

# Diet, DNA Methylation Processes and Health

## Agenda

**Monday, August 6, 2001**

### Welcome and Opening Remarks Session

**8:00 to 8:30 AM**

**Ruth Kirschstein**, M.D., Principle Deputy Director, National Institutes of Health

**Bernard Schwetz**, D.V.M., Ph.D., Acting Principal Deputy Commissioner, Food and Drug Administration

**Richard Allison**, Ph.D., Executive Officer, American Society for Nutritional Sciences

**Richard Black**, Ph.D., Executive Director, International Life Sciences Institute of North America

### Overview Topics

Moderator: **Lionel Poirier**, National Center for Toxicological Research, Food and Drug Administration, Jefferson, AR.

**8:30 to 8:55 AM** DNA methylation in mammals. **Peter A. Jones**, Norris Comprehensive Cancer Center, University of Southern California, Los Angeles, CA.

**8:55 to 9:20 AM** Metabolic aspects of methyl group formation from one-carbon units. **Barry Shane**, Department of Nutritional Sciences and Toxicology, University of California, Berkeley, CA.

**9:20 to 9:45 AM** Diet and methyl donors: interactions between dietary folate, methionine, and choline. **Steven Zeisel**, School of Public Health and School of Medicine, University of North Carolina at Chapel Hill, Chapel Hill, NC.

**9:45 to 10:10 AM** Impact of nutrition, genetics, and chemical toxicity on aberrant DNA methylation. **Lionel Poirier**, National Center for Toxicological Research, Food and Drug Administration, Jefferson, AR.

**10:10 to 10:30 AM Discussion**

**10:30 to 10:50 AM Morning Break**

### Dietary Methyl Donor Insufficiency and Human Disease Risk

Moderator: **John Milner**, Division of Cancer Prevention, National Cancer Institute, Rockville, MD.

**10:50 to 11:15 AM** Cellular vitamins, DNA methylation and cancer risk. **Gary L. Johanning and Chandrika J. Piyathilake**, Department of Nutrition Sciences, University of Alabama at Birmingham, Birmingham, AL.

**11:15 to 11:40 AM** Nutritional and genetic inefficiencies in one-carbon metabolism and cervical cancer risk. **Regina Ziegler**, Division of Cancer Epidemiology and Biostatistics, National Cancer Institute, Rockville, MD.

**11:40 to 12:05 PM** Interactions between folate-B12-alcohol-methioine and cancer risk. **Edward Giovannucci**, Channing Laboratory, Department of Medicine, Harvard Medical School, and Department of Nutritional Epidemiology, Harvard School of Public Health, Boston, MA.

**12:05 to 12:30 PM** Folic acid supplementation and prevention of neural tube defects. **Nancy S. Green**, March of Dimes, White Plains, NY.

**12:30 to 12:50 PM Discussion**

**12:50 to 1:50 PM Lunch Break**

### **Methyl Metabolism and Biochemistry**

Moderator: **S. Jill James**, National Center for Toxicological Research, Food and Drug Administration, Jefferson, AR.

**1:50 to 2:15 PM** Elevated homocysteine levels and DNA hypomethylation: an epigenetic mechanism for homocysteine-related pathology. **S. Jill James**, National Center for Toxicological Research, Food and Drug Administration, Jefferson, AR.

**2:15 to 2:40 PM** Metabolic interaction of alcohol and folate. **Charles Halsted**, Division of Clinical Nutrition and Metabolism, University of California School of Medicine, Davis, CA.

**2:40 to 3:05 PM** Vitamin B12, folate, and methylation reactions in the brain. **Ralph Green**, Department of Medical Pathology, University of California, Davis, CA.

**3:05 to 3:25 PM Afternoon Break**

**3:25 to 3:50 PM** Abnormal methyl metabolism in pancreatic toxicity and diabetes. **Daniel Longnecker**, Department of Pathology, Dartmouth Medical School, Lebanon, NH.

**3:50 to 4:15 PM** The suppression of methionine adenosyltransferase IA in hepatotoxicity. **José M. Mato**, Unidad de Hepatología y Terapia Genica, Departamento de Medicina Interna, Facultad de Medicina, Universidad de Navarra, Pamplona, Spain.

**4:15 to 4:40 PM** Gene-nutrient interactions and DNA methylation. **Jacob Selhub**, Jean Mayer U.S. Department of Agriculture Human Nutrition Research Center on Aging at Tufts University, Boston, MA.

**4:40 to 5:00 PM Discussion**

**Tuesday, August 7, 2001**

**Mechanisms and Consequences of (Aberrant) DNA Methylation in Physiological Processes**

Moderator: **John Potter**, Fred Hutchinson Cancer Research Center, Seattle, WA.

**9:00 to 9:25 AM** DNA methylation and imprinting in development. **Benjamin Tycko**, Institute of Cancer Genetics, Columbia University, New York, NY.

**9:25 to 9:50 AM** Epigenetic variation and human disease. **Jean-Pierre Issa**, Leukemia Department, University of Texas at M.D. Anderson Cancer Center, Houston, TX.

**9:50 to 10:15 AM** Maternal dietary methyl supplements increase DNA methylation and methylation-dependent phenotype in mammalian offspring. **Craig Cooney**, Department of Biochemistry and Molecular Biology, University of Arkansas for Medical Sciences, Little Rock, AR.

**10:15 to 10:40 AM** Role of DNA methylation in the regulation of cell function: cancer, autoimmunity, and aging. **Bruce Richardson**, Internal Medicine, University of Michigan at Ann Arbor, Ann Arbor, MI.

