



# SABLE SYSTEMS INTERNATIONAL, INC.

*Instrumentation and Software Solutions*

*By Scientists, For Scientists*

## New Developments in Metabolic Phenotyping

**ANZAC Research Institute**, Concord Hospital NSW 2139



October 14<sup>th</sup> and 15<sup>th</sup>, 2014

Dr. John Lighton of Sable Systems International will describe recent advances in both the acquisition and the analysis of metabolic phenotyping data in pre-clinical research. His talk will cover:

- Time-saving methodologies for increasing throughput rates in multiplexed metabolic phenotyping systems
- How the home-cage advantage of a pull-mode system reliably increases animal safety and dramatically reduces the stress on both the animal *and* the researcher
- The relevance (and ease) of the measurement of water vapor as a fundamental component of the metabolic equation
- The importance of retention of raw data in the course of metabolic phenotyping. The transparency of the *deep data field* format leads to greater traceability, improved reliability, and much greater versatility in terms of data extraction to address specific research objectives.

Finally, he will demonstrate how a combination of these new developments makes it possible to assign exact metabolic costs to transient activities, with important implications in energy balance, obesity and metabolic disease studies.

**For inquires and registration please contact Julie Taranto: [jtaranto@anzac.edu.au](mailto:jtaranto@anzac.edu.au) +61 2 9767 9191**

**About Dr. John Lighton** - the president, Chief Scientist, principle designer at Sable Systems and a world expert on respirometric methodology. His expertise ranges in scope from human room calorimetry, translational energetics to evolutionary physiology, and in scale from *Drosophila* to Whales. Still active in research, he has over 80 peer-reviewed publications on respirometry in the scientific literature, including Nature, PNAS, Science and The Journal of Experimental Biology. Dr. Lighton is also the author of the preeminent work on respirometry: "[Measuring Metabolic Rates: A Manual for Scientists](#)", published by Oxford University Press.

*"John Lighton has probably done more to modernize and consolidate the field of whole-animal respirometry than any single person"*

Dr. Theodore Garland, Jr. UC Riverside

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## October 14<sup>th</sup> 2014

**Objectives:** Introductions for Dr. Lighton and Dr. Rising as well as participants with descriptions of their respective fields of research. History and theory of respirometry.

**Lunch** 12:00 – 14:00

**Respirometry 101 with Dr. Lighton** 14:00 – 1600

- History of respirometry
- Why do respirometry?
- Types of respirometry systems
- Functional constraints of all systems
- The importance of “Base-lining”
- Water vapor dilution and how to correct for it

## October 15<sup>th</sup> 2014

**Objectives:** Working with respirometry and behavioral data. Data import/export for interoperability with other systems. Whole room calorimetry.

**The Promethion platform** 9:30 – 10:30

- General Promethion architecture (CAN bus, daisy chaining etc.)
- Instruments available and use cases (Rodent Phenotyping), interchangeability and modularity gives flexibility, 3<sup>rd</sup> party integration
- The “data field” metaphor, importance of retaining raw data

**Break** 10:30 – 10:45

**Building data processing pipelines** 10:45 – 12:30

- ExpeData introduction
- ExpeData Macros
- Introduction to the Universal Macro Collection
- Import Example: Telemetry data
- Exporting data to CSV
- Exporting aggregated data to Excel or CSV

**Lunch** 12:30 – 13:30

**Room Calorimetry (Dr. Russell Rising)** 13:30 – 14:30

- Whole Room Calorimetry
- Advantages over / Synergies with metabolic carts, masks and canopies
- Use Case: Energy expenditure of infants
- Use Case: Energy expenditure of performing artists

**Break** 14:30 – 14:45

**Processing rodent behavioral data** 14:45 – 15:45

- Food and Water Intake
- Body Mass
- Animal Movement
- EthoScan

**Wrap up** 15:45 – 16:30

- Free form open discussion