

www.latsis2017.ethz.ch

LATSIS SYMPOSIUM 2017

**Transgenerational Epigenetic Inheritance:
Impact for Biology and Society**

28-30 August 2017
ETH Zurich, Switzerland



**Universität
Zürich** ^{UZH}

ETH zürich



FONDATION LATSIS
Internationale

Important information

WIFI:

Username: Latsis Symposium

Password: Latsis2017

Emergency: 144

Police: 117

Zurich Public Transport: www.zvv.ch

Taxi: +41 44 777 77 77

Venue

Auditorium Maximum (HG F 30)

ETH Zurich Main Building

Rämistrasse 101

8092 Zurich

www.ethz.ch

WELCOME



Dear colleagues, dear friends,

This is a great honor to host the 2017 Latsis Symposium on Transgenerational Epigenetic Inheritance, and to welcome you all to Zürich for this wonderful occasion. This is a special event, because it is one of the first conferences fully dedicated to the theme of transgenerational epigenetic inheritance, the study of how acquired traits can be passed to the offspring through epigenetic changes in the germline. The symposium gathers pioneers in the field, covers scientific aspects from invertebrates to humans, and reflects on major societal implications.

The main objectives of this symposium are to provide a platform for thought leaders in the field to discuss the current state of research, consider what newly gained findings can bring to biology, and open novel perspectives for medical research. Transgenerational epigenetic inheritance is a very dynamic and vibrant

field, that holds great promises for current and future generations of researchers. Through this symposium and the associated LS2 workshop, we wish to provide the opportunity to learn, exchange ideas and debate about new advances and discoveries. We will discuss the inherent difficulties associated with this multidisciplinary discipline, and brainstorm about innovative approaches to address these challenges. To communicate to the public, a general lecture in German will introduce the lay audience to this field of research and its impact on society.

We hope that you'll enjoy the conference, and that you will find it inspiring for your research and your thinking about the biology of heredity. We wish you a great time and warmly thank you for participating.

