



## Agenda

### Day 1 — Thursday, September 13

**8:00 a.m. Registration**

**8:30 a.m. Session 1: Natural product translational research: Setting the stage**

- Joseph M. Betz, Office of Dietary Supplements (ODS), National Institutes of Health (NIH)
- D. Craig Hopp, National Center for Complementary and Integrative Health (NCCIH), NIH
- Barbara C. Sorkin, ODS, NIH
- Adam J. Kuszak, ODS, NIH
- Steven J. Casper, Center for Food Safety and Applied Nutrition (CFSAN), Food and Drug Administration (FDA)

**9:00 a.m. Session 2: The natural product intervention: Translational relevance of assays for bioactives**

**Session chair: Barbara C. Sorkin, ODS, NIH**

- Enhancing translational potential of in vitro studies: Organoid cultures — Hervé Tiriac, Cold Spring Harbor Laboratory
- The evolution of human experimental models for drug discovery/development and precision medicine: Different model types, reproducibility, applications, and future impact — D. Lansing Taylor, University of Pittsburgh
- Translatability of assays: In vitro-in vivo extrapolation — Nisha S. Sipes, National Institute of Environmental Health Sciences (NIEHS), NIH
- Perils and pitfalls of in vitro assays: What could possibly go wrong? — Michael A. Walter, University of Minnesota

**10:30 a.m. Break (15 minutes)**

**10:45 a.m. Session 3: The natural product intervention: Determining the critical characteristics for reproducibility**

**Session chair: Craig Hopp, NCCIH**

- Devil's in the details (of natural product chemistry): (Stereo-)isomers can make a difference — Ken Setchell, Cincinnati Children's Hospital Medical Center
- What is the role of host metabolism in generating bioactivity? Examples of food- and host-related factors affecting polyphenol metabolite profiles — Mario D. Ferruzzi, North Carolina State University
- Healthspan pharmacology: Botanical extract mechanisms of action and animal models of aging — Mahtab Jafari, University of California, Irvine
- Generating strong causal, molecular mechanism hypotheses for complex natural products — John B. MacMillan, University of California, Santa Cruz

**12:15 p.m. Panel 1: Natural product characterization and critical data for specifications**

**Panel chair: Guido Pauli, University of Illinois at Chicago (UIC)**

- What data are most critical for the selection of the products and controls to be tested?
- What considerations in product and control characterization and specification are most critical for clinical relevance?
- What role should current typical usage play in these considerations?
- What are optimal approaches to assessing, controlling, or reporting other variables that may modulate bioactivity?
- What should be done to optimize knowledge gained in translation to humans?

**12:50 p.m. Lunch (45 minutes)**

**1:35 p.m. Session 4: Optimizing the foundations for translational natural product research: Preclinical models**

**Session Chair: Harold Seifried, National Cancer Institute (NCI), NIH**

- Mice are not miniature humans: Approaches to enhance translational potential — Jeffrey Paul, Drexel College of Medicine
- Considerations regarding the use of mice in preclinical studies — Jacqueline M. Stephens, Louisiana State University (LSU), Pennington Biomedical Research Center
- The call of the wild is lost in translation: animals, models, science, and what we don't know — Kathleen Pritchett-Corning, Harvard University

**3:05 p.m. Break (15 minutes)**

**3:20 p.m. Session 5: Lost in translation: Important individual (and other) differences**

**Session Chair: Giovanna Zappalà, National Institute on Aging (NIA), NIH**

- Applying quantitative modeling and simulation to improve natural product clinical trial design — Sara Quinney, Indiana University
- Precision nutrition and polyunsaturated fatty acids: A case for personalized supplementation approaches for the prevention and management of human diseases — Floyd "Ski" Chilton, Wake Forest University
- The microbiome, individual differences, and xenobiotic processing — Frederic Bushman, University of Pennsylvania
- Translation from observational studies to clinical trials — Marco Pahor, University of Florida, Gainesville

**4:30 p.m. Panel 2: What are critical supporting data for a natural product clinical trial?**

**Panel chair: Freddie Ann Hoffman, Heterogeneity, LLC**

- For non-human *in vivo* models, what are the most critical factors to increase understanding of the effects of natural products on human health?
- Assuming adequate safety for use in humans, what data are sufficient to optimally design and ethically justify a clinical trial? What types of data are most critical versus less likely to support translation?

**5:15 p.m. Adjourn**



## Agenda

### Day 2 — Friday, September 14

**8:30 a.m. Session 6: Optimizing the foundations for translational natural product research: Assessing prior research**

**Session chair: Laura Lee Johnson, FDA**

- How much of a difference? Deciding on effect size target for natural product clinical trials — Bruce Barrett, University of Wisconsin, Madison
- Evaluating the reliability of published research — Daniel Lakens, Eindhoven University of Technology, Netherlands
- Data requirements for developing clinical trials of natural products — Mairead Kiely, University College Cork

**9:45 a.m. Break (15 minutes)**

**10:00 a.m. Session 7: Some strategies for optimizing natural product translational research design and yield**

**Session chair: Greg Bloss, National Institute on Alcohol Abuse and Alcoholism (NIAAA), NIH**

- Design considerations when planning clinical trials — Chris Coffey, University of Iowa
- Value of information analysis as a guide for research investment — David O. Meltzer, UIC

**11:00 a.m. Final panel discussion: Good practices in rigor and prioritization for translational natural product research**

**Panel chair: Naomi Fukagawa, Agricultural Research Service, U.S. Department of Agriculture**

- What are the most critical considerations in assessing the rigor of data used to support a natural product clinical trial?
- What are good/best approaches for assessing: (a) what additional data will most increase the information yield of a planned clinical trial? (b) for assessing whether a clinical trial is the best next step? (c) for designing a natural product clinical trial? (d) for estimating the anticipated population health impact of a given natural product clinical trial?
- What are optimal initial study design(s) to address the impact of natural products on human health?
- What other factors are critical for selecting which clinical studies to do first?
- What should be done to optimize the knowledge gained in translation to humans?
- What additional critical issues for reproducibility of foundational data and natural product clinical trials should be better addressed (not previously addressed in the workshop or by existing guidance)?
- What are additional critical issues to enhance the human health relevance of preclinical and early phase clinical research (not otherwise addressed)?

**12:00 noon Adjourn**