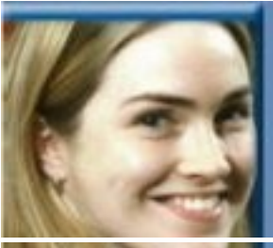
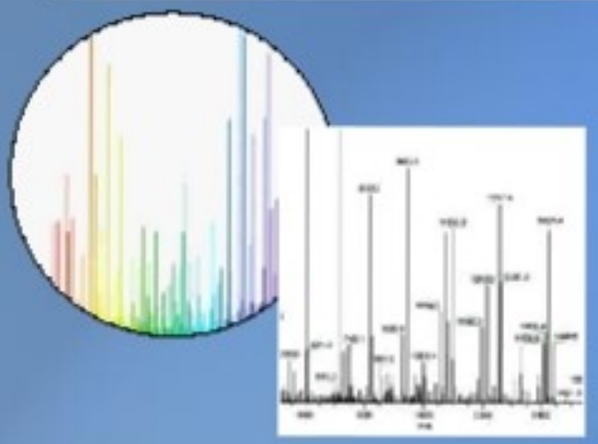
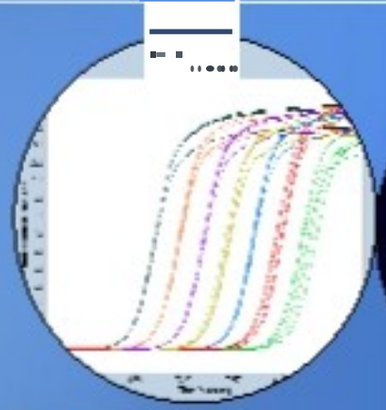
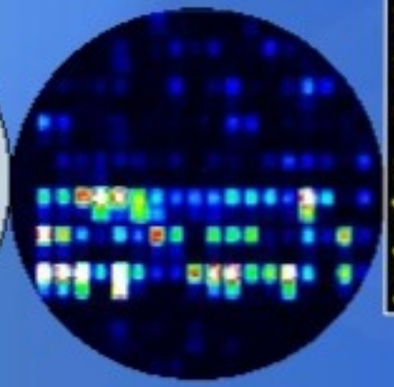
Core Facilities at the University of Aberdeen

