L., and Schultz, R.M. (1997). Transient polyadenylation of a maternal mRNA following fertilization of mouse eggs. *J. Reprod. Fertil.* 109, 223-228.
134. Stein, P., Worrada, D.M., Belyaev, K., Turner, B.M., and Schultz, R.M. (1997). Stage-dependent redistributions of acetylated core histones in nuclei in the early preimplantation mouse embryo. *Mol. Reprod. Dev.* 47, 421-429.
135. Davis, W., Jr., and Schultz, R.M. (1997). Role of the first round of DNA replication in reprogramming gene expression in the preimplantation mouse embryo. *Mol. Reprod. Dev.* 47, 430-434.
136. Evans, J.P., Kopf, G.S., and Schultz, R.M. (1997). Characterization of the binding of recombinant mouse sperm fertilin b to mouse eggs: I. Evidence for adhesive activity via an egg b1 integrin-mediated interaction. *Dev. Biol.* 187, 79-93.

137. Evans, J.P., Schultz, R.M., and Kopf, G.S. (1997). Characterization of the binding of recombinant mouse sperm fertilin a to mouse eggs: II. Evidence for function as a cell adhesion molecule in sperm-egg binding. *Dev. Biol.* 187, 94-106.
138. Xu, Z., Abbott, A., Kopf, G.S., Schultz, R.M., and Ducibella, T. (1997). Spontaneous activation of ovulated mouse eggs: Time-dependent effects on M-phase exit, cortical granule exocytosis, maternal mRNA recruitment, and IP₃-sensitivity. *Biol. Reprod.* 57, 743-750.
139. Schultz, R.M., Albertini, D., Eppig, J., Fenwick, R., Hirshfield, A., Perreault-Darney, S., Wiley, L.M., and Strickland, S. (1997). Gamete-derived determinants. *Reprod. Tox.* 11, 293-308.
140. Schultz, R.M. (1998). Blastocyst. In "Encyclopedia of Reproduction", Knobil, e., Neill, J., eds., Academic Press, San Diego. In Press. Invited article, not reviewed.
141. Schultz, R.M. (1998). Gene expression in mouse embryos: Use of mRNA differential display. In "Advances in Molecular Biology: A Comparative Methods Approach to the Study of Oocytes and Embryos", Richter, J.D., ed. Cambridge University Press. In Press. Invited article, not reviewed.
142. Doherty, A.S., and Schultz, R.M. (1998). Culture of preimplantation mouse embryos. In "Developmental Biology Protocols", eds., Tuan, R.S., and Lo, C.W., Humana Press, Inc., Totowa, NJ. In Press.
143. Schultz, R.M. (1998). Preimplantation embryo development: A cell biological and molecular perspective. In "Molecular Biology in Clinical Reproductive Medicine", Fauser, B.C.M.M., ed. Pp. 313-331. Parthenon Publishing, Carnforth, UK. In Press.
144. Williams, C.J., Mehlmann, L.M., Jaffe, L.A., Kopf, G.S., and Schultz, R.M. (1998). Evidence that Gq family G proteins do not function in mouse egg activation at fertilization. *Dev. Biol.* 198, 116-127.
145. Evans, J.P., Schultz, R.M., and Kopf, G.S. (1998). Roles of the disintegrin domains of mouse fertilin a and b in fertilization. *Biol. Reprod.* 59, 145-152.
146. Brison, D.R., and Schultz, R.M. (1998). Increased incidence of apoptosis in TGF- α -deficient mouse blastocysts. *Biol. Reprod.* 59, 136-144.
147. Connors, S.A., Kinatsu-Shinohara, M., Schultz, R.M., and Kopf, G.S. (1998). Involvement of the cytoskeleton in the movement of cortical granules during oocyte maturation, and cortical granule anchoring and exocytosis in mouse eggs. *Dev. Biol.* 200, 103-115.
148. DeSousa, P.A., Watson, A.J., and Schultz, R.M. (1998). Transient expression of translation initiation factor eIF-1A in murine and bovine embryos: A hallmark of zygotic gene activation. *Biol. Reprod.* 59, 969-977.
149. Davis, W., Jr., and Schultz, R.M. (1998). Molecular cloning and expression of the mouse translation initiation factor eIF-1A. *Nuc. Acids Res.* 26, 4739-4747.

150. Abbott, A.L., Xu, Z., Kopf, G.S., Ducibella, T., and Schultz, R.M. (1998). In vitro culture retards spontaneous activation of cell cycle progression and cortical granule exocytosis that normally occur in in vivo unfertilized mouse eggs. *Biol. Reprod.* 59, 1515-1521.
151. Aoki, F., and Schultz, R.M. (1999). DNA replication in the 1-cell mouse embryo: Stimulatory effect of histone acetylation. *Zygote* 7, 165-172.
152. Schultz, R.M. (1999). The regulation and reprogramming of gene expression in the preimplantation embryo. In "Advances in Developmental Biochemistry", Wassarman, P.M., ed. vol. 5, pp. 127-162, JAI Press, Greenwich, Connecticut. Invited article, not reviewed.
153. Takahashi, M., Saka, N., Takahashi, H., Kanai, Y., Schultz, R.M., and Okano, A. (1999). Assessment of DNA damage in individual hamster embryos by Comet assay. *Mol. Reprod. Dev.* 54, 1-7
154. Schultz, R.M., Davis, W., Jr., Stein, P., and Svoboda, P. (1999). Reprogramming of gene expression during preimplantation development. *J. Exp. Zool.* 285, 276-282. Invited article, not reviewed.
155. Stein, P. and Schultz, R.M. (2000). Initiation of a chromatin-based transcriptionally repressive state in the preimplantation mouse embryo: Lack of a primary role for expression of somatic histone H1. *Mol. Reprod. Dev.* 55, 241-248.
156. Evans, J.P., Foster, J.A., McAvey, B.A., Gerton, G.L., Kopf, G.S., and Schultz, R.M. (2000). The effects of perturbation of cell polarity on molecular markers of sperm-egg binding sites in mouse eggs. *Biol. Reprod.* 62, 76-84..
