

National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)

## **Neuroimaging in Obesity Research**

Natcher Conference Center, Building 45, National Institutes of Health (NIH)

October 27 - 28, 2008

### **Agenda**

#### **Monday, October 27, 2008**

**7:30 a.m. – 9:00 a.m. Registration and Coffee**

**9:00 a.m. – 9:15 a.m. Welcome and Introduction**

Dr. Nora Volkow, Director, National Institute on Drug Abuse (NIDA),  
Deputy Director, NIDDK

#### ***Session I. Obesity—What Are the Big Questions Concerning the Role of the Brain?***

Moderator: Dr. Angelo Del Parigi, Pfizer, Inc.

**9:15 a.m. – 9:45 a.m. The Brain and Obesity: The Clinical Picture**

Dr. Rudolph Leibel, Columbia University

*An overview of the clinical picture with emphasis on the brain in obesity; neural complications of obesity, including cognitive ability; monogenic obesities; response to therapy, including intentional weight loss, bariatric surgery; response to antipsychotics; other clinical issues.*

**9:45 a.m. – 10:15 a.m. Behavior and the Brain in Obesity**

Dr. Adam Drewnowski, University of Washington

*An overview of the behavior phenotypes associated with obesity: decision-making, impulsivity, endophenotypes within hedonics, satiety and hunger, craving, eating disorders, bingeing, etc.*

**10:15 a.m. – 10:45 a.m. CNS Pathways Regulating Body Weight and Glucose Homeostasis**

Dr. Joel Elmquist, University of Texas Southwestern Medical Center

*An overview of the neural and molecular pathways associated with energy balance and eating; hypothalamic neurotransmitters; leptin, insulin, ghrelin, dopamine, etc.; food intake, energy balance and metabolism; progress in imaging in animal models.*

**10:45 a.m. – 11:15 a.m. Panel Discussion**  
Moderator: Dr. Angelo Del Parigi, Pfizer, Inc.

- *What do we want to learn about the brain in obesity?*
- *What are imageable biomarkers of obesity in the brain?*
- *What studies can best be done in animal models and what should be studied in people?*

**11:15 a.m. – 11:40 a.m. Break**

***Session II. Functional Neuroimaging—What Can It Be Used For?***

Moderator: Dr. Samuel McClure, Stanford University

*These introductory technical talks will convey useful and important information regarding exactly what functional imaging can measure and what it cannot (discriminating the imageable markers of brain function from brain function itself, etc.); how studies should be designed; and important points to consider regarding data analysis and data interpretation; etc.*

**11:40 a.m. – 12:10 p.m. Magnetic Resonance Methods for Functional and Anatomical Neuroimaging**  
Dr. Peter Bandettini, National Institute of Mental Health (NIMH)

**12:10 p.m. – 12:20 p.m. MEG Methods for Functional Neuroimaging**  
Dr. David Poeppel, University of Maryland

**12:20 p.m. – 12:55 p.m. PET Methods for Functional Neuroimaging and Data Analysis**  
Dr. Peter Herscovitch, NIH

**12:55 p.m. – 1:25 p.m. A Frank Discussion of Study Design**  
Dr. Russell Poldrack, University of California at Los Angeles

*How does one design and validate a new study? What extant paradigms are most useful for studies of obesity? “State” measures (metabolism) versus activation paradigms (block design, natural behaviors, etc.).*

**1:25 p.m. – 2:30 p.m. Lunch (on your own)**

**2:30 p.m. – 2:50 p.m. Adolescent Brain Development and Risk for Psychopathology**  
Dr. B.J. Casey, Cornell University

*Children have different hardware and study design needs due to size, attention span, need for noninvasive studies, etc. Data interpretation may be complicated by developmental stage.*

**2:50 p.m. – 3:15 p.m.**      **Special Considerations for Analysis of fMRI Data**  
Dr. Robert Cox, NIMH

*Common methods of data analysis for neuroimaging studies; pitfalls and best practices; what can be known from functional neuroimaging studies; novel or experimental data analysis methods.*

**3:15 p.m. – 3:30 p.m.**      **Data Interpretation in the Real World**  
Dr. David Poeppel, University of Maryland

*Considerations when interpreting neuroimaging data to inform our understanding of brain function.*

**3:30 p.m. – 4:15 p.m.**      **Panel Discussion**  
Moderator: Dr. Samuel McClure, Stanford University

*Can we design robust, interpretable neuroimaging studies that can answer the important questions surrounding brain function in the following areas?*

- *Energy balance*
- *Eating behavior and eating disorders*
- *Predisposition to and consequences of obesity*