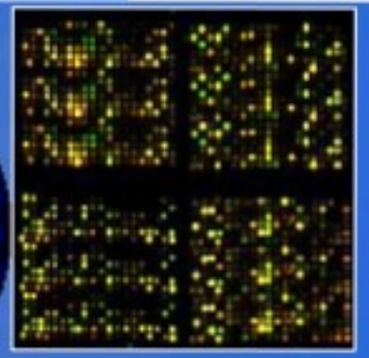
UNIVERSITY OF ABERDEEN

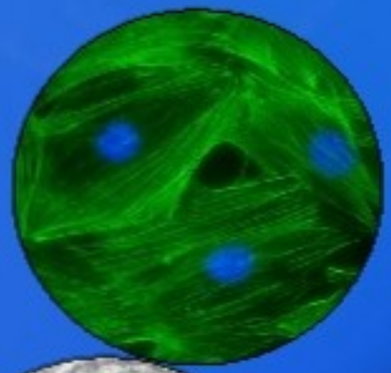


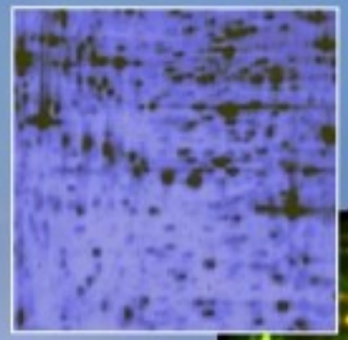


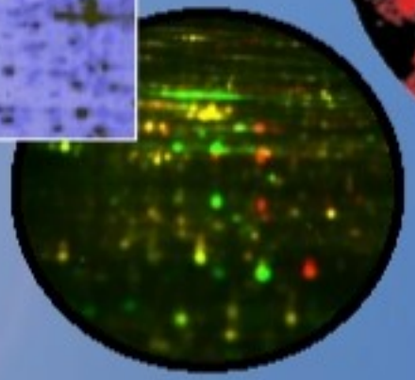


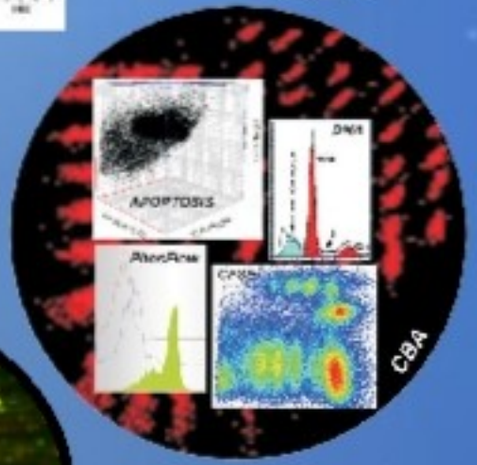


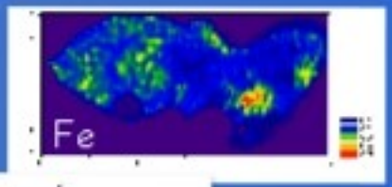


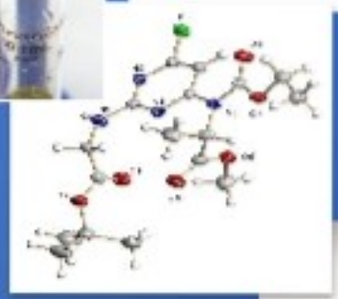


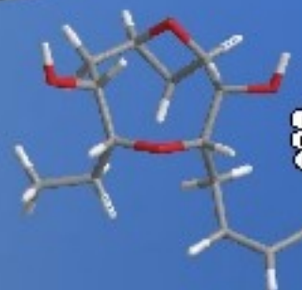












Core Facilities at the University of Aberdeen

UNIVERSITY OF ABERDEEN

Providing access to technology and research services for the biosciences

- A wide range of research technologies available to researchers.
- Facilities are distributed across a number of locations, but principally are associated with the Institute of Medical Sciences, School of Chemistry, School of Biological Sciences and The Rowett Institute of Nutrition and Health.
- Various training opportunities – including one-to-one instruction, extended visits, tailored training, and hands-on courses. Courses include a Technology Insight Day, Practical Proteomics, Basic Introduction to Microscopy and hands-on Flow Cytometry course.

The Future

Rowett Institute of Nutrition and Health
University of Aberdeen

The Analytical Facility in the New RINH Building on the Foresterhill Campus

- **Mass Spectrometry**
- **Proteomics**
- **Analytical**

} **combining RINH and IMS facilities**

RINH Genomics will re locate with Genomics in the IMS Building

Analytical Services at the Rowett Institute of Nutrition and Health

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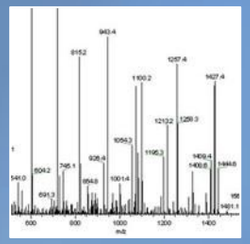
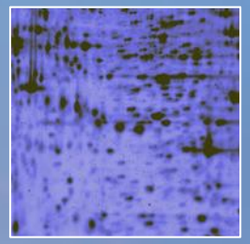
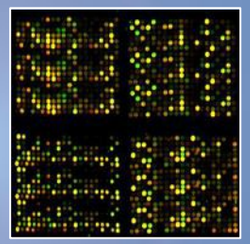
Analytical Chemistry



Mass Spectrometry



Proteomics



Genomics

www.rowett.ac.uk/institute/analytical.html

Contact Eric Milne
tel: 716610
email: e.milne@abdn.ac.uk

Analytical Chemistry

Rowett Institute of Nutrition and Health
University of Aberdeen

Proximate Analysis: for diet composition

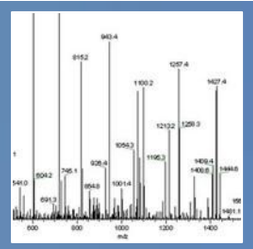
Gas Chromatography: estimation of sugars and long/short chain fatty acids

High Performance Liquid Chromatography (HPLC):
measuring amino acids, vitamins and nucleotides

Clinical Analysis: for various blood parameters

Luminex X-Map Technology: analyse up to 100 cytokines or endocrines simultaneously on a few microlitres of sample

Contact David Brown tel: 712751 email: david.brown@abdn.ac.uk
Viv Buchan email: v.buchan @abdn.ac.uk



