



COMETT - MERGE
Community Action Programme in Education and Training for Technology

METABOLIC ENERGETICS
IN ECOLOGICAL, CELLULAR AND BIOMEDICAL RESEARCH

Department of Biological Sciences
University of Wales, Aberystwyth, UK

March 1-3, 1993

Lecturers

Julie Benstend, University of Wales, Cardiff
C.L. Davey, University of Wales, Aberystwyth
Erich Gnaiger, University of Innsbruck, Austria
Roy Goodacre, M.J. Neal, University of Wales, Aberystwyth
Douglas B. Kell, University of Wales, Aberystwyth
Richard B. Kemp, University of Wales, Aberystwyth
David Lloyd, University of Wales, Cardiff
Ronald Pethig, University of Wales, Bangor

Aim of Workshop

State-of-the-art presentation of instrumental developments, particularly respirometric and microcalorimetric approaches in biological energetics and biomedical research; introductory lectures; presentation and discussion of research applications; equipment and software demonstration.

Areas of interest

Comparative, cellular and ecological physiology; bioenergetics; medical research; ecotoxicology; biotechnology.

Instrumentation

Thermal Activity Monitor (ThermoMetric AB, Sweden).
OROBOROS *Oxygraph* (ANTON PAAR KG, Graz, Austria).
Software: DIGITAM, Data Acquisition and Analysis (ThermoMetric).

Support

COMETT-ATTAC (Alpine Training Association Center, Innsbruck)
University of Wales, Aberystwyth
A. PAAR KG, Graz, Austria; OROBOROS, Grinzens/Innsbruck, Austria
ThermoMetric Ltd., Northwich, UK (Robert L. Taylor)
Aber Instruments Ltd., Aberystwyth

Seminar Location	Department of Biological Sciences University of Wales ABERYSTWYTH, Dyfed Wales SY23 3DA, UK	
COMETT organizer	Dr. Erich Gnaiger Department of Transplant Surgery Research Division University Clinic of Innsbruck Anichstr. 35 A-6020 INNSBRUCK, Austria Tel: +43 512 504 2601 Fax: +43 512 504 2605	OROBOROS Trogerhof Neder 52 A-6094 Grinzens/Innsbruck Austria Tel./Fax: +43 5234 7045
Local Organizer	Dr. Richard Kemp Department of Biological Sciences University of Wales ABERYSTWYTH, Dyfed Wales SY23 3DA, UK Tel: +44 970 623111 Fax: +44 970 622350	
Registration	For registration, please contact the local organizer by February 20, 1993. Registration fee outside the University of Wales: £ 25.-- to be paid at the registration desk: main entrance, Edward Llwyd Building	
Accommodation	Bookings are possible if registration is made with the local organizer by February 20, 1993. Costs vary in the range of £ 15.- to £ 40.- (bed & breakfast in hotel). Please, specify cost range in your registration.	
Travel	The local organizers will give advice.	
Further information	can be obtained from the organizers, and: ThermoMetric Ltd. Robert L. Taylor , managing director 10 Dalby Court Gadbrook Business Park NORTHWICH Cheshire, CW9 7TN, UK Tel: +44 606 49007 Fax: +44 606 48924	

PROGRAMME

METABOLIC ENERGETICS IN ECOLOGICAL, CELLULAR AND BIOMEDICAL RESEARCH

University of Wales, Aberystwyth, March 1-3, 1993

International Seminar COMETT - MERGE

Monday, March 1

09:00 **Registration:** Edward Llwyd Building, main entrance

Morning: **Methods in Biological Calorimetry and Respirometry**

09:30 **Opening remarks.** *Richard B. Kemp, Aberystwyth*

10:00 **Design, function and an overview on applications of the OROBOROS Oxygraph.**
Erich Gnaiger, Innsbruck

11:00 Coffee/tea break

11:30 **Design, function and an overview on biological applications of the ThermoMetric Thermal Activity Monitor.** *Erich Gnaiger and Richard B. Kemp*

02:00 Afternoon: **Instrument and Software Demonstration**

Thermal Activity Monitor (ThermoMetric AB, Sweden) with Software: DIGITAM, Acquisition and Analysis (ThermoMetric). *Bob Taylor, Northwich*

OROBOROS Oxygraph, ANTON PAAR KG, Graz, Austria; *Erich Gnaiger*

04:00 Coffee/tea break

05.00 **Evening lecture:**

The potential of calorimetric measurements in the analysis of growth by cultured animal cells. *Richard B. Kemp, Aberystwyth*

Tuesday, March 2

Morning: **Mitochondrial and Cellular Energetics**

09:00 **The Measurement of P/O Ratios in Isolated Mitochondria: High-Resolution ADP Pulse Respirometry versus Stopped-Flow Respirometry.** *Erich Gnaiger and Gabriela Méndez*

10:00 **Aerobic and anaerobic metabolism in cultured mammalian cells.** *Richard B. Kemp*

11:00 Coffee/tea break

11:30 **Oxygen dependence of respiration: Oxygen limitation and down-regulation.**
Erich Gnaiger and Rosmarie Steinlechner

02:00 Afternoon: **Instrument and Software Demonstration**

GEPASI, Metabolic Simulator. *P. Mendes, Aberystwyth*

Thermal Activity Monitor and DIGITAM. *Bob Taylor, Northwich*

OROBOROS Oxygraph, ANTON PAAR KG, Graz, Austria; *Erich Gnaiger*

04:00 Coffee/tea break

05:00 **Evening lecture:**

Efficiency of oxidative phosphorylation under severe hypoxia: A novel approach by oxygen injection calorimetry. *Erich Gnaiger and Gabriela Méndez*

Wednesday, March 3

Morning: **Biological Applications of Mass Spectroscopy**

09:00 **Membrane inlet quadrupole mass spectroscopy for the measurement of biological gas exchange.** *David Lloyd, Cardiff*

10:00 **On the measurement of gaseous exchange in methanogenic systems.**
Julie Benstead, Cardiff

11:00 Coffee/tea break

11:30 **Who's there? Quantification and classification of biological systems using pyrolysis mass spectroscopy and neural networks.**
Roy Goodacre, M.J. Neal and Douglas B. Kell, Aberystwyth

Afternoon: **Dielectrics**

01:30 **Dielectrophoresis.** *Ronald Pethig, Bangor*

02:30 **Dielectrics and the quantification of microbial biomass.** *C.L. Davey and Douglas B. Kell*
Instrument Demonstration: Biomass Monitor. *Aber Instruments Ltd., Aberystwyth*

04:00 Coffee/tea break

04:30 **Final discussion and conclusions**