

International Workshop Assessing the Security Implications of Genome Editing Technology

11-13 October, 2017
Herrenhausen Palace • Hanover, Germany

WORKSHOP PROGRAM

WEDNESDAY, 11th OCTOBER

09.00 A.M. - 1:00 P.M. REGISTRATION

Satellite Event:

09.00 A.M. - 1:00 P.M. POLICY MINI-HACKATHON SATELLITE EVENT, GLOBAL YOUNG ACADEMY (Invitation Only)

12.30 P.M. LUNCH

01.30 P.M. WELCOME

Chair: Volker ter Meulen, InterAcademy Partnership

Wilhelm Krull, Volkswagen Foundation

Volker ter Meulen, InterAcademy Partnership

Thierry Courvoisier, European Academies Science Advisory Council

Diane Griffin, U.S. National Academies of Sciences, Engineering, and Medicine

Jörg Hacker, German National Academy of Sciences Leopoldina

02.00 P.M. KEYNOTE LECTURES: A NEW AGE OF BIOLOGY

Chair & Introduction: Indira Nath, All India Institute of Medical Sciences, New Delhi

Presentations (20 min each):

A New Age of Biology

Sir Venki Ramakrishnan, Royal Society

The Latest Advances in Genome Editing: Between Promise and Alarm

Robin Lovell-Badge, The Francis Crick Institute

The Importance of Public Engagement for Discussions about Emerging Technologies

Dominique Brossard, University of Wisconsin-Madison

Questions & Answers

03.30 P.M. COFFEE BREAK

04.00 P.M. **SESSION 1**
ADVANCES IN GENOME EDITING: PROMISE AND READINESS

Chair and Introduction: Bärbel Friedrich, Alfried Krupp Institute of Advanced Studies, Greifswald

Presentations (20 min each):

Genome Editing in Medicine
Duanqing Pei, Chinese Academy of Sciences

Genome Editing in Agriculture
Dan Voytas, University of Minnesota, St. Paul

Gene Drives: From Species Eradication to Species Preservation
Fred Gould, North Carolina State University

Genome Editing in Microbes
Lennart Randau, Max Planck Institute for Terrestrial Microbiology, Marburg

Questions & Answers

05.45 P.M. **SESSION 2**
ASSESSING THE SECURITY DIMENSIONS ASSOCIATED WITH SPECIFIC APPLICATIONS OF GENOME EDITING TECHNOLOGIES

Chair & Introduction: David Relman, Stanford University

Assessing the Security Implications of Emerging Technologies: What Do We Need to Know?
Piers Millett, Oxford University

Questions & Answers

Introduction to the Breakout Groups
David Relman, Stanford University

06:30 P.M. **APERITIF**

07:00 P.M. **DINNER**

THURSDAY, 12th OCTOBER

**09:00 A.M. SESSION 2
BREAKOUT DISCUSSIONS: ASSESSING THE SECURITY DIMENSIONS
ASSOCIATED WITH SPECIFIC APPLICATIONS OF GENOME EDITING**

Breakout Group 1: Potential Security Concerns Arising from Human Cell Editing Applications (Auditorium)

Chair: Anthony Perry, University of Bath

Speaker: Jonathan Moreno, University of Pennsylvania

Rapporteur: Johannes Fritsch, German Academy of Sciences Leopoldina

Breakout Group 2: Potential Security Concerns Arising from Applications in Agriculture (Seminar 2)

Chair: Fred Gould, North Carolina State University

Speakers: Joachim Schiemann, German Federal Research Centre for Cultivated Plants

Angelika Schnieke, Technical University of Munich

Rapporteur: Nina Hobbhahn, European Academies Science Advisory Council

Breakout Group 3: Potential Security Concerns Arising from Gene Drive Applications (Seminar 5)

Chair: Zachary Adelman, Texas A&M University

Speaker: Todd Kuiken, North Carolina State University

Rapporteur: Sarah Carter, Science Policy Consulting LLC

Breakout Group 4: Potential Security Concerns Arising from Microbial Applications (Seminar 6)

Chair: Iqbal Parker, University of Cape Town, Cape Town

Speaker: Bert Rima, Queen's University Belfast

Rapporteur: James Revill, University of Sussex

10.30 A.M. COFFEE BREAK

**11.00 A.M. SUMMARY OF SESSION 2
BREAKOUT GROUPS AND PLENARY DISCUSSION**

Chair: Diane Griffin, U.S. National Academies of Sciences, Engineering, and Medicine

Report Out from Human Cell Editing Group

Report Out from Agriculture Group

Report Out from Gene Drive Group

Report Out from Microbe Group

Discussion of Breakout Group Reports

12.30 P.M. LUNCH (Ceremony Hall)

**01.30 P.M. SESSION 3, Part I
STRATEGIES FOR ADDRESSING POTENTIAL SECURITY RISKS OF GENOME
EDITING**

Chair and Introduction: Pilar Ossorio, University of Wisconsin-Madison

Panels

01.35 P.M. Legal, Regulatory, and Policy Strategies for Genome Editing: General
Michele Garfinkel, EMBO
S.R.Rao, Ministry of Science & Technology, Government of India