**4:15 p.m. – 4:45 p.m.**      **Break**

**Session III. Lessons from Neuroimaging—Brain Function in Health and Disease**  
Moderator: Dr. Peter Bandettini, NIMH

**4:45 p.m. – 5:10 p.m.**      **Neuroimaging of Intrinsic Connectivity**  
Dr. Michael Greicius, Stanford University

**5:10 p.m. – 5:35 p.m.**      **Neuroimaging of Drug Abuse**  
Dr. Elliot Stein, NIDA

**5:35 p.m. – 6:05 p.m.**      **Neuroeconomics and Decision-Making**  
Dr. P. Read Montague, Baylor College of Medicine

**6:05 p.m. – 6:35 p.m.**      **Neuroimaging of Genetic Polymorphisms**  
Dr. Daniel Weinberger, NIMH

**6:35 p.m. – 7:00 p.m.**      **Panel Discussion**  
Moderator: Dr. Peter Bandettini, NIMH

- *What lessons can we take from other fields for studies of obesity?*

**7:00 p.m.**      **Adjourn**

**Tuesday, October 28, 2008**

**7:30 a.m. – 8:30 a.m. Registration and Coffee**

***Session IV. Neuroimaging: Obesity and Energy Balance***

Moderator: Dr. Joel Elmquist, University of Texas Southwestern Medical Center at Dallas

*This session reports on neuroimaging studies of energy balance in people and animal models.*

**8:30 a.m. – 8:50 a.m. The Senses and Emotion—Taste and Smell**  
Dr. Dana Small, The John B. Pierce Laboratory and Yale University

**8:50 a.m. – 9:10 a.m. Hypothalamic Response to Hormones and Nutrient Ingestion**  
Dr. Jeroen van der Grond, Leiden University Medical Center

**9:10 a.m. – 9:30 a.m. PYY and Hypothalamus to Corticolimbic Switching**  
Dr. Rachel Batterham, University College London

**9:30 a.m. – 9:50 a.m. Leptin, Hypothalamus and Cortical Regulation**  
Dr. Joy Hirsch, Columbia University

**9:50 a.m. – 10:30 a.m. Panel Discussion**  
Moderator: Dr. Joel Elmquist, University of Texas Southwestern Medical Center at Dallas

- *What is needed in terms of biomarkers for energy balance in the brain?*
- *What questions can be answered with neuroimaging?*
- *How can information from neuroimaging experiments be interpreted?*
- *How can neuroimaging inform therapy, etc.?*
- *How can this information be used to design new informative experiments?*

**10:30 a.m. – 10:50 a.m. Break**

***Session V. Neuroimaging: Obesity and Eating Behavior***

Moderator: Dr. Cary Savage, University of Kansas Medical Center

*This session reports on neuroimaging studies of obesity and eating behavior and related fields in people and animal models.*

**10:50 a.m. – 11:10 a.m. Lessons About Obesity from Neuroimaging**  
Dr. Angelo Del Parigi, Pfizer, Inc.

**11:10 a.m. – 11:30 a.m. Diet, Weight Loss, and Maintenance**  
Dr. Cary Savage, University of Kansas Medical Center

- 11:30 a.m. – 12:00 p.m.    Neuroimaging of Food Addiction**  
Dr. Nora Volkow, NIDA, NIDDK
- 12:00 p.m. – 12:20 p.m.    Emotion and Cognition**  
Dr. Samuel McClure, Stanford University
- 12:20 p.m. – 1:30 p.m.      Lunch (on your own)**
- 1:30 p.m. – 1:50 p.m.      Eating Disorders**  
Dr. Walter Kaye, University of Pittsburgh Medical Center
- 1:50 p.m. – 2:10 p.m.      Food Craving**  
Dr. Marcia Levin Pelchat, University of Pennsylvania
- 2:10 p.m. – 2:30 p.m.      Neuroimaging of Gut Distention**  
Dr. Allan Geliebter, Columbia University
- 2:30 p.m. – 3:30 p.m.      Panel Discussion**  
Moderator: Dr. Rudolph Leibel, Columbia University
- *What is needed in terms of biomarkers for eating behavior in the brain?*
  - *What questions can be answered with neuroimaging?*
  - *How can information from neuroimaging experiments be interpreted?*
  - *How can neuroimaging inform therapy, etc.?*
  - *How can this information be used to design new informative experiments?*
- 3:30 p.m. – 3:45 p.m.      Wrap-Up**  
Dr. Maren Laughlin, NIDDK  
Dr. Walter Kaye, University of Pittsburgh Medical Center  
Dr. Malcolm Avison, Vanderbilt University
- 3:45 p.m.                      Adjournment**