**10:40 to 11:00 AM Morning Break**

**11:00 to 11:25 AM** DNA methylation and atherosclerosis. **Pascal J. Goldschmidt**, Division of Cardiology, Duke University Medical Center, Durham, NC.

**11:25 to 11:50 AM** Methyl supply and methyl metabolizing enzymes and colon cancer risk. **John Potter**, Fred Hutchinson Cancer Research Center, Seattle, WA.

**11:50 to 12:15 PM** Folate deficiency and colon carcinogenesis: hypomethylation of p53, DNA strand breaks and DNA repair. **Joel Mason**, Vitamin and Carcinogenesis Program, Jean Mayer U.S. Department of Agriculture Human Nutrition Research Center on Aging at Tufts University, Boston, MA.

**12:15 to 1:15 PM Lunch Break**

**Mechanisms and Consequences of (Aberrant) DNA Methylation in Physiological Processes, continued** Moderator: **John Potter**

**1:15 to 1:40 PM** Effects of phytoestrogens on DNA methylation in mice and in the TRAMP mouse prostate cancer model. **Dennis Lubahn**, Departments of Biochemistry and Child Health, University of Missouri-Columbia, Columbia, MO.

**1:40 to 2:05 PM** DNA hypomethylation: the ICF syndrome, immunodeficiency, DNA rearrangements, and cancer. **Melanie Ehrlich**, Human Genetics Program, Tulane Cancer Center at Tulane Medical School, New Orleans, LA.

**2:05 to 2:25 PM Discussion**

**2:25 to 2:45 PM Afternoon Break**

**Research Applications in DNA Methylation**

Moderator: **Peter Laird**, Keck School of Medicine, University of Southern California, Los Angeles, CA.

**2:45 to 3:10 PM** Current methodologies in DNA methylation analysis. **Peter Laird**, Keck School of Medicine, University of Southern California, Los Angeles, CA.

**3:10 to 3:35 PM** Dissecting complex epigenetic alterations in cancer using CpG island microarray. **Tim Huang**, Department of Pathology and Anatomical Sciences, Ellis Fischel Cancer Center, University of Missouri-Columbia, Columbia, MO.

**3:35 to 4:00 PM** A public DNA methylation database. **Christoph Grunau**, Institut de Genetique humaine, Montpellier, France.

**4:00 to 4:25 PM** Efficient detection of DNA methylation patterns. **Alexander Olek**, Epigenomics AG, Berlin, Germany.

**4:25 to 4:45 PM Discussion**

## Wednesday, August 8, 2001

### 8:00 to 8:10 AM In Tribute to Dr. Alan Wolffe

#### Cell and Molecular Biology of DNA Methylation

Moderator: **Stephen Baylin**, The Johns Hopkins University School of Medicine, Baltimore, MD.

**8:10 to 8:35 AM** Promoter-region methylation and gene silencing in cancer. **Stephen Baylin**, Oncology Center, The Johns Hopkins University School of Medicine, Baltimore, MD.

**8:35 to 9:00 AM** Impact of folate deficiency on DNA stability. **Susan J. Duthie**, Rowett Research Institute, Aberdeen, Scotland, UK.

**9:00 to 9:25 AM** DNA methylation, histone deacetylation, and gene expression. **Fyodor Urnov**, Sangamo BioSciences, Richmond, CA.

**9:25 to 9:50 AM** Folate transport knockout mice, DNA methylation and congenital defects. **Richard Finnell**, Institute of Biosciences and Technology, The Texas A&M University System Health Science Center, Houston, TX.

### 9:50 to 10:10 AM Morning Break

**10:10 to 10:35 AM** Functions of mammalian DNA methyltransferases: lessons learned from mouse knockout models. **Masaki Okano**, Cardiovascular Research Center, Massachusetts General Hospital-East, Department of Medicine, Harvard Medical School, Charlestown, MA.

**10:35 to 11:00 AM** DNA methylation and methyl-binding proteins in development and gene regulation. **Laurie Jackson-Grusby**, Whitehead Institute for Biomedical Research, Cambridge, MA.

### 11:00 to 11:20 AM Discussion

#### Public Health Issues

Moderator: **Elizabeth Yetley**, Center for Food Safety and Applied Nutrition, Food and Drug Administration, Washington, DC.

**11:20 to 11:45 AM** Folic acid fortification, folate status and plasma homocysteine. **Jeanne Rader**, Center for Food Safety and Applied Nutrition, Food and Drug Administration, Washington, DC.

**11:45 to 12:10 PM** Biomarker as a competing technology in health services. **Sudhir Srivastava**, Division of Cancer Prevention, National Cancer Institute, Rockville, MD.

### 12:10 to 1:10 PM Lunch Break

#### Public Health Issues, continued

Moderator: **Elizabeth Yetley**

**1:10 to 1:35 PM** Bringing individuality to public health recommendations. **Patrick Stover**, Division of Nutritional Biochemistry, Cornell University, Ithaca, NY.

**1:35 PM to 2:00 PM** Communicating public health recommendations for consumers. **Sylvia Rowe**, International Food Information Council, Washington, DC.

### 2:00 PM to 2:20 PM Discussion

**Panel Discussion**

Moderator: **Sharon Ross**, Division of Cancer Prevention, National Cancer Institute, Rockville, MD.

**2:20 to 3:20 PM All Session Moderators.** Priorities for Future Research: Moderators will summarize each speaker's recommendation for future research and a discussion with all participants about research priorities will follow.

**3:20 PM Adjournment**