Mass Spectrometry 1

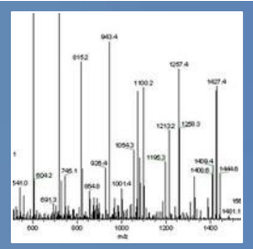
Rowett Institute
of Nutrition and Health
University of Aberdeen

Gas Isotope Ratio Mass Spectrometry

Gas Chromatography Mass Spectrometry

- **Tracer kinetic studies** — **Protein Metabolism**, **Urea Kinetics**, **Body Composition**, **Energy Expenditure**, **Fatty Acid Metabolism**
- **Structural Analysis**
- **Quantitative analysis using isotope dilution**

Contact Eric Milne tel: 716610 email: e.milne@abdn.ac.uk



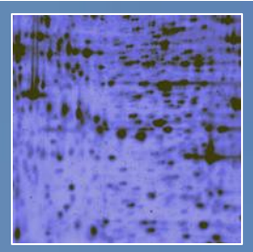
Mass Spectrometry 2

Rowett Institute of Nutrition and Health
University of Aberdeen

Liquid Chromatography Mass Spectrometry

- **Protein ID by peptide sequencing**
- **Metabolite identification and quantification**
- **Metabolomics**

Contact Eric Milne tel: 716610 email: e.milne@abdn.ac.uk



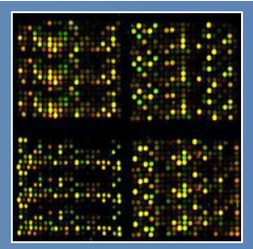
Proteomics

Rowett Institute of Nutrition and Health
University of Aberdeen

The Proteomics Unit fully supports the research scientists' needs for protein separation by 2D electrophoresis, image analysis and subsequent identification by mass spectrometry of tryptic peptides.

- **2D PAGE**
- **Image Analysis**
- **Spot Picking**
- **Trypsin Digestion**
- **MALDI Mass Spectrometry**

Contact Garry Rucklidge tel: 716640 email: g.rucklidge@abdn.ac.uk



Genomics

Rowett Institute of Nutrition and Health
University of Aberdeen

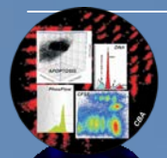
- DNA sequencing, SNP analysis
- Agilent BioAnalyser analysis
- GeXP Gene expression
- Real-time quantitative PCR

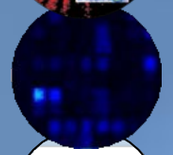
- Micro- and macro-array spotting
- Micro-array hybridisation, scanning and analysis
- Colony picking
- Robotic liquid handling
- 96-well based PCR and Plasmid mini-preps

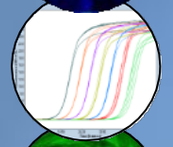
Contact Gill Campbell tel: 716627 email: g.campbell@abdn.ac.uk

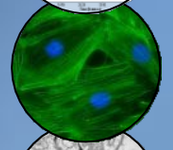
Core Facilities at the Institute of Medical Sciences

UNIVERSITY OF ABERDEEN


Flow Cytometry and Cell Sorting


Genomics

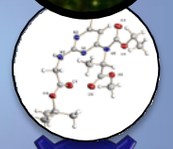

Real-time PCR


Microscopy and Cellular Imaging


Histology and Electron Microscopy


Mass Spectrometry and LC


Proteomics


Synthetic Organic Chemistry


The Kosterlitz Centre for Therapeutics

www.abdn.ac.uk/ims/facilities

Contact David Mackenzie
tel: 53347
email: d.mckenzie@abdn.ac.uk

Flow Cytometry and Cell Sorting

Cytometry provides an immensely powerful tool to measure multiple parameters of single cells:

- ☐ Single Cell Sorting in different devices
- ☐Up to 13 different parameters in parallel
- ☐Apoptosis, Proliferation and Metabolism (e.g. Ca^{2+}, membrane potential)
- ☐Gene Reporter assay (e.g. GFP, lacZ)
- ☐PhosPhoFlow: Phospho-Protein assay (e.g. STAT, p38, JNK)
- ☐DNA content: cell cycle or DNA ploidy analysis
- ☐Microbiological Cytometry: Bacteria, Yeast, Phytoplankton etc..
- ☐Multiplex Bead Cytometry: CBA and Luminex
- ☐Customer oriented consulting