157. Díaz-Cueto, L, Stein, P., Jacobs, A., Schultz, R.M., and Gerton, G.L. (2000). Modulation of mouse preimplantation embryo development by acrogranin (epithelin / granulin precursor). *Dev. Biol.* 217, 406-418.
158. Kubelka, M., Motlik, J., Schultz, R.M., and Pavlok, A. (2000). Butyrolactone I reversibly inhibits meiotic maturation of bovine oocytes, without influencing chromosome condensation activity. *Biol. Reprod.* 62, 292-302.
159. Davis, W., Jr., and Schultz, R.M. (2000). Developmental change in TATA-box utilization during preimplantation mouse development. *Dev. Biol.* 218, 275-283.
160. Costanzi, C., Stein, P., Worrada, D.M., Schultz, R.M., and Pehrson, J.R. (2000). Histone macroH2A1 is concentrated in the inactive X chromosome of female preimplantation mouse embryos. *Development* 127, 2283-2289.
161. Doherty, A.S., Mann, M.R.W., Tremblay, K.D., Bartolomei, M.S., and Schultz, R.M. (2000). Differential effects of culture on imprinted H19 expression in the preimplantation mouse embryo. *Biol. Reprod.* 62, 1526-1535.
162. Takahashi, M., Keicho, K., Takahashi, H., Ogawa, H., Schultz, R.M., and Okano, A. (2000). Effect of oxidative stress on development and DNA damage in in-vitro cultured bovine embryos by Comet assay. *Theriogenology.* 54, 137-145.

163. Kanatsu-Shinohara, M., Schultz, R.M., and Kopf, G.S. (2000). Acquisition of meiotic competence in mouse oocytes: Absolute amounts of p34^{cdc2}, cyclin B1, cdc25C, and wee1 in meiotically incompetent and competent oocytes. *Biol. Reprod.* 63, 1610-1616.
164. Svoboda, P., Stein, P., Hayashi, H., and Schultz, R.M. (2000). Selective destruction of dormant maternal mRNAs in mouse oocytes by RNA interference (RNAi). *Development.* 127, 4147-4156.
165. Schultz, R.M., Tremblay, K.D., Doherty, A.S., and Bartolomei, M.S. (2000). Effect of embryo culture on imprinted gene expression in the preimplantation mouse embryo. In "The Testis: From Stem Cell to Sperm Function". pp 245-255. Goldberg, E., ed., Springer-Verlag, New York. Invited article, not reviewed.
166. Schultz, R.M., Davis, W., Jr., and Svoboda, P. (2000). Reprogramming of gene expression during preimplantation development. In "Cloned Animals and Placentation", Roberts, R.M., Yanagimachi, R., Kariya, T., and Hashizume, K., eds, Yokendo, Tokyo. Pp. 47-50. Invited article, not reviewed.
167. Latham, K.E., de la Casa, E., and Schultz, R.M. (2000). Analysis of mRNA expression during preimplantation development. In "Developmental Biology Protocols", eds., Tuan, R.S., and Lo, C.W., pp. 315-331, Humana Press, Inc., Totowa, NJ. ..
168. Ma, J., Svoboda, P., Schultz, R.M., and Stein, P. (2001). Regulation of zygotic gene activation in the preimplantation mouse embryo: Global activation and repression of gene expression. *Biol. Reprod.* 64, 1713-1721.
169. Robson, P., Stein, P., Zhou, B., Schultz, R.M., and Baldwin, H.S. (2001). Inner cell mass-specific expression of a cell adhesion molecule (PECAM-1/CD31) in the mouse blastocyst. *Dev. Biol.* 234, 317-329.
170. Latham, K.E., and Schultz, R.M. (2001). Embryonic gene activation. *Frontiers in Bioscience*, 6, 748-759. Invited article, not reviewed.
171. Fuchimoto, D., Mizukoshi, A., Schultz, R.M., Sakai, S., and Aoki, F. (2001) Post-transcriptional regulation of cyclin A1 and cyclin A2 during mouse oocyte meiotic maturation and preimplantation development. *Biol. Reprod.* 65, 986-993.
172. Yu, J., Hecht, N.B., and Schultz, R.M. (2001). Expression of MSY2 in mouse oocytes and preimplantation embryos. *Biol. Reprod.* 65, 1260-1270.
173. Latham, K.E., and Schultz, R.M. (2001). Preimplantation embryo development. In "Molecular Biology in Clinical Reproductive Medicine", Fauser, B.C.M.M., ed. Parthenon Publishing, Carnforth, UK.
174. Svoboda, P., Stein, P., and Schultz, R.M. (2001). RNAi in mouse oocytes and preimplantation embryos: Effectiveness of hairpin dsRNA. *Biochem. Biophys. Res. Comm.* 287, 1099-1104.

175. Doherty, A.S., Bartolomei, M.S., and Schultz, R.M. (2002). Regulation of stage-specific nuclear translocation of Dnmt1o during preimplantation mouse development. *Dev. Biol.* 242, 255-266.
176. Stein, P., Svoboda, P., Stumpo, D.J., Blackshear, P.J., Lombard, D.B., Johnson, B., and Schultz, R.M. (2002). Analysis of the role of RecQ helicases in RNAi in mammals. *Biochem. Biophys. Res. Comm.* 291, 1119-1122.
177. Lincoln, A.J., Wickramasinghe, D., Stein, P., Schultz, R.M., Palko, M.E., Tessarollo, L., and Donovan, P.J. (2002). Requirement of Cdc25B phosphatase for progression from G2 to M phase in female meiosis. *Nature Genet.* 30, 446-449.
178. Kubelka, M., Anger, M., Pavlok, A., Kalous, J., Schultz, R.M., and Motlik, J. (2002). Activation of pig and cattle oocytes by butyrolactone I: A morphological and biochemical study. *Zygote* 10, 47-57.
