

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

**Developing a Long-Term Strategy
for Low-Dose Radiation Research in the United States**

PUBLIC MEETING #7 (Virtual)
January 24-25, 2022, All times are ET

DRAFT PUBLIC AGENDA

ZOOM CONNECTION for **OPEN** SESSIONS on BOTH DAYS

<https://nasem.zoom.us/j/92537270375?pwd=T1RScDZxUGx0NjZjdjMyVXlmS2t1dz09>

Password: **216369**

Meeting ID: **925 3727 0375**

Also in the agenda:

Speaker Biographies
Statement of Task

Day 1: January 24, 2022

PUBLIC SESSION

- | | |
|--------------------------|--|
| 2:00 PM – 2:10 PM | Welcome and Open Public Session
<i>Joe Gray, Committee Chair</i> |
| 2:10 PM – 2:30 PM | Opportunities in Low-Dose Radiation Research
<i>Andrew Wyrobek and Antoine Snijders, Lawrence Berkeley National Laboratory</i> <ul style="list-style-type: none">• Discussion of recent paper• Low-dose radiation effects on the brain and behavior• Opportunities to investigate the role of host genetic variation in low-dose radiation research. |
| 2:30 PM – 2:40 PM | Q+A and Discussion |
| 2:40 PM – 2:50 PM | Radiation Biology: A Response to the American Innovation and Competitiveness Act
<i>Kartik Sheth, White House Office of Science and Technology Policy</i> <ul style="list-style-type: none">• Review of the recent report |

- Views on coordination with this committee’s strategic research agenda

2:50 PM – 3:05 PM

Q+A and Discussion

3:05 PM – 3:45 PM

Challenges and Opportunities for dosimetry in low-dose radiation research

[Derek Jokisch](#), *Francis Marion University and Oak Ridge National Laboratory (20 min)*

[John Klumpp](#), *Los Alamos National Laboratory (20 min)*

- Dosimetric methods for internal and external exposures
- Biokinetics
- Radiation matter interactions
- Addressing uncertainties in population exposures

3:45 PM – 4:05 PM

Q+A and Discussion

4:05 PM – 4:20 PM

BREAK

4:20 PM – 4:50 PM

Updates and Final Remarks from DOE on the Study Task

[Todd Anderson](#), *DOE-Office of Science*

- Activities, if any, within BER to prepare for the low-dose radiation program
- Available funds currently and plans for funding projects and with what mechanisms
- Description of funding mechanisms to support research at national laboratories and universities and internationally; project review and selection process. Please direct the committee to public links/documents when available
- Progress with advancing low-dose research through projects currently funded by the low-dose program (e.g., RadBio-AI); plan for continuing support for these projects
- Comments/views on the 80 or so presentations and public comments that the committee received during this study
- Views on how this committee’s report findings could be orchestrated with the OSTP/NSTC report findings
- Any other issues you would like to raise with the committee

4:50 PM – 5:20 PM

Q+A and Discussion

5:20 PM – 5:30 PM

BREAK

5:30 PM – 6:05 PM

Current Research and Future Directions at the Radiation Effects Research Foundation (RERF), Japan

[Bob Ullrich](#), *RERF*

- Brief overview of RERF mission, history, funding support
- Status of current cohorts. Please include mean doses received, number of individuals alive and followed.
- Brief overview of recent findings including update on cancer estimates; cataracts; in utero studies, and untoward

pregnancy outcomes; emphasis on how these studies inform risks at low doses

- Plans for updating dosimetry
 - Are there plans to implement a dose-error correction?
 - Are there limitations to current dose-error correction, for example doses below which errors are not accounted for?
- Stakeholder involvement and communications
- Strategic planning within RERF and future directions
 - Implementation timeline
 - Current status and plans for data and biosample sharing
 - Plans for collaborative work and genomic analyses
- Views on how RERF can coordinate with the low-dose radiation program
 - Views on research priorities for the low-dose program
 - Views on essential elements for the program

6:05 PM- 6:30 PM Q+A and Discussion

6:30 PM – 6:45 PM Opportunity for Public Comment

6:45 PM Adjourn Open Session

Day 2: January 25, 2022

<h3>PUBLIC SESSION</h3>

11:00 AM – 11:30 AM Opportunity for Public Comment

[Speaker Biographies](#)