Isabelle Mansuy on behalf of the organizers

SPEAKERS

Marine Baptissart, North Carolina State University, USA

Marisa Bartolomei, University of Pennsylvania, USA

Stephan Beck, University College London, UK

Christoph Bock, University of Vienna, AT

Liran Carmel, Hebrew University of Jerusalem, IL

Jill Escher, Escher Fund for Autism of San Jose, USA

Katharina Gapp, Sanger Institute, Cambridge, UK

Johannes Graeff, Ecole Polytechnique Fédérale, Lausanne, CH

Carlos Guerrero-Bosagna, Linköping University, SE

Leah Hourì-Ze'evi, Tel Aviv University, IL

Eva Jablonka, Tel Aviv University, IL

Josep Jiménez-Chillarón, Hospital Sant Joan de Deu, Barcelona, SP

Maurizio Meloni, University of Sheffield, UK

Eric Miska, University of Cambridge, UK

Ruth Müller, Technical University Munich, DE

Marcus Pembrey, University College London, UK

Vardhman Rakyan, Blizard Institute, London, UK

Minoo Rassoulzadegan, University of Nice, FR

Abhay Sharma, CSIR-Institute of Genomics and Integrative Biology, IN

Michael Skinner, Washington State University, USA

Adelheid Soubry, Catholic University Leuven, BE

Peter Spork, Wissenschaftsautor, Hamburg, DE

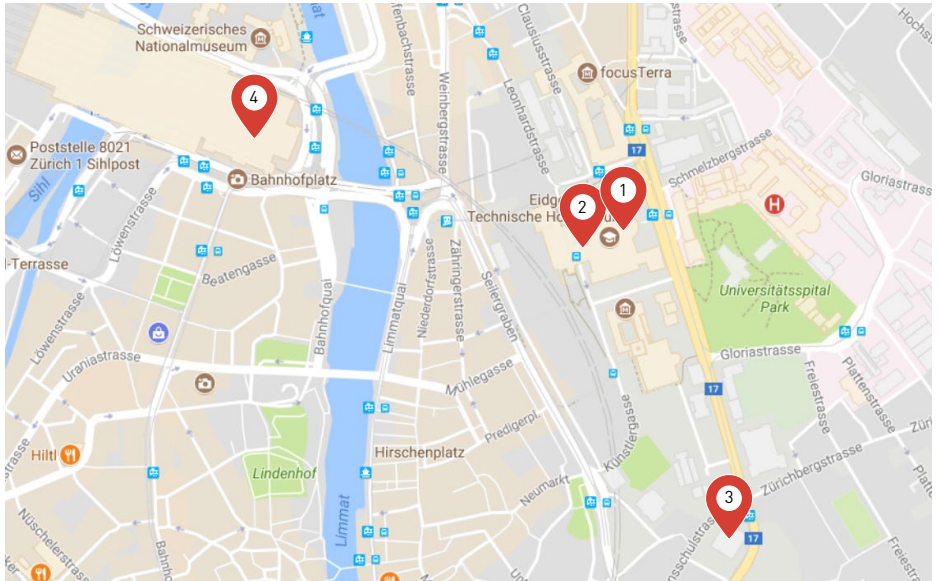
Moshe Szyf, McGill University, Montreal, CA

Jorg Tost, Energies and Atomic Energy Commission, Evry, FR

Gretchen Van Steenwyk, University and ETH Zurich, CH

Rachel Yehuda, Mount Sinai Hospital, New York, USA

VENUE



-
1. **Latsis Symposium**, ETH Zurich, HG F 30, Rämistrasse 101, 8092 Zurich
 2. **Terrace Dinner**, ETH Zurich, HG K 30.5, Rämistrasse 101, 8092 Zurich (upon registration only)
 3. **LS2 Workshop** University of Zurich, RAA-E-30, Rämistrasse 59, 8092 Zurich
 4. **Zürich HB / Zurich main station**
-

Direction for Public Transportation

Tram Nr. 6, 10, 3 || From Zurich main station to ETH/Universitätsspital || Ticket: Zone 110

PROGRAM

Monday 28.08.2017

08:00 – 08:45 Registration

Introduction

08:45 – 09:00 Isabelle Mansuy, Professor in Neuroepigenetics, University and ETH Zurich

Frédéric Merkt, Board of the Latsis Foundation, ETH Zurich

Detlef Günther, Vice-President of Research and Corporate Relations, ETH Zurich

Session 1 **Epidemiological evidence for epigenetic inheritance**

Chair: Isabelle Mansuy, University and ETH Zurich

09:00 – 09:45 **Impact of early life experience (food supply, smoking) on future generations**

Marcus Pembrey, University College London, UK

09:45 – 10:30 **Paternal origins of health and disease (POHaD)**

Adelheid Soubry, Catholic University Leuven, BE

10:30 – 11:00 *Coffee Break - Floor F, Uhrenhalle Foyer*

11:00 – 11:45 **Multi and transgenerational consequences of BPA exposure in a mouse model**

Marisa Bartolomei, University of Pennsylvania, USA

11:45 – 12:00 **Paternal cholestasis induces transgenerational abnormalities via TGR5 signaling pathways in mouse**

Marine Baptissart, North Carolina State University, USA

12:00 – 12:15 **Escher Fund for Autism: Investigating germ cell exposures and neurodevelopmental outcomes**

Jill Escher, Escher Fund for Autism of San Jose, USA

12:30 – 13:30 *Lunch Break - Floor F, Uhrenhalle Foyer*

Session 2

Cross- and transgenerational inheritance in animals : Environmental models

Chair: Eric Miska, University of Cambridge, UK

13:30 – 14:15 **Cross and transgenerational epigenetic transmission of adverse experience: Possible role for glucocorticoids**
Moshe Szyf, McGill University, Montreal, CA

14:15 – 15:00 **Transgenerational epigenetic inheritance of diabetes risk**
Josep Jimenez-Chillarón, Hospital Sant Joan de Deu, Barcelona, ES