179. Schultz, R.M., and Williams, C.J. (2002). The Science of ART. *Science* 296, 2188-2190.
180. Medvedev, S.Y., Tokunaga, T., Schultz, R.M., Furukawa, T., Nagai, T., Yamaguchi, M., Hhosoe, M., Yalovlev, A.F., Takahasi, S., and Izaïke, Y. (2002). Quantitative analysis of gene expression in preimplantation mouse embryos using green fluorescent protein reporter. *Biol. Reprod.* 67, 282-286.
181. Schultz, R.M. (2002). The molecular foundations of the maternal-to-zygotic transition in the preimplantation embryo. *Hum. Reprod. Update* 8, 323-331.
182. Kubelka, M., Anger, M., Kalous, J., Schultz, R.M., and Motlik, J. (2002). Chromosome condensation in pig oocytes: Lack of a requirement for either cdc2 kinase or MAP kinase activity. *Mol. Reprod. Dev.* 63, 110-118.
183. Yu, J., Hecht, N.B., and Schultz, R.M. (2002). RNA-binding properties and translation repression in vitro by germ cell-specific MSY2 protein. *Biol. Reprod.* 67, 1093-1098.
184. Ducibella, T., Huneau, D., Angelichio, E., Xu, Z., Schultz, R.M., Kopf, G.S., Fissore, R., Madoux, S., and Ozil, J.-P. (2002). Egg to embryo transition is driven by differential responses to Ca²⁺ oscillation number. *Dev. Biol.* 250, 280-291.
185. Zeng, F., and Schultz, R.M. (2003). Gene expression in mouse oocytes and preimplantation embryos: Use of suppression subtractive hybridization to identify oocyte- and embryo-specific genes. *Biol. Reprod.* 68, 31-39.
186. Stein, P., Svoboda, P., Anger, M., and Schultz, R.M. (2003). RNAi: Mammalian oocytes do it without RNA-dependent RNA polymerase. *RNA* 9, 187-192.
187. Aoki, F., Kentaro, H.T., and Schultz, R.M. (2003). Acquisition of transcriptional competence in the 1-cell mouse embryo: Requirement for recruitment of maternal mRNAs. *Mol. Reprod. Dev.* 64, 270-274.

188. Xu, Z., Williams, C.J., Kopf, G.S., and Schultz, R.M. (2003). Maturation-associated increase in IP₃ receptor type 1: Role in conferring increased IP₃ sensitivity and Ca²⁺ oscillatory behavior in mouse eggs. *Dev. Biol.* 254, 163-171.
189. Yu, J., Hecht, N.B., and Schultz, R.M. (2003). Requirement for RNA-binding activity of MSY2 for cytoplasmic localization and retention in mouse oocytes. *Dev. Biol.* 255, 249-262.
190. Stein, P., Svoboda, S., and Schultz, R.M. (2003). Transgenic RNAi in mouse oocytes: A simple and fast approach to study gene function. *Dev. Biol.* 256, 187-193.
191. Spruck, C.H., de Miguel, M.P., Smith, A.P.L., Ryan, A., Stein, P., Schultz, R.M., Lincoln, A.J., Donovan, P.J., and Reed, S.I. (2003). Essentiality of Cks2 for the first metaphase/anaphase transition of mammalian meiosis. *Science*, 300, 647-650.
192. Deng, M., Kishikawa, H., Yanagimachi, R., Kopf, G.S., Schultz, R.M., and Williams, C.J. (2003). Chromatin-mediated cortical granule redistribution is responsible for the formation of the cortical granule-free domain in mouse eggs. *Dev. Biol.* 257, 166-176.
193. C. Cho, Ha Jung-Ha, W.D. Willis, E.H. Goulding, P. Stein, Z. Xu, R.M. Schultz, N.B. Hecht, E.M. Eddy (2003). Protamine-2 deficiency leads to sperm DNA damage and embryo death in mice. *Biol. Reprod.* 69, 211-217.
194. Fedoriw, A.M., Stein, P., Svoboda, P., Schultz, R.M., and Bartolomei, M.S. (2004). Maternal CTCF requirement for appropriate DNA methylation of the imprinted H19 gene. *Science* 303, 238-240.
195. Ecker, D.J., Stein, P., Xu, Z., Williams, C.J., Kopf, G.S., Bilker, W.B., Abel, T., and Schultz, R.M. (2004). Long-term effects of culture of preimplantation mouse embryos on behavior. *Proc. Natl. Acad. Sci. USA.* 101, 1595-1600.
196. Yu, J., Deng, M., Medvedev, S., Yang, J., Hecht, N.B., and Schultz, R.M. (2004). Transgenic RNAi-mediated reduction of MSY2 in mouse oocytes results in reduced fertility. *Dev. Biol.* 268, 195-206.
197. Svoboda, P., Stein, S., Anger, M., Bernstein, E., Hannon, G.J., and Schultz, R.M. (2004). RNAi and expression of retrotransposons MuERV-L and IAP in preimplantation mouse embryos. *Dev. Biol.* 269, 276-285.
198. Anger A., Klima, J., Kubelka, M, Prochazka, R., Motlik, J., and Schultz, R.M. (2004). Timing of Plk1 and MPF activation during porcine oocyte maturation. *Mol. Reprod. Dev.* 69, 11-16.
199. Mann, M.R.W., Lee, S.S., Doherty, A.S., Verona R.I., Nolen, L.D., Schultz, R.M. and Bartolomei, M.S. (2004). Selective loss of imprinting in the placenta following preimplantation development in culture. *Development.* 131, 327-2735.
200. Zeng, F., Baldwin, D.A., and Schultz, R.M. (2004). Transcript profiling during preimplantation mouse development. *Dev. Biol.* 272, 483-496.

201. Rinaudo, P. and Schultz, R.M. (2004). Effects of embryo culture on global pattern of gene expression in preimplantation mouse embryos. *Reproduction* 128, 301-311.