Dr. [Todd Anderson](#) serves as the Director of the Biological Systems Science Division within DOE's Office of Biological and Environmental Research (BER). The division manages basic science programs addressing the fundamental biology of plants and microbes of relevance to DOE's bioenergy and environmental missions. The portfolio includes the Genomic Science Program, the DOE Bioenergy Research Centers, the DOE Joint Genome Institute, the DOE Systems Biology Knowledgebase, the National Microbiome Data Collaborative, Bioimaging Science Program and, capabilities at the DOE Synchrotron Light and Neutron sources for Structural Biology. Dr. Anderson holds a bachelor's degree in chemistry from the University of Virginia, a master's degree in environmental engineering from the Johns Hopkins University and a Ph.D. in environmental engineering from the University of Massachusetts.

[Derek W. Jokisch](#) is Professor of Physics and Chair of the Department of Physics and Engineering at Francis Marion University in Florence, South Carolina where he has been on faculty since 1999. In 2014 he joined the Center for Radiation Protection Knowledge (CRPK) at Oak Ridge National Laboratory via a Joint Faculty Appointment and currently serves as Director of the CRPK. Jokisch earned his bachelor's degree in nuclear engineering from the University of

Illinois and his master's and doctoral degrees in nuclear engineering sciences (health physics) from the University of Florida. His graduate studies were supported by a Department of Energy Nuclear Engineering/Health Physics Fellowship. He has been a member of dosimetry task groups for the International Commission on Radiological Protection (ICRP) since 2009 and a member of ICRP Committee 2 since 2017. In 2021 he was elected to the National Council on Radiation Protection and Measurements (NCRP) and serves as Chair of NCRP Scientific Committee 6-13 on Methods and Models for Estimating Organ Doses from Intakes of Radium. Since 2016, he has served on the US Scientific Review Group for the Department of Energy's Russian Health Studies Program. Jokisch is a past recipient of the Elda Anderson Award from the Health Physics Society and the J. Lorin Mason Distinguished Professor Award at Francis Marion University.

[John Klumpp](#) is the Program Lead for the Internal Dosimetry Program at Los Alamos National Laboratory. He specializes in the biokinetics and health effects of incorporated plutonium and americium. He received his PhD in Radiological Protection from Colorado State University, his M.S. in Medical Physics from the University of Pennsylvania, and his B.S. in Physics from Bates College. His research interests include, but are not limited to, counting measurement statistics, plutonium biokinetics, and medical management of radionuclide intakes via medication, surgical excision, and mental health counselling.

Dr. [Kartik Sheth](#) is the Assistant Director for Research Infrastructures and Science Equity at the White House Office of Science & Technology Policy in the Executive Office of the President. Dr. Sheth develops strategies and policy for innovation in the S+ T enterprise. His portfolio encompasses advanced manufacturing, advanced materials and critical minerals, physical sciences, and technology transfer. He is responsible for providing subject matter expertise to the Administration on policy issues related to astronomy and astrophysics, and human and physical infrastructures for science, technology, and engineering. Before coming to the White House, Dr. Sheth was a Program Scientist in the Science Mission Directorate at NASA Headquarters. He oversaw the Spitzer Space Telescope, the James Webb Space Telescope, the Origins Space Telescope Mission Concept Study, the Low Energy Astrophysics Research and Analysis portfolio, the NASA Hubble Fellowship Program, and the Cosmic Origins Program. He has also worked in the Earth Science Division in the Applied Science Program where he managed a cooperative grant with a non-profit group of economists who seek to build a framework for the value of information and build a consortium of social scientists and scientists to do impact assessments. He also led NASA's engagement with UN Habitat and helped with NASA's role towards achieving UN's Sustainability Development Goals.