15:00 – 16:00 *Coffee Break and Poster Session - Floor F, Uhrenhalle Foyer*

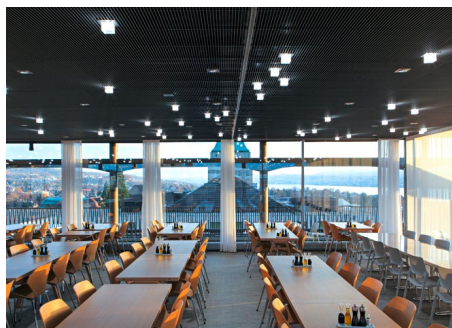
16:00 – 16:45 **The epigenetic state of ribosomal DNA provides a molecular memory of in utero gene-environment interactions**
Vardhman Rakyan, Blizard Institute, London, UK

16:45 – 17:00 **Chicken diversification and the germ line epigenome in generating genomic evolutionary novelties**
Carlos Guerrero-Bosagna, Linköping University, SE

17:00 – 17:45 **Effect of trauma on second generation offspring (video lecture)**
Rachel Yehuda, Mount Sinai Hospital, New York, USA



18:30 – 22:00 **Terrace Dinner at ETH Dozentenfoyer (upon registration only)**



ETH Dozentenfoyer

ETH Zurich
HG K 30.5
Rämistrasse 101
8092 Zurich

PROGRAM

Tuesday 29.08.2017

08:15 – 08:45 Registration

Session 3 **Transmission mechanisms : Plausibility and evidence of the involvement of the germline**

Chair: Johannes Bohacek, ETH Zurich

08:45 – 09:30 **Role of environmentally induced epigenetic transgenerational inheritance in disease and evolution: Germline molecular mechanisms involved**
Michael Skinner, Washington State University, USA

09:30 – 10:15 **Sperm RNA controls in epigenetic heredity: “Cas d’école” from paramutation to telomere biology**
Minoo Rassoulzadegan, University Nice, FR

10:15 – 10:30 **Mechanisms of transgenerational paternal transmission of the effects of trauma**
Gretchen van Steenwyk, University and ETH Zurich, CH

10:30 – 11:00 *Coffee Break - Floor F, Uhrenhalle Foyer*

11:00 – 11:45 **Transgenerational epigenetic inheritance of metabolic perturbations in Drosophila**
Abhay Sharma, Delhi University Campus, IN

11:45 – 12:00 **Early life trauma: Transgenerational effects and mechanisms in mice**
Katharina Gapp, Sanger Institute, Cambridge, UK

12:00 – 12:15 **Transgenerational fates of inheritance in C. elegans**
Leah Hourì-Ze’evi, Tel Aviv University, IL

12:30 – 13:30 *Lunch Break - Floor F, Uhrenhalle Foyer*

Session 4

Methodological challenges and computational aspects of epigenetic mapping

Chair: Marisa Bartolomei, University of Pennsylvania, USA

13:30 – 14:15 **The EMBO Keynote Lecture: Transgenerational dreams of nematodes**
Eric Miska, University of Cambridge, UK

14:15 – 15:00 **Tools for the engineering of the Epigenome: Creation of stable epigenome alterations for future generations?**
Jorg Tost, Energies and Atomic Energy Commission, Evry, FR

15:00 – 16:00 *Coffee Break and Poster Session - Floor F, Uhrenhalle Foyer*

16:00 – 16:45 **High-throughput analysis and interpretation of DNA methylation patterns**
Christoph Bock, Research Center for Molecular Medicine, University of Vienna, AT

16:45 – 17:00 **An epigenetic 3D view of the genome: Disease-associated chromatin looping**
Johannes Graeff, Ecole Polytechnique Fédérale de Lausanne, CH

17:30 – 18:30 **Öffentliche Vorlesung (Public Lecture)**
Moderation: Johannes Bohacek, ETH Zurich