202. Svoboda, P., Stein, P., Filipowicz, W., and Schultz, R.M. (2004). Lack of homologous sequence-specific DNA methylation in response to stable dsRNA expression in mouse oocytes. *Nucl. Acids Res.* 32, 3601-3606.
203. Tanaka, M., Kihara, M., Hennebold, J.D., Eppig, J.J., Viveiros M.M., Emery, B.R., Carrell, D.T., Kirkman, N.J., Meczekalski, B., Zhou, J., Bondy, C.A., Becker, M., Schultz, R.M., Misteli, T., De La Fuente, R., King, G.J., and Adashi, E.Y. (2004). H1foo is coupled to initiation of oocytic growth. *Biol. Reprod.* 72, 135-142.
204. Anger, M., Stein, P. and Schultz, R.M. (2005). CDC6 requirement for spindle formation during maturation of mouse oocytes. *Biol. Reprod.* 72, 188-194.
205. Pfister-Genskow, M., Myers, C., Childs, L., Lacson, J., Patterson, T., Betthausen, J., Goueleke, P., Koppang, R., Lange, G., Watt, S., Forsberg, E., Zheng, Y., Leno, G.H., Schultz, R.M., Yang, X., Hoeschele, I., and Eilerstsen, K.J. (2005). Identification of differentially expressed genes in individual bovine preimplantation embryos produced by nuclear transfer: Improper reprogramming of genes required for trophoblast development and implantation. *Biol. Reprod.* 72, 546-555.
206. Deng, M., Williams, C.J., and Schultz, R.M. (2005). Role of MAP kinase and myosin light chain kinase in chromosome-induced development of mouse egg polarity. *Dev. Biol.* 278, 358-366.
207. Knott, J.G., Kurokawa, M., Fissore, R.A., Schultz, R.M., and Williams, C.J. (2005). Transgenic RNAi reveals role for mouse sperm phospholipase C ζ in triggering Ca²⁺ oscillations during fertilization. *Biol. Reprod.* 72, 992-996.
208. Yang, J., Medvedev, S., Reddi, P.P., Schultz, R.M., and Hecht, N.B. (2005). The DNA/RNA-binding protein MSY2 marks specific transcripts for cytoplasmic storage in mouse male germ cells. *Proc. Natl. Acad. Sci. U.S.A.* 102, 1513-1518.
209. Michaut, M.A., Williams, C.J., and Schultz, R.M. (2005). Phosphorylated MARCKS: A novel centrosome component that also defines a peripheral subdomain of the cortical actin cap in mouse eggs. *Dev. Biol.* 280, 26-37.
210. Duncan, F.E., Moss, S.B., Schultz, R.M., and Williams, C.J. (2005). PAR-3 defines a central subdomain of the cortical actin cap in mouse eggs. *Dev. Biol.* 280, 38-47.
211. Ozil, J.-P., Markoulaki, S., Toth, S., Matson, S., Banrezes, B., Knott, J.G., Schultz, R.M., Huneau, D., and Ducibella, T. (2005). Egg activation events are regulated by the duration of a sustained [Ca²⁺]_{cyt} signal in the mouse. *Dev. Biol.* 282, 39-54.
212. Yan, W., Ma, L., Stein, S., Pangas, S.A., Burns, K.H., Bai, Y., Schultz, R.M., and Matzuk, M.M. (2005). An oocyte-specific oligoadenylate synthetase-like protein, OAS1D, inhibits the interferon/oligoadenylate synthetase/RNase L-mediated pathway in mouse oocytes. *Mol. Cell Biol.* 25, 4615-4624.

213. Yang, J., Medvedev, S., Yu, J., Tang, L.C., Agno, J.E., Matzuk, M.M., Schultz, R.M., and Hecht, N.B. (2005). Absence of the DNA/RNA-binding protein MSY2 results in male and female infertility. *Proc. Natl. Acad. Sci. USA* 102, 5755-5760.
214. Zeng, F., and Schultz, R.M. (2005). RNA transcript profiling during zygotic gene activation in the preimplantation mouse embryo. *Dev. Biol.* 283, 40-57.
215. Kalous, J., Solc, P., Baran, V., Kubelka, M., Schultz, R.M., and Motlik, J. (2006). PKB/AKT kinase activation precedes CDK1 kinase activation in mouse oocytes. *Biol. Cell.* 98, 111-123.
216. Schultz, R.M. (2005). From egg to embryo: a peripatetic journey. *Reproduction* 130, 825-828. Invited review.
217. Sommovilla, J., Bilker, W.B., Abel, T., and Schultz, R.M. (2005). Embryo culture does not affect longevity of offspring in mice. *Reproduction* 130, 599-601.
218. Hara, K.T., Oda, S., Naito, K., Nagata, M., Schultz, R.M., and Aoki, F. (2005). Cyclin A2-CDK2 regulates embryonic gene activation in 1-cell mouse embryos. *Dev. Biol.* 286, 102-113.
219. Pan, H., O'Brien, M.J., Wigglesworth, K., Eppig, J.J., and Schultz, R.M. (2005). Transcript profiling during mouse oocyte development and the effect of gonadotropin priming and development in vitro. *Dev. Biol.* 286, 493-506.
220. Stein, P., Zeng, F., Pan, H., and Schultz, R.M. (2005). Absence of non-specific effects of RNA interference triggered by long double-stranded RNA in mouse oocytes. *Dev. Biol.* 286, 464-471.
221. Ducibella, T., Schultz, R.M., and Ozil, J.P. (2006). Role of calcium signals in early development. *Sem. Dev. Biol.* 17, 324-332. Invited review, but reviewed.
222. Williams, C.J., and Schultz, R.M. (2006). Transgenic RNAi: A tool to study testis-specific genes. *Mol. Cell. Endocrin.* 247, 1-3. Invited review.
223. Yang, J., Medvedev, S., Yu, J., Schultz, R.M., and Hecht, N.B. (2006). Deletion of the DNA/RNA-binding protein MSY2 leads to post-meiotic arrest. *Mol. Cell. Endocrin.* 250, 20-24.