Contact: Liz Adams tel: 437580 email: l.adams@abdn.ac.uk
Linda Duncan tel: 437300 email: l.duncan@abdn.ac.uk
Kimberley Sim tel: 437300 email: k.sim@abdn.ac.uk

Genomics

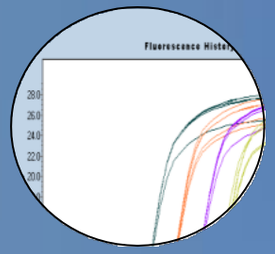
UNIVERSITY OF ABERDEEN

Providing expertise and state-of-the-art technology for analysis of the transcriptome, genome and epigenome:

Affymetrix Microarray Core Facility

- Nanodrop and Tapestation for sample QC.
- Preparation of labelled RNA or DNA in 96-well plate format for hybridisation to microarrays.
- Affymetrix GeneChip platforms – expression, tiling, resequencing, SNP, cytogenetic, drug metabolism (DMET) and targeted genotyping oligonucleotide microarrays.

Contact Elaina Collie-Duguid email: e.collie-duguid@abdn.ac.uk
Diane Stewart tel: 54838 email: d.l.stewart@abdn.ac.uk



Quantitative PCR

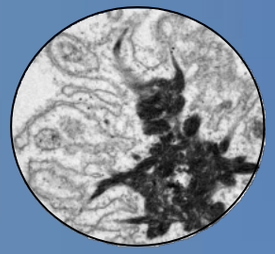
UNIVERSITY OF ABERDEEN

Real-time Quantitative PCR

- **Gene expression studies, e.g.**
  - **Validate microarray studies**
  - **Confirm siRNA knockdown**
- **Genotyping by single nucleotide polymorphisms**
- **Screen for variation by high resolution melt curves**
- **Assess methylation status**

- **Happy to discuss your needs and advise on experimental design, from sample preparation to data analysis.**

Contact Alun Hughes tel: 55162 email: a.hughes@abdn.ac.uk



Histology & Electron Microscopy

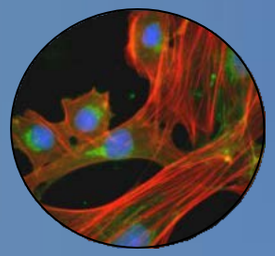
www.abdn.ac.uk/ims/histology

1 4 9 5 UNIVERSITY OF ABERDEEN

- Automated processing and embedding of tissues for frozen, wax, acrylic and epoxy resin.
- Sectioning of frozen (cryostat), wax and resin embedded samples.
- Automated Immunohistochemistry - Dewaxing, Heat Induced Epitope Retrieval (HIER), DAB enhancer and contrast staining available.
- Transmission Electron Microscopy - Morphological Analysis.
- Leica EM PACT2 High Pressure Freezer and AFS2 freeze substitution/ low temperature embedding system.
- Scanning Electron Microscopy.

- Training available on use of equipment from facility staff.

Contact	Kevin Mackenzie	tel: 51130	email: k.s.mackenzie@abdn.ac.uk
	Gillian Smith	tel: 55911	email: gillian.smith@abdn.ac.uk



Microscopy & Cellular Imaging

www.abdn.ac.uk/ims/microscopy

1 4 9 5 UNIVERSITY OF ABERDEEN

- Light and Fluorescence Microscopy - all microscopes (invert and upright) have brightfield, phase contrast and fluorescence capabilities with digital imaging.
- Apotome system on Zeiss Imager M2 upright microscope.
- Confocal Microscopy – Zeiss LSM510 (upright, 3 lasers) and LSM 710 (invert, 4 lasers).
- Live Cell Imaging –Deltavision Core - includes point-revisiting, time-lapse, real-time Z-sweep acquisition.
- Laser Microdissection – Zeiss Microbeam.
- Micro CT – Skyscan 1072.

- Training and advice available from facility staff.