- 02.00 P.M.** **Legal, Regulatory, and Policy Strategies: Security-Specific**
Daniel Feakes, Implementation Support Unit, Biological Weapons Convention
Catherine Rhodes, University of Cambridge
- 02.25 P.M.** **Norms of Responsible Behavior and Voluntary Guidelines**
Indira Nath, All India Institute of Medical Sciences, New Delhi
Ulrich Sieber, Max Planck Institutes for Foreign and International Criminal Law
- 03.00 P.M.** **BREAK**
- 03.30 P.M.** **SESSION 3, Part II**
STRATEGIES FOR ADDRESSING POTENTIAL SECURITY RISKS OF GENOME EDITING
- Scientific and Technical Strategies**
Ursula Jenal, Jenal & Partners
Owain Edwards, Commonwealth Scientific & Industrial Research Organisation
- 03.55 P.M..** **Discussion with Session 3 Speakers Followed by Questions & Answers**
- Introduction to the Breakout Groups**
Pilar Ossorio, University of Wisconsin-Madison
- 04.45 P.M.** **COFFEE BREAK**
- 05.15 P.M.** **SESSION 4**
BREAKOUT DISCUSSIONS: ADDRESSING AND MITIGATING POTENTIAL SECURITY RISKS ASSOCIATED WITH SPECIFIC APPLICATIONS OF GENOME EDITING
- Breakout Group 1: Human Cell Editing Applications** (Auditorium)
Chair: Duanqing Pei, Chinese Academy of Sciences
Speaker: Abhimanyu Veerakumarasivam, Sunway University
Rapporteur: Johannes Fritsch, German Academy of Sciences Leopoldina
- Breakout Group 2: Applications in Agriculture** (Seminar 2)
Chair: Sarah Hartley, University of Exeter
Speaker: Rene Custers, Vlaams Institute for Biotechnology
Rapporteur: Nina Hobbhahn, European Academies Science Advisory Council
- Breakout Group 3: Gene Drive Applications** (Seminar 5)
Chair: Elizabeth Heitman, University of Texas Southwestern Medical Center
Speaker: Ary Hoffman, University of Melbourne
Rapporteur: Sarah Carter, Science Policy Consulting LLC
- Breakout Group 4: Microbial Applications** (Seminar 6)
Chair: Herawati Sudoyo, Eijkman Institute for Molecular Biology
Speaker: Filippa Lentzos, Kings College London
Rapporteur: James Revill, University of Sussex
- 06.45 P.M.** **APERTIF AND POSTER SESSION**
- 07.30 P.M.** **DINNER**

FRIDAY, 13th OCTOBER**09.00 A.M. SUMMARY OF SESSION 4
BREAKOUT GROUPS AND PLENARY DISCUSSION**

Chair: Peter Mills, Nuffield Council

Report Out from Human Cell Editing Group
 Report Out from Agriculture Group
 Report Out from Gene Drive Group
 Report Out from Microbe Group

Report-Out from Policy Mini-Hackathon Satellite Event: Alexander Kagansky, University of Edinburgh

Discussion of Breakout Group Reports**10.30 A.M. COFFEE BREAK****11.00 A.M. SESSION 5
PUBLIC COMMUNICATION AND ENGAGEMENT ON POTENTIAL SECURITY
RISKS OF GENOME EDITING APPLICATIONS**

Chair & Introduction: Dietram Scheufele, University of Wisconsin-Madison

Commentaries (7 min each):

Science Journalism in a Changing World
 Volker Stollorz, Science Media Center Germany

The Science of Communicating Risks and Benefits: When, Why, and How?
 Dominique Brossard, University of Wisconsin-Madison

Public Engagement: Rationales, Methods and Intended Outcomes
 Jason Delborne, North Carolina State University

Lessons from Engaging Global Communities of Science
 Elizabeth Heitman, University of Texas Southwestern Medical Center

**Connecting with Publics in a World of Twitter, Blogs, and Online News
Environments**
 Reiner Korbmann, Wissenschaft Kommuniziert

Panel Discussion Followed by Questions & Answers**12.30 P.M. SESSION 6
THE WAY AHEAD**

Chair: Robin Lovell-Badge, The Francis Crick Institute

Bärbel Friedrich, Alfred Krupp Institute of Advanced Studies, Greifswald
 Diane Griffin, U.S. National Academies of Sciences, Engineering, and Medicine
 Piers Millett, Oxford University
 Peter Mills, Nuffield Council
 Indira Nath, All India Institute of Medical Sciences, New Delhi
 Dietram Scheufele, University of Wisconsin-Madison

Panel Discussion Followed by Questions & Answers**01.15 P.M. CLOSING REMARKS**

Volker ter Meulen, InterAcademy Partnership

01.30 P.M. END OF WORKSHOP / REFRESHMENTS