224. Ma, J., Zeng, F., Schultz, R.M., and Tseng, H. (2006). Basonuclin: A novel mammalian maternal-effect gene. *Development* 133, 2053-2062.
225. Mager, J., Schultz, R.M., Brunk, B., and Bartolomei, M.S. (2006). Identification of candidate maternal effect genes through comparison of multiple microarray data sets. *Mamm. Genome.* 17, 941-949.
226. Bultman, S.J., Gebur, T.C., Pan, H., Svoboda, P., Schultz, R.M., and Magnuson, T. (2006). Maternal BRG1 regulates zygotic genome activation in the mouse. *Genes Dev.* 20, 1744-1754.

227. Rinaudo, P.F., Ghiritaran, G., Dobson, A.T., and Schultz, R.M. (2006). Effects of oxygen tension on gene expression in preimplantation mouse embryos. *Fertil. Steril* 86, 1252-1265.
228. Knott, J.T., Gardner, A.J., Madgwick, S., Jones, K.T., Williams, C.W., and Schultz, R.M. (2006). Calmodulin-dependent protein kinase II triggers mouse egg activation and embryo development in the absence of Ca^{2+} oscillations. *Dev. Biol.* 296, 388-395.
229. Puschendorf, M., Stein, P., Oakeley, E.J., Schultz, R.M., Peters, A.H.F.M., and Svoboda, P. (2006). Abundant transcripts from retrotransposons are unstable in fully-grown mouse oocytes. *Biochem. Biophys. Res. Comm.* 347, 36-43.
230. Romanova, L.G., Anger, M., Zatssepina, O.V., and Schultz, R.M. (2006). Implication of the nucleolar protein SURF6 in ribosome biogenesis and preimplantation mouse development. *Biol. Reprod.* 75, 690-696.
231. Wang, J., Zhang, S., Schultz, R.M., and Tseng, H. (2006). Search for basoonin target genes. *Biochem. Biophys. Res. Comm.* 348, 1261-1271.
232. Ozil, J.P., Banrezes, B., Szabolcs, T., Pan, H., and Schultz, R.M. (2006). Ca^{2+} oscillatory pattern in fertilized mouse eggs affects gene expression and development to term. *Dev. Biol.* 300, 534-544.
233. Yang, J., Morales, C.R., Medvedev, S., Schultz, R.M., and Hecht, N.B. (2007). In the absence of the mouse DNA/RNA-binding protein MSY2 messenger RNA instability leads to spermatogenic arrest. *Biol. Reprod.* 76, 48-54.
234. Deng, M., Suraneini, P., Schultz, R.M., and Li, R. (2007). The Ran GTPase mediates chromatin signaling to control cortical polarity during polar body extrusion in mouse oocytes. *Dev. Cell* 12, 301-308.
235. Murchison, E.P., Stein, P., Xuan, Z., Pan, H., Zhang, M.Q., Schultz, R.M., and Hannon, G.J. (2007). Critical roles for Dicer in the female germline. *Genes and Development* 21, 682-693.
236. Vassena, R., Han, Z., Gao, S., Baldwin, D.A., Schultz, R.M., and Latham, K.E. (2007). Tough beginnings: alterations in the transcriptome of cloned embryos during the first two cell cycle. *Dev. Biol.* 304, 75-89.
237. Reese, K.J., Lin, S., Verona, R.I., Schultz, R.M., and Bartolomei, M.S. (2007). Maintenance of paternal methylation and repression of the imprinted H19 gene requires MBD3. *PLoS Genetics*. *PLoS Genetics* 3, e137.
238. Schultz, R.M. (2007). Of light and mouse embryos: Less is more. *Proc. Natl. Acad. Sci. USA* 104, 14547-14548.
239. Igarashi, H., Knott, J.G., Schultz, R.M., and Williams, C.J. (2007). Alterations in PLC β 1 in mouse eggs change calcium oscillatory behavior following fertilization. *Dev. Biol.* 312, 321-330.

240. Rivera, R.M., Stein, P., Weaver, J.R., Mager, J., Schultz, R.M., and Bartolomei, M.S. (2008). Manipulations of mouse embryos prior to implantation result in aberrant expression of imprinted genes on day 9.5 of development. *Hum. Mol. Genet.* 17, 1-14.
241. Pan, H., Ma, P., Zhu, W., and Schultz, R.M. (2008). Age-associated increase in aneuploidy and changes in gene expression in mouse eggs. *Dev. Biol.* 316, 397-407.
242. Tseng, H., Chou, W., Zhang, X., Zhang, S., and Schultz, R.M. (2008). Mouse ribosomal RNA genes contain multiple differentially regulated variants. *PLoS One.* E1843.
243. Solc, P., Saskova, A., Baran, V., Kubelka, M., Schultz, R.M., and Motlik, J. (2008). CDC25A phosphatase controls meiosis I progression in mouse oocytes. *Dev. Biol.* 317, 260-269.
244. Tam, O.H., Aravin, A.A., Stein, P., Girard, A., Murchison, E.P., Cheloufi, S., Hodges, E., Anger, M., Sachidanandam, R., Schultz, R.M., and Hannon, G.J. (2008). Pseudogene-derived siRNAs regulate gene expression in mouse oocytes. *Nature.* 453, 534-538.
245. Ma, P. and Schultz, R.M. (2008). Histone deacetylase 1 (HDAC1) regulates histone acetylation, development, and gene expression in preimplantation mouse embryos. *Dev. Biol.* 319, 110-120.
246. Saskova, A., Solc, P., Vladimír, B., Kubelka, M., Schultz, R.M., and Motlik, J. (2008). Aurora Kinase A controls meiosis I progression in mouse oocytes. *Cell Cycle.* 7, 2368-2376.
247. Duncan, F.E., Stein, P., Williams, C.J., and Schultz, R.M. (2008). The effect of blastomere biopsy on preimplantation mouse embryo development and global gene expression. *Fertil. Steril.* In Press.