FREIER
EINTRITT



**Erbe, Umwelt und Vergangenheit:
Warum die Epigenetik den Blick auf
die Gesundheit verändert**

Peter Spork, Wissenschaftsautor,
Hamburg, DE

Weitere Informationen auf Seite 12

PROGRAM

Wednesday 30.08.2017

Session 5 **Epigenetic inheritance and impact on society and evolution**
Chair: Gerhard Schratt, ETH Zurich

09:00 – 09:45	Transgenerational epigenetic inheritance and the evolution of forgetting Eva Jablonka, Tel Aviv University, IL
09:45 – 10:30	Insights from methylome analysis Stefan Beck, University College London, UK
<i>10:30 – 10:45</i>	<i>Coffee Break - Floor F, Uhrenhalle Foyer</i>
10:45 – 11:30	Paleoepigenetics: Insights on human recent evolution from DNA methylation maps of archaic humans Liran Carmel, Hebrew University, Jerusalem, IL
11:30 – 12:00	Plastic genomes, plastic heredity: possible political implications of epigenetics Maurizio Meloni, University of Sheffield, UK
12:00 – 12:30	Epigenetic inheritance and health in society: Whose responsibility? Ruth Müller, Technical University of Munich, DE
12:30 – 12:45	Poster Prize / Closing

WORKSHOP

Wednesday 30.08.2017

Life Sciences Switzerland Workshop

13:00 – 14:00 *Lunch - RAA Lichthof*

14:00 – 17:00 **Questions and answers on transgenerational epigenetic inheritance**

Eva Jablonka, Tel Aviv University, IL

Isabelle Mansuy, University and ETH Zurich, CH

Michael Skinner, Washington State University, USA

Moshe Szyf, McGill University, Montreal, CA

Organized by Olivia Engmann, University and ETH Zurich, CH
Juliet Richetto, University of Zurich, CH
Ulrike Weber-Stadlbauer, University of Zurich, CH

Supported by

LS²
Life Sciences Switzerland

sc | nat
Swiss Academy of Sciences
Akademie der Naturwissenschaftler
Accademia di scienze naturali
Académie des sciences naturelles



Workshop

University of Zurich
Building RAA-E30
Rämistrasse 59
8092 Zurich

ÖFFENTLICHE VORLESUNG



Erbe, Umwelt und Vergangenheit: Warum die Epigenetik den Blick auf die Gesundheit verändert

Peter Spork, Wissenschaftsautor, Hamburg, DE

Unsere Gesundheit beginnt bei den Großeltern und wird bei unseren Enkeln nicht enden. Dieser Vortrag zeigt, was uns die Epigenetik über Entstehung und Vererbung von Gesundheit verrät. Die moderne Molekularbiologie – vor allem die Epigenetik – ermöglicht uns derzeit einen völlig neuen Blick auf uns selbst: Persönlichkeit, Gesundheit und Lebenserwartung sind das untrennbare, gemeinsame Resultat aus dem Zusammenspiel tausender Gene mit den

epigenetisch gespeicherten, teils Jahrzehnte oder vielleicht sogar eine oder zwei Generationen zurückliegenden Einflüssen der Umwelt auf die Genregulation.

Wir haben unsere Gesundheit also ein gutes Stück selbst in der Hand. Denn Gesundheit ist kein Zustand. Gesundheit ist auch nicht das Gegenteil von Krankheit. Wir werden nicht gesund oder krank geboren. Gesundheit ist ein andauernder Prozess. Sogar die Erfahrungen der Eltern und Großeltern, deren Ernährungsgewohnheiten oder seelische Belastungen sind molekularbiologisch gespeichert. Besonders wichtig sind zudem die Erlebnisse aus dem Mutterleib und dem ersten Jahr nach der Geburt. Gesundheit ist ein generationenübergreifendes Projekt.