Dr. [Antoine M. Snijders](#) received his master's degree in biomedical sciences from VU University in Amsterdam (Netherlands) in 1999 and a doctorate degree from Utrecht University in the Netherlands in 2004. He completed a postdoctoral research fellowship at the University of California, San Francisco Cancer Research Institute in 2005-08. He is currently a Senior Scientist in the Biological Systems and Engineering Division at Lawrence Berkeley National Laboratory where he is the Chair of the Department of Bioengineering and Biomedical Sciences. Dr Snijders's research goals are to understand the complex interactions among genetic background, environmental exposures and the microbiome in determining disease risk. He pursues studies to gain insight into these interactions using mouse population-based cohorts and human epidemiologic studies. Precision medicine is an emerging approach for disease treatment and prevention that considers individual variability in environment, lifestyle and genes for each person. Genetic susceptibility is a major component that contributes to the variability in disease susceptibility. Thus, identifying the genes involved in susceptibility to disease risk may have potential utility in developing novel personalized medicines, lead to greater understanding of the biological pathways involved in disease development, and elucidate how environmental

factors exert their effects in combination with genetic variants and the gut microbiome. This comprehensive systems biology approach will likely identify specific genes or pathways and microbial clades that are differentially controlled between individuals and contribute to human variation in susceptibility to environment factor-induced disease. His lab exploits the power of mouse genetics using Collaborative Cross (CC) mice, together with human cohort studies to determine the influence of individual variations in disease susceptibility.

Dr. [Robert Ullrich](#) is the Chief of Research, Vice Chairman, and Executive Director at the Radiation Effects Research Foundation (RERF) in Hiroshima, Japan. Dr. Ullrich initially joined RERF as its Associate Chief of Research in November 2013. Before joining RERF, Dr. Ullrich was the John Sealy Distinguished Chair in Cancer Biology, Director of the Sealy Center for Cancer Biology, and Interim Director of the Cancer Center at the University of Texas Medical Branch in Galveston, Texas. Prior to that he was the Barbara Cox Anthony Distinguished Chair in Oncology at Colorado State University and Director of the Colorado State component of the University of Colorado Consortium Comprehensive Cancer Center. He is recognized internationally for his research on mechanisms and risks of cancer following exposure to ionizing radiation and for his scientific leadership of laboratory, academic, and medical programs. Dr. Ullrich received the Radiation Research Society's Failla Award in 2012 for outstanding research contributions in radiation science.

[Andrew J. Wyrobek](#) is a Senior Staff Scientist (Genetics and Biophysics) in Biological Systems and Engineering Division at the Lawrence Berkeley National Laboratory, University of California. His research uses multi-omics, bioinformatics, histochemistry and imaging to elucidate tissue-specific mechanisms that determine individual susceptibility for cancer and susceptibility for behavior/cognitive deficits after low-dose ionizing radiation and other environmental stressors. His current research focusses on molecular markers and CNS mechanisms that determine individual differences in risks for behavioral and cognitive deficits after exposure to space radiation, and to model the variation in performance across behavioral domains from simulated space radiation for NASA. Dr. Wyrobek received his BS in Physics from University of Notre Dame (1970) and a PhD in Medical Biophysics from University of Toronto Ontario Ontario Cancer Institute (1975). He has served as Division Chair of Health Effects Genetics at the Lawrence Livermore National Laboratory, Departmental Chair of Radiation Biology and has served as President of the US Environmental Mutagen and Genomics Society.

Statement of Task

The National Academies of Sciences, Engineering, and Medicine will perform a study and provide a report with findings and recommendations on the current status and development of a long-term strategy for low-dose radiation research in the United States. Specifically, the objectives of the study will be to:

1. Define the health and safety issues that need to be guided by an improved understanding of low dose and low dose rate radiation health effects.
2. Identify current scientific challenges for understanding low dose and low dose rate radiation health effects.
3. Assess the status of current low dose radiation research in the United States and internationally.
4. Recommend a long-term strategic and prioritized research agenda to
 - address scientific research goals for overcoming the identified scientific challenges in coordination with other research efforts
 - support education and outreach activities to disseminate information and promote public understanding of low-dose radiation.
5. Define the essential components of the research program that would address this research agenda within the universities and National Laboratories.
6. Address coordination between federal agencies (including the National Institutes of Health, the National Science Foundation, National Aeronautics and Space Administration, and different DOE offices) and with international efforts to achieve objectives.
7. Identify and, to the extent possible, quantify, potential monetary and health-related impacts to Federal agencies, the general public, industry, research communities, and other users of information produced by such research program.

The National Academies will prepare a report with findings and recommendations that addresses the objectives above.