248. Medvedev, S., Yang, J., Hecht, N.B., and Schultz, R.M. (2008). CDC2A (CDK1)-mediated phosphorylation of MSY2 triggers maternal mRNA degradation during mouse oocyte maturation. *Dev. Biol.* 321, 205-215.
249. Wan, L-B., Pan, H., Hannenhalli, S., Cheng, Y., Ma, J., Fedoriw, A., Lobanenkov, V., Latham, K.E., Schultz, R.M., and Bartolomei, M.S. (2008). Maternal depletion of CTCF reveals multiple functions during oocyte and preimplantation embryo development. *Development* 135, 2729-2738
250. Ihara, M., Stein, P., and Schultz, R.M. (2008). UBC9, a SUMO-conjugating enzyme, localizes to nuclear speckles and stimulates transcription in mouse oocytes. *Biol. Reprod.* 79, 2368-2376.
251. Schindler, K. and Schultz, R.M. (2008). CDC14B acts through FZR1 (CDH1) to prevent meiotic maturation of mouse oocytes. *Biol. Reprod.* 80, 795-803.
252. Schindler, K. and Schultz, R.M. (2009). The CDC14A phosphatase regulates oocyte maturation in mouse. *Cell Cycle.* 8, 1090-1098.

253. Shuda, K., Schindler, K., Ma, J., Schultz, R.M., and Donovan, P.J. (2009). Aurora kinase B modulates chromosome alignment in mouse oocytes. *Mol. Reprod. Dev.* 76, 1094-1105.
254. Duncan, F.E., Chiang, T., Schultz, R.M., and Lampson, M.A. (2009). Evidence that a defective spindle assembly checkpoint is not the primary cause of maternal age-associated aneuploidy in mouse eggs. *Biol. Reprod.* 81, 768-776.
255. Buffone, M.G., Schindler, K., and Schultz, R.M. (2009). Over-expression of CDC14B causes mitotic arrest and inhibits zygotic genome activation in mouse preimplantation embryos. *Cell Cycle.* 8, 3904-3913.
256. Backs, J., Stein, P., Backs, T., Duncan, F.E., Grueter, C.E., McAnnally, J., Qi, X., Schultz, R.M., and Olson, E.N. (2009). The γ isoform of CaM kinase II controls mouse egg activation by regulating cell cycle resumption. *Proc. Natl. Acad. Sci. USA.* 107, 81-86
257. Ma, Jun, Flemr, M., Stein, P., Berninger, P., Malik, R., Zavolan, M., Svoboda, P., and Schultz, R.M. (2009). microRNA activity is suppressed in mouse oocytes. *Curr. Biol.* 9, 265-270.
258. Schultz, R.M. (2009). PKA and CDC25B: at last connected. *Cell Cycle* 15, 516-517.
259. Flemr, M., Ma, J., Schultz, R.M., and Svoboda, P. (2010). P-body loss is concomitant with formation of an mRNA storage domain in mouse oocytes. *Biol. Reprod.* 82, 1008-1017.
260. Murai, S., Stein, P., Buffone, M.B., Yamashita, S., and Schultz, R.M. (2010). Recruitment of Orc6l, a dormant maternal mRNA in mouse oocytes, is essential for DNA replication in 1-cell embryos. *Dev. Biol.* 341, 205-212.
261. Chiang, T., Duncan, F.E., Schindler, K., Schultz, R.M., and Lampson, M.A. (2010). Evidence that weakened centromere cohesion is a leading cause of age-related aneuploidy in oocytes. *Curr. Biol.* 14, 1522-1528.
262. Ma, P., Lin, S., Bartolomei, M.S., and Schultz, R.M. (2010). Metastasis Tumor Antigen 2 (MTA2) is involved in proper imprinted expression of *H19* and *Peg3* during mouse preimplantation development. *Biol. Reprod.* 83, 1027-1035.
263. Duncan, F.E., and Schultz, R.M. (2010). Gene expression profiling of mouse oocytes and preimplantation embryos. *Meth. Enzymol.* 477, 457-480. Invited article, not reviewed.
264. Stein, P. and Schultz, R.M. (2010). ICSI in the mouse. *Meth. Enzymol.* 476, 251-262. Invited article, not reviewed.
265. Solc, P., Schultz, R.M., and Motlik, J. (2010). Prophase I arrest and progression to metaphase I in mouse oocytes: comparison of resumption of meiosis and recovery from G2-arrest in somatic cells. *Mol. Hum. Reprod.* 16, 654-664.

266. Ihara, M., Tseng, H. and Schultz, R.M. (2011). Expression of variant ribosomal RNA genes in mouse oocytes and preimplantation embryos. *Biol. Reprod.* 84, 944-966..
267. Mainigi, M.A., Ord, T., and Schultz, R.M. (2011). Meiotic and developmental competence are compromised following follicle development *in vitro* using an alginate-based culture system. *Biol. Reprod.* 85, 269-276.
268. Pan, H., and Schultz, R.M. (2011). SOX2 modulates reprogramming of gene expression in 2-cell mouse embryos. *Biol. Reprod.* 85, 409-416.
269. Medvedev, S., Pan H., and Schultz, R.M. (2011). Absence of MSY2 in mouse oocytes perturbs oocyte growth and maturation, RNA stability, and the transcriptome. *Biol. Reprod.* 85, 575-583.
270. Lin, S., Ferguson-Smith, A.C., Schultz, R.M., and Bartolomei, M.S. (2011). Nonallelic transcriptional roles of CTCF and cohesins at imprinted loci. *Mol. Cell. Biol.* 31, 3094-3104.
271. Chiang, T., Schultz, R.M., and Lampson, M.A. (2011). Age-dependent susceptibility of chromosome cohesion to premature separase activation in mouse oocytes. *Biol. Reprod.* 85, 1279-1283.