Dr. rer. nat. Peter Spork ist laut Deutschlandfunk nicht nur „einer der führenden deutschen Wissenschaftsautoren“ sondern auch „der Mann, der die Epigenetik populär machte“. Er studierte Biologie, Anthropologie und Psychologie in Marburg und Hamburg und arbeitet seit 1991 als Wissenschaftsjournalist (Die Zeit, FAZ, SZ, NZZ, Tages-Anzeiger, Geo, bild der wissenschaft). Spork ist Autor mehrerer Sachbücher, die in neun Sprachen übersetzt wurden. Sein Bestseller *Der zweite Code* ist das erste populärwissenschaftliche Sachbuch über Epigenetik. In seinem aktuellen Buch *Gesundheit ist kein Zufall* schildert er, welche Auswirkungen die neuen Erkenntnisse für unseren Umgang mit uns selbst und unseren Kindern und Enkeln haben. Zudem ist Spork Autor und Herausgeber des Newsletter *Epigenetik*.

www.peter-spork.de | www.gesundheit-ist-kein-zufall.de | www.newsletter-epigenetik.de

POSTERS

Patrick Allard et al. Genetic requirement for the epigenetic heritability of environmental exposure effects

Marine Baptissart et al. Maternal overnutrition and metabolic syndrome susceptibility: a model of epigenetic programming

Jacques Barth et al. Transgenerational transmission of trauma : the tree genes study

Johannes Beckers et al. Epigenetic factors of inter-generational inheritance of obesity and diabetes

Eduard Casas et al. Transgenerational epigenetic inheritance of acquired expression in worms

Madan Chaturvedi et al. Differential expression of SWI/SNF chromatin remodeler subunits brahma and brahma-related gene during drug-induced liver injury and regeneration in mouse model

Celine Cosseau et al. Transgenerational immune protection in the pacific oyster *Crassostrea gigas*

Cemil Kerimoglu et al. RNA-dependent inter-generational inheritance of enhanced synaptic plasticity and cognition after environmental enrichment

Mohammad Faisal Jamal Khan et al. LINE-1 methylation in cleft lip tissues with early pregnancy exposures

Ichizo Kobayashi et al. Epigenome-based adaptive evolution in bacteria: Evidence from genome, methylome, transcriptome and phenotype analyses

Terence Pang et al. Environmental modulation of male offspring anxiety-related behaviours in a model of preconception paternal stress

Fábio Pértille et al. Epigenetic and transcriptional effects of unpredictable light conditions in the pineal glands of chickens

Frédérique Pitel et al. Transgenerational effects of modifications of the embryonic environment in quail

Ramya Potabattula et al. Paternal age effects on human sperm DNA methylation and transmission into the next generation; Intergenerational Epigenetic Inheritance

Martin Roszkowski et al. One sperm for all – a novel experimental strategy opens new horizons in epigenetic inheritance

Stefania Santangeli et al. Epigenetic effects of BPA across zebrafish generations

Fernanda Serpeloni et al. Multigenerational epigenetic effects of stress during pregnancy

Susanne Thümmeler et al. Research program '14-7' about the impact of the terrorist attack of Nice on July 14th, 2016, in children and adolescents: Epigenetic studies

Alexandra Weyrich et al. Epigenetic memory of heat acclimation

Chantal Wicky et al. Tissue-specific requirements of the LET-418/Mi2 chromatin remodeler during *C. elegans* development

Akihito Yasuoka et al. Transgenerational effect of ethanol induced metabolic stress and its alleviation by dietary polyphenol

SPONSORS



FONDATION LATSIS
Internationale

DHEST

Departement Gesundheitswissenschaften
und Technologie



FONDS NATIONAL SUISSE
SCHWEIZERISCHER NATIONALFONDS
FONDO NAZIONALE SVIZZERO
SWISS NATIONAL SCIENCE FOUNDATION



Organization

Isabelle Mansuy, UZH / ETH Zurich
Nicole Aregger, UZH Zurich
Silvia Schelbert, UZH / ETH Zurich

Co-organizers

Johannes Bohacek, ETH Zurich
Constance Ciaudo, ETH Zurich
Gerhard Schratt, ETH Zurich

Patrons

Frédéric Merkt, Latsis Foundation
Detlef Günther, ETH Zurich



www.latsis2017.ethz.ch