Contact	Kevin Mackenzie	tel: 51130	email: k.s.mackenzie@abdn.ac.uk
	Debbie Scott	tel: 51130	email: d.i.scott@abdn.ac.uk

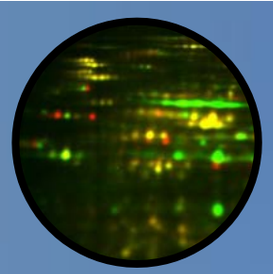
Liquid Chromatography-Mass Spectrometry

UNIVERSITY OF ABERDEEN

Providing an analytical service for the detection and quantification of xenobiotics and their metabolites and endogenous compounds in biological samples

- **Full sample preparation capabilities including solid phase extraction**
- **LC-MS-MS analysis utilising a Thermo Surveyor-TSQ Quantum system**
- **Conventional HPLC with UV and fluorescence detection**
- **Reversed/normal phase, hydrophilic interaction and chiral separations**
- **Endocannabinoids, Methylated arginines, (R)-(S)-Warfarin, GSH/GSSG**

Contact **Gary Cameron** **tel: 51131** **email: g.a.cameron@abdn.ac.uk**
Gay Hawksworth **tel: 52487** **email: g.m.hawksworth@abdn.ac.uk**



Proteomics

UNIVERSITY OF ABERDEEN

Providing expertise and state-of-the-art technology for protein/peptide analysis including:

- Difference gel electrophoresis (2D-DIGE)
- Protein sequencing
- Liquid chromatography-mass spectrometry (LC-MS)
- MALDI-TOF mass spectrometry (peptides and whole proteins)
- Quantitative proteomics (stable isotope tagging, label-free)

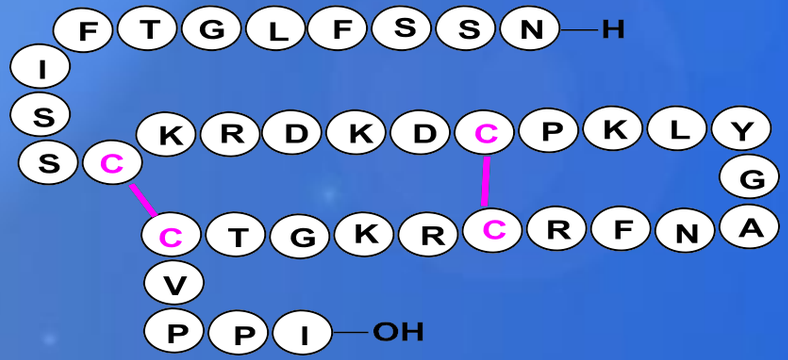
Contact	Phil Cash	tel: 55809	email: p.cash@abdn.ac.uk
	David Stead	tel: 55804	email: d.stead@abdn.ac.uk

Aberdeen proteomics

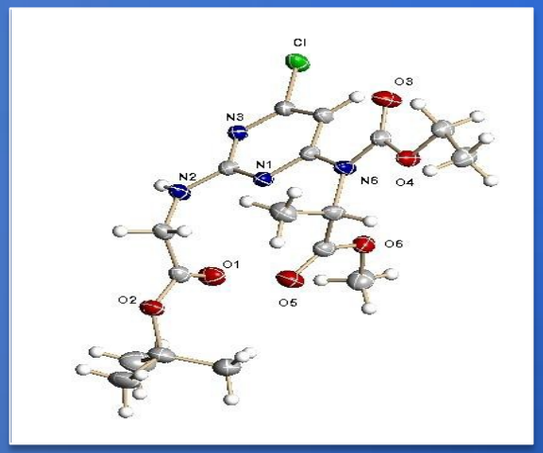
Synthetic Organic Chemistry

UNIVERSITY OF ABERDEEN

- Synthesis of **Polypeptides**



- Synthesis of **Small Molecules**



Contact Matteo Zanda, IMS tel: 55732 email: m.zanda@abdn.ac.uk

A Bridge from Innovation to Impact

Kosterlitz Centre for Therapeutics

Kosterlitz

- Identification of opportunity
- Provision of seed funding
- Assembly of interdisciplinary teams
- Networking and fund-raising
- Commercial partnering
- Medicinal / synthetic chemistry
- Outsourcing
- Pharmacology /mechanism of action
- Patenting and IP management

Innovation

- *Novel receptor, ligand, pathway or enzyme involved in disease*
- *Novel disease model system*
- *New biomarkers for disease*

Impact

- *Commercially-valuable drug, biomarker, diagnostic or drug screening system*
- *Validated disease target*
- *Translational grants*
- *Industrial partnerships*
- *Patents and publications*
- *Unique training*