272. Chiang, T., Schultz, R.M., and Lampson, M.A. (2011). Meiotic origins of maternal age-related aneuploidy. *Biol. Reprod.* 86, 1-7.
273. Banrezes, B., Sainte-Beuve, T., Canon, E., Schultz, R.M., Cancela, J., and Ozil, J.P. (2011). Adult body weight is programmed by a redox-regulated and energy-dependent process during the pronuclear stage in mouse. *PLoS One.* 6, e29388. PMID:22216268
274. Ma, P., Pan, H., Montgomery, R.L., Olson, E.N., and Schultz, R.M. (2012). Compensatory functions of HDAC1 and HDAC2 regulate transcription and apoptosis during mouse oocyte development. *Proc. Natl. Acad. Sci. USA.* 109, E481-489. PMC3286984
275. Schindler, K., Davydenko, O., Fram, Brianna, Lampson, M.A., and Schultz, R.M. (2012). Maternally-recruited Aurora C kinase is more stable than Aurora B to support mouse oocyte maturation and early development. *Proc. Natl. Acad. Sci. USA.* 109, E215-2222. PMC3421190
276. Duncan, F.E., Hornick, J.E., Lampson, M.A., Schultz, R.M., Shea, L.E., and Woodruff, T.K. (2012). Chromosome cohesion decreases in human eggs with advanced maternal age. *Aging Cell.* 11, 1121-1124. PMC3491123
277. Solc, P., Baran, V., Mayer, A., Bohmova, T., Panenkova-Havlova, G., Saskova, A., Schultz, R.M., and Motlik, J. (2012). Aurora Kinase A drives MTOC biogenesis but does not trigger resumption of meiosis in mouse oocytes matured *in vivo*. *Biol. Reprod.* 87, 1-12. PMC3507544

278. Ma, J., Flemr, M., Strnad, H., Svoboda, P., and Schultz, R.M. (2012). Maternally-recruited DCP1A and DCP2 1 contribute to mRNA degradation during oocyte maturation and genome activation in mouse. *Biol. Reprod.* 88, 1-12. PMID: 23136299
279. Stein, P., Svoboda, P., and Schultz, R.M. (2013). RNAi-based methods for gene silencing in mouse oocytes. *Methods Mol. Biol.* 957, 135-151. PMID:23138949
280. Oh, J.S., Susor, A., Schindler, K., Schultz, R.M., and Conti, M. (2013). Cdc25A activity is required for the metaphase II arrest in mouse oocytes. *J. Cell Sci.* 126, 1081-1085. PMC3635459
281. Ma, P. and Schultz, R.M. (2013). Histone deacetylase 2 (HDAC2) regulates chromosome segregation and kinetochore function via H4K16 deacetylation during oocyte maturation in mouse. *PLoS Gen.* 9(e)1003377. PMC3597510
282. Curia, C.A., Ernesto, J.I., Stein, P., Busso, D., Schultz, R.M., Cuasnicu, P.S., and Cohen, D.J. (2013). Fertilization induces a transient exposure of phosphatidylserine in mouse eggs. *PLoS One.* 8:e71995. PMC3737209
283. Davydenko, O, Schultz, R.M., and Lampson, M.A. (2013). Increased CDK1 activity determines the timing of kinetochore-microtubule attachments in meiosis I. *J. Cell Biol.* 202, 221-229. PMC3718970
284. Balboula, A.Z., Stein, P., Schultz, R.M., and Schindler, K. (2013). Knockdown of RBBP7 unveils a requirement for histone deacetylation for CPC function in mouse oocytes. *Cell Cycle.* 13, 600-611. PMID:24317350
285. DeWaal, E., Mak, W., Calhoun, S., Stein, P. Ord, T., Krapp, C., Coutifaris, C., Schultz, R.M., and Bartolomei, M.S. (2013). In vitro culture increases the frequency of stochastic epigenetic errors at imprinted genes in placental tissues from mouse concepti produced through assisted reproductive technologies. *Biol. Reprod.* 90, 22, 1-12. PMID:24337315
286. Medvedev, S., Stein, P., and Schultz, R.M. (2014). Specificity of calcium/calmodulin-dependent protein kinases in mouse egg activation. *Cell Cycle.* 13, 1482-1488.
287. Ihara, M., Meyer-Ficca, M.L., Leu, N.A., Rao, S., Li, F., Gregory, B.D., Zalenskaya, I.A., Schultz, R.M., and Meyer, R.G. (2014). Paternal poly(ADP-ribose) metabolism modulates retention of inheritable sperm histones and early embryonic gene expression. *PLoS Genetics.* e1004317.
288. Liu, W., Stein, P., Cheng, X., Yang, W., Shao, N-Y., Morrisey, E.E., Schultz, R.M., and You, J. (2014). BRD4 regulates *Nanog* expression in mouse embryonic stem cells and preimplantation embryos. *Cell Death and Differentiation.* 21, 1950-1960.
289. Chmátal, L., Gabriel, S.I., Mitsainas, G.P., Martínez-Vargas, J., Ventura, J., Searle, J.B., Schultz, R.M., and Lampson, M.A. (2014). Centromere strength provides the cell biological basis for meiotic drive and karyotype evolution in mice. *Curr. Biol.* 24, 2295-2300.

290. Stein, P., Rozhkov, N.V., Li, f., Cárdenas, F.L., Davydenko, O., Vandivier, L.E., Gregory, B.D., Hannon, G.J., and Schultz, R.M. (2015). Essential role for endogenous siRNAs during meiosis in mouse oocytes. *PLoS Genetics*. 11:e1005013.
291. Svoboda, P., Franke, V., and Schultz, R.M. (2015) Sculpting the transcriptome during the oocyte-to-embryo transition in mouse. *Curr. Top. Dev. Biol.* 113, 305-349.
292. Abe, K., Yamamoto, R., Franke, V., Cao, M., Suzuki, Y., Suzuki, M.G., Vlahovicek, K., Svoboda, P., Schultz, R.M., and Aoki, F. (2015). The first murine zygotic transcription is promiscuous and uncoupled from splicing and 3' processing. *EMBO J.* 34, 1523-1537.
