

NIMBioS Investigative Workshop: Modelling Body Weight Regulation

July 12-15, 2011

Tuesday July 12

8:00-9:00 Breakfast at NIMBioS

9:00-9:20 Introduction to NIMBioS by Lou Gross

9:20-9:40 Introduction of participants

9:40-10:00 Mathematical body weight regulation models from bench to bedside: Navigating translational research *Diana M. Thomas*

10:00-10:15 Break

Modelling Human Weight Change

10:15-10:45 History of Human Weight Change Models *Steven B. Heymsfield*

10:45-11:15 Setpoint, body composition, metabolic adaptation, and weight loss dynamics

Frank Kozusko

11:15-11:45 Open problems in obesity modeling *Carson Chow*

11:45-1:00 Lunch at NIMBioS

Modelling Energy Expenditure

1:00-1:30 Modelling Human Energy Expenditure *Kevin D. Hall*

1:30-2:00 Energy expenditure in response to changes in energy intake and physical activity

Klaas Westerterp

2:00-2:15 Break

2:15-2:45 Energy Expenditure following weight loss. Is it abnormally low? *Gary Hunter*

2:45-3:15 TBA *Eric Ravussin*

3:15-3:30 Break

3:30-4:30 Open group discussion

4:40-6:30 Reception and dinner at NIMBioS

Wednesday July 13

8:00-9:00 Breakfast at NIMBioS

Measuring and Monitoring Adherence

9:00-9:30 Measuring adherence by clinical methods *Sai Das*

9:30-10:00 TBA *Corby Martin*

10:00-10:15 Break

Modelling weight change in pregnancy and children

10:15-10:45 Mathematical modeling of weight gain and weight loss in Children *Nancy Butte*

10:45-11:15 A model for gestational weight gain *Diana Thomas*

11:15-11:30 Break

11:30-12:15 Poster Session

12:15-1:15 Lunch at NIMBioS

1:15-1:45 Energy density of body tissue *Dale Schoeller*

1:45-2:15 Adipose tissue growth and development *Vipul Periwal*

2:15-2:45 An Approach To Modeling Tracer Experiments In Metabolic Non-Steady States

Robert Phair

2:45-3:00 Break

3:00-3:15 Organization of discussion groups

3:15-4:30 Discussion groups

Breakout Session 1 Parameter Estimation Chair: Dale Schoeller

Description: In this breakout session, discussion will focus on how different parameters are measured and how experiments may be designed to improve their estimation. Some of the

parameters of focus are, baseline total energy expenditures, energy density of fat free mass, baseline body composition, baseline resting metabolic rate, percent metabolic adaptation, cost of energy deposition, and the parameter relating the change in spontaneous physical activity to total energy expenditures during weight change.

Breakout Session 2 **Variance and modelling Chair: Kevin Hall**

Description: Variance in day to day measured weight, total energy expenditures, body composition, resting metabolic rates can affect modelling and predictions. In this breakout session, variance in weight over long periods of time will be shown and how this variance impacts modeling and clinical application of model predictions will be discussed.

Breakout Session 3 **Objective Measures of Physical Activity Chair Nancy Butte**

Description: There has been an explosion of portable devices to monitor free-living day to day physical activity. Data collected from the devices are applied to objectively determine physical activity. In this breakout session, examples of the devices and the resulting data will be shown and discussion of how to mine and apply the data for use within models will follow.

4:30-5:15 Discussion group reports to full workshop

5:30-- Dinner on your own at local restaurants

Thursday July 14

8:00-9:00 Breakfast at NIMBioS

Population/Epidemiological Modelling

9:00-9:30 Adding expandability limits of the various fat compartments and its metabolic consequences to models predicting body weight gain. Thorkild Sørensen

9:30-10:00 TBA Gary Sacks

10:00-10:30 TBA Claire Wang

10:30-10:45 Break

10:45-11:45 Open discussion

11:45-1:00 Lunch at NIMBioS

Modeling weight change and disease

1:00-1:30 Game theoretic approach to cancer metabolism *Irina Karev*

1:30-2:00 TBA Vicky Baracos

2:00-2:15 Break

2:15-3:30 Discussion groups

3:30-3:45 Break

3:45-5:00 **Summary of Breakout Sessions-Discuss Future Directions with all participants**

5:00 Dinner on your own at local restaurants

Friday July 15

8:00-9:00 Breakfast at NIMBioS

9:00-10:00 Open discussion

10:00-11:00 Wrap up and future directions

11:00-12:00 Free time for collaboration

12:00- Box lunch and departures