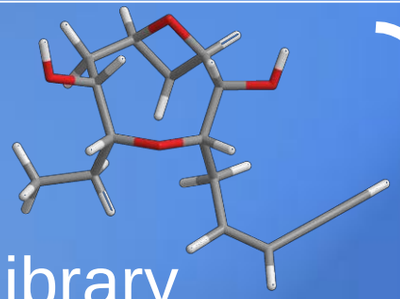
Translating biological innovation into novel therapeutics

http://www.abdn.ac.uk/kosterlitz

Core Facilities in Chemistry

UNIVERSITY OF ABERDEEN

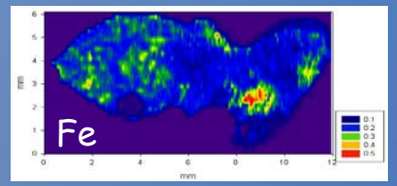
Organic Chemistry



- Natural Product Library
- Small organic molecule analysis

Inorganic Chemistry

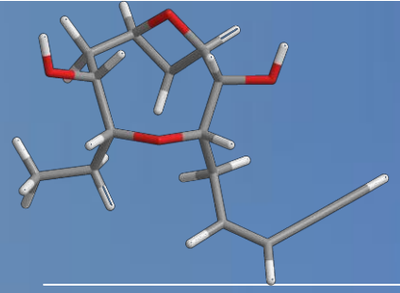
- Trace element analysis
- Speciation analysis
- Imaging of trace elements



Contact Marcel Jaspars
tel: 272895
email: m.jaspars@abdn.ac.uk

http://www.abdn.ac.uk/chemistry/research/

Contact Joerg Feldmann
tel: 272911
email: j.feldmann@abdn.ac.uk



Natural Product Library

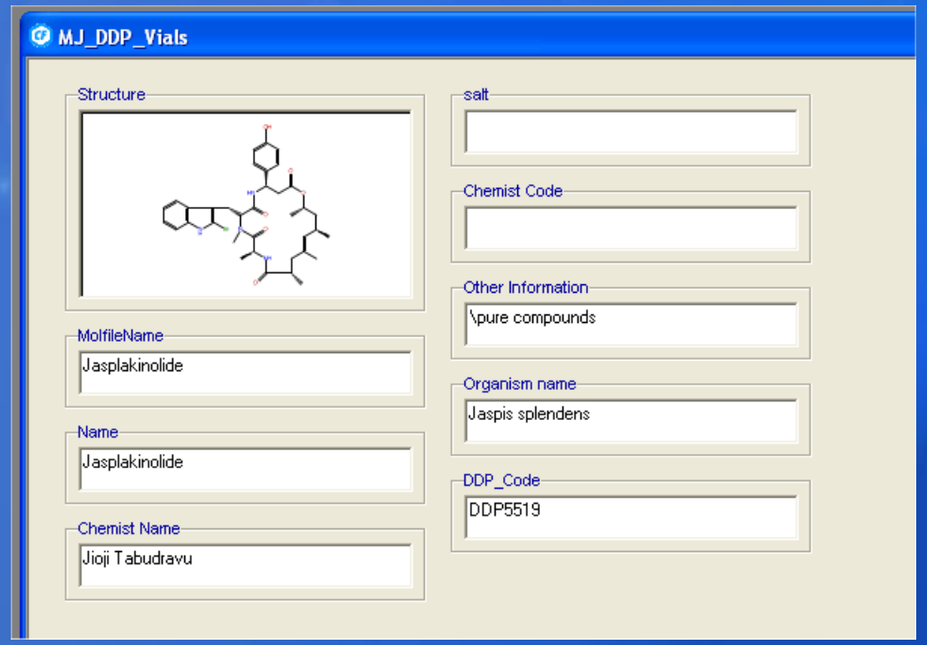
1 4 9 5 UNIVERSITY OF ABERDEEN

Library of Defined Natural Products for Biomedical Research

200 + pure compounds of marine and plant origin

Provided as stock solution in DMSO (20 mM)

More compounds being added all the time



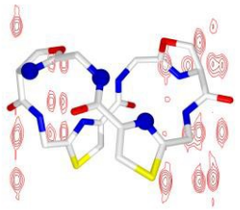
Library of Organism Extracts

Contains semi-purified extracts of organisms:

- Marine invertebrates
- Marine bacteria
- Marine Fungi

Contact Marcel Jaspars tel: 272895 email: m.jaspars@abdn.ac.uk

Wael Houssen tel: 555775 email: w.houssen@abdn.ac.uk



Small Organic Molecule Analysis

UNIVERSITY OF ABERDEEN

Structural characterisation of organic compounds

Spectroscopic expertise:

Nuclear magnetic resonance (NMR)
Liquid chromatography - mass spectrometry (LC-MS)
Structure determination of known and novel organic compound

Equipment:

Varian 600 MHz and 400 MHz NMR systems
Thermo Orbitrap Discovery LC-MS

Contact Marcel Jaspars tel: 272895 email: m.jaspars@abdn.ac.uk
Rainer Ebel tel: 272930 email: r.ebel@abdn.ac.uk

Br, As, Se,
Pb, Fe, Pb,
Hg, S, P, Ag

Trace Element Analysis

1 4 9 5 UNIVERSITY OF ABERDEEN

Quantification of trace elements in environmental, biological, pharmaceutical and technical products

Providing expertise: Extraction and digestion procedures for solid samples
Matrix elimination for quantification
Isotope ratio measurements for metals and metalloids
Isotope dilution analysis

Instrumentation: Inductively-coupled plasma mass spectrometry (high resolution, time-of-flight and quadrupole)
Atomic absorption spectrometry
Atomic fluorescence spectrometry (As, Se, Hg)

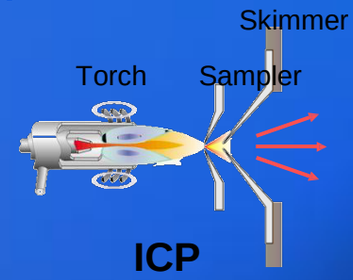
Contact Joerg Feldmann tel: 272911 email: j.feldmann@abdn.ac.uk
Andrea Raab tel: 274349 email: a.raab@abdn.ac.uk

Trace Element and speciation analysis for Petrochemical Industry

UNIVERSITY OF ABERDEEN

Providing expertise: quantification of trace elements

a) in liquid samples (water, oil or extracts and digests)
b) in gases samples (natural gas, condensates)
c) in solid samples (scales, oil shale)



Instrumentation:

Gas chromatography coupled to ICP-MS
Laser ablation ICP-MS
HPLC coupled to ICPMS

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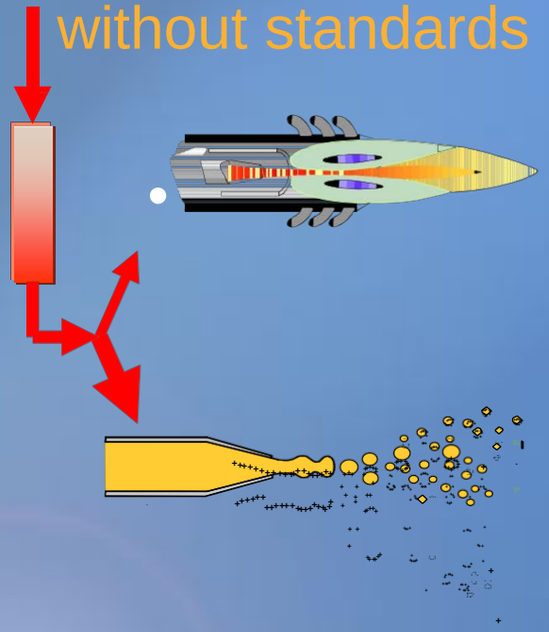
Advanced element speciation analysis

UNIVERSITY OF ABERDEEN

Providing expertise: structural identification and **quantification** of molecules containing a heavy hetero-element such as sulphur, phosphorous, arsenic, etc. without standards



Instrumentation: HPLC coupled to Element 2 (high resolution ICP-MS)

and

to Orbitrap (High resolution ES-MS)

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Imaging of trace elements

UNIVERSITY OF ABERDEEN

Providing expertise: element analysis with spatial resolution of minor and trace elements in thin sections and gels

- Quasi non-destructive microanalysis for trace elements
- Quantitative spot analysis and depth profiling for trace metals
- Absolute quantification of metalloproteins (SOD)
- 2D imaging of trace elements in biological thin sections
- 2D imaging of trace elements in artificial materials and geological samples

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Instrumentation: Laser ablation coupled to ICP-MS
CETAC LSX 200+: 266 nm Nd:YAG

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