293. Chamtal, L., Yang, K., Schultz, R.M., and Lampson, M.A. (2015). Spatial regulation of kinetochore microtubule attachments by destabilization at spindle poles in meiosis I. *Curr. Biol.* 25, 1835-1841.
294. Balboula, A.Z., Stein, P., Schultz, R.M., and Schindler, K. (2015). RBBP4 regulates histone deacetylation and bipolar spindle assembly during oocyte maturation in the mouse. *Biol. Reprod.* 92, 1-12.
295. Ma, J., Fujuka, Y., and Schultz, R.M. (2015). Mobilization of dormant *Cnot7* mRNA promotes deadenylation of maternal transcripts during mouse oocyte maturation. *Biol. Reprod.* 93, 48.
296. Jimenez, R., Melo E.O., Davydenko, O., Ma, J., Mainigi, M., Franke, V., and Schultz, R.M. (2015). Maternal SIN3A regulates reprogramming of gene expression during mouse preimplantation development. *Biol. Reprod.* 93, 89.
297. Zhou, J., Stein, P., Leu, N.A., Chmatal, L., Xue, J., Ma, J., Huang, X., Lampson, M.A., Schultz, R.M., and Wang, P.J. (2015). Accelerated reproductive aging in females lacking a novel centromere protein SYCP2L. *Hum. Mol. Genet.* 24, 6505-6514.
298. de Waal, E., Vrooman, L.A., Fischer, E., Ord, T., Maninigi, M.A., Coutifaris, C., Schultz, R.M., and Bartolomei, M.S. (2015). The cumulative effect of assisted reproduction procedures on placental development and epigenetic perturbations in a mouse model. *Hum. Mol. Genet.* 24, 6975-6985.
299. Ma, P., de Waal, E., Weaver, J.R., Bartolomei, M.S., and Schultz, R.M. (2015). A DNMT3A2-HDAC2 complex is essential for genomic imprinting and genome integrity in mouse oocytes. *Cell Reports*. 13, 1552-1560.
300. Mayer, A., Baran, V., Sakakibara, Y., Brzakova, A., Ferencova, I., Motlik, J., Kitajima, T.S., Schultz, R.M., and Solc, P. (2016). DNA damage response during mouse oocyte maturation. *Cell Cycle*. 15, 546-558.
301. Weirnerman, R., Feng, R., ord, T.S., Schultz, R.M., Bartolomei, M.S., Coutifaris, C., and Maingini, M. (2016). Morphokinetic evaluation of embryo development in a mouse model: Functional and molecular correlates. *Biol. Reprod.* 94, 84.
302. Smoak, E.M., Stein, P., Schultz, R.M., Lampson, M.A., and Black, B. (2016). Long-term retention of CENP-A nucleosomes in mammalian oocytes underpins transgenerational inheritance of centromere identity. *Curr. Biol.* 25, 1110-1116.

303. Ma, P. and Schultz, R.M. (2016). HDAC1 and HDAC2 in mouse oocytes and preimplantation embryos: specificity versus compensation. *Cell Death and Differentiation*. 23, 1119-1127.
304. Franke, V., Ganesh, S., Karlic, R., Malik, R., Pasulka, J., Horvat, F., Kuzman, M., Cernohorska, M., Urbanova, J., Svobodova, E., Ma, J., Suzuki, Y., Aoki, F., Schultz, R.M., Vlahovicek, K., and Svoboda, P. (2017). Long terminal repeats power evolution of genes and gene expression programs in mammalian oocytes and zygotes. *Genom. Res.* 27, 1384-1394.
305. Chmatal, L., Schultz, R.M., Black, B.E., and Lampson, M.A. (2017). Cell biology of cheating—transmission of centromeres and other selfish elements through asymmetric meiosis. *Progress in Molecular and Subcellular Biology*, 56, 377-396.
306. Iwata-Otsubo, A., Akeru, T., Falk, S.J., Chmatal, L., Yang, K., Sullivan, G.A., Schultz, R.M., Lampson, M.A., and Black, B.E. (2017). Amplified satellite repeats act as selfish elements in female meiosis. *Curr. Biol.* 27, 2365-2373.
307. Akeru, T., Chmatal, L., Trimm, E., Yang, K., Aonbangkhen, C., Chenoweth, D.M., Janke, C., Schultz, R.M., and Lampson, M.A. (2017). Spindle asymmetry drives non-Mendelian chromosome segregation. *Science*. 358, 668-672.
308. Chung, N., Bogliotti, Y.S., Ding, W., Chitwood, J.L., Schultz, R.M., and Ross, P.J. (2017). Active H3K27me3 demethylation by KDM6B is required for normal development of bovine preimplantation embryos. *Epigenetics*. 12, 1048-1056.
309. Schultz, R.M., Stein, P., and Svoboda, P. (2018). The oocyte-to-embryo transition: past, present, and future. *Biol. Reprod.* 99,160-174.
310. Kasowitz, S.D., Ma, J., Anderson, S.J., Leu, N.A., Xu, Y., Gregory, B.D., Schultz, R.M., and Wang, J.P. (2018). Nuclear m6A reader YTHDC1 regulates alternative polyadenylation and splicing during mouse oocyte development. *PLoS Genetics*. 14, e1007412
311. Abe, K., Funaya, S., Tukioka, D., Kawamura, M., Suzuki, Y., Suzuki, M., Schultz, R.M., and Aoki, F. (2018). Minor zygotic gene activation is essential for mouse preimplantation development. *Proc. Natl. Acad. Sci., USA*. 115, E6780-E6788.
312. Horvat, F., Fulka, H., Jankele, R., Malik, R. Jun, M., Solcova, K., Sedlacek, R., Vlahovicek, K., Schultz R.M., and Svoboda, P. (2018). Role of *Cnot6l* in maternal mRNA turnover. *Life Sci. Alliance*. In Press.