

Manchester's 'first step' to perfect drug combinations

Scientists at The University of Manchester have discovered a way of speeding up the creation of perfect drug combinations, which could help patients recovering from critical health problems such as stroke, heart attacks and cancer.

The researchers found a way of identifying ideal drug combinations from billions of others which would prevent inflammation from occurring. The findings, published in *Nature Chemical Biology*, could be the first step in the development of new drug combinations to combat severe diseases and conditions.

Most non-infectious disease, such as cancer, stroke and Alzheimer's are worsened by inflammation, which is the body's natural defence mechanism. Inflammation has evolved to help fight infection but can also be very damaging in long term disease, prolonging suffering and ultimately risking premature death.

After a stroke, the body reacts to the injury as if it were an infection, causing further damage. By blocking the inflammation, the chances of survival or higher quality of life following a stroke are thus greatly enhanced. Using ideal drug combinations the researchers suggest they can block inflammation and therefore greatly reduce the damage caused by non-communicable diseases such as stroke. Although the researchers have initially concentrated on stroke, they believe the process can be applied to all drugs and for a huge variety of diseases.

The multi-disciplinary team of researchers was led by [Professor Douglas Kell](#), Professor of Bioanalytical Science. Professor Kell and his team worked with computer scientists at the University to create the programme. [Professor Pedro Mendes](#) explains: "Our experiments were guided by software that is based on an evolutionary algorithm. The algorithm suggests new drug combinations from previous ones by re-mixing their components – much like the DNA of a child is a mix of that of their parents. "The new drug combinations are then tested and the best are selected to continue generating new ones. In each experiment we tested 50 drug combinations, then the software would tell us which new ones to test in the next experiment."

Efficient discovery of anti-inflammatory small-molecule combinations using evolutionary computing. Ben G Small, Barry W McColl, Richard Allmendinger, Jürgen Pahle, Gloria López-Castejón, Nancy J Rothwell, Joshua Knowles, Pedro Mendes, David Brough and Douglas B Kell [Paper](#)

£1.6m grant success for bioprocessing research

The University of Manchester has secured two project grants worth a total of £1.6 million from the Bioprocessing Research Industry Club (BRIC).

Funding for a multidisciplinary project by [Dr Robin Curtis \(SCEAS\)](#), Professor Jeremy Derrick (FLS), [Dr Jim Warwicker \(FLS\)](#) and Professor Alan Dickson (FLS) will be used to address the problems associated with the process of biopharmaceutical aggregation.

The second BRIC project grant has been awarded to [Professor Hans Westerhoff \(SCEAS\)](#), [Professor Roy Goodacre \(SCHEM\)](#) and Professor Alan Dickson (FLS) to investigate the predictability of biopharmaceutical protein production.

In addition, two research groups based in the MIB have been awarded BRIC PhD studentships

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Special points of interest:

- Marketing & Communications Committee
- Christmas Party—16/12/11

Funding News

Christopher Blanford (MIB/SMAT), Royal Society

High-Throughput electrochemical screening of redox-active enzymes and enzyme-coated electrodes; £14,997

Wendy Flavell (PI) (PSI/Physics), Darren Graham (PSI/Physics), **Nigel Scrutton (MIB/FLS)** EPSRC-Shaping Capability

Tunnelling through barriers: new insights into biological catalysis from photon science; £31.7K

Paul Popelier EPSRC-Developing Leaders *Development of a novel force field for polypeptide*; £17,931

Peter Fielden (PI) & Nick Goddard EPSRC-Delivering Impact *Whispering Gallery Mode Sensors Fabricating using Two Photon Polymerisation* £32,601

Paul Popelier (PI) & Ewan Blanch University Award *An Interdisciplinary Approach to Revealing Carbohydrate Structure* £25,239

Simon Webb (PI) Ewan Blanch, & Jonathan Clayden EPSRC-Shaping Capability *Studying conformational change in membrane-bound peptides using ROA* £20,780

Ewan Blanch, Cinzia Casiraghi, Helen Gleeson, **Royston Goodacre**, Matthew Halsall, Ian Kinloch, Philip Martin, Robert Young EPSRC-Equipment Sharing *Enabling Cross and Intra-Faculty Raman Sharing* £37,874

Neil Dixon and **Jason Micklefield** BBSRC Follow-on funding pathfinder award. *Market Analysis and Intellectual Property Management of Gene Expression Control Technology* £10k

Funding Calls

BBSRC Tools and resources development fund: Call 1 [website](#)

Support for development of novel tools, methods and technologies in the biosciences

Application deadline: 29 November 2011, 4pm



Summary Our Tools and Resources Development Fund (TRDF) aims **to pump prime the next generation of tools, technologies and resources that will be required by bioscience researchers in scientific areas within BBSRC's remit**. It is anticipated that successful grants will not exceed £120K ([ref 1](#)) and a fast-track, light touch peer review process will operate to enable researchers to respond rapidly to emerging challenges and opportunities.

A number of different types of proposal are eligible for consideration under this call of the TRDF:

- **Early concept, exploratory investigations of new tools, technologies and resources.** The key feature of a successful 'early concept, exploratory' research project application is a technology or methods oriented approach that is enabling and adventurous, and encapsulates the concept of 'high-risk/high reward'. Funded projects are expected to test the 'high-risk, high reward' concept and, where successful, demonstrate proof-of-principle'.
- **Rapid access to and deployment of the very latest cutting edge technology.** It is anticipated that these applications would include collaboration with the technology provider;

Radical, novel modifications to existing tools, technologies and resources. To facilitate new biological understanding and an expansion in use.

Applications should be novel and adventurous and be aimed at developing new tools. This fund is intended to support genuinely early concept development, particularly where little pilot data exists.

Applications for projects should be between 6 and 18 months duration.

Aim

To help scientists add an international dimension to their BBSRC funded research by making and establishing new contacts with international counterparts

Scope

Funding is available for:

- **Short Term Travel Award:** Normally intended as a first contact-type meeting. Allows researchers to travel outside the UK to initiate collaboration or prepare proposals with partners for international programmes (e.g. EU Framework, Human Frontier Science Program)
- **Long Term Travel Award:** For researchers to travel outside the UK for periods of up to 12 months
- **Access Award:** For stays of up to one month in another country to undertake a specific piece of work, access facilities not available in the UK or gain access to new techniques or materials, which would be of benefit to the BBSRC project or the UK research team
- Funding is limited to travel and subsistence costs only, and does not usually exceed ~£5k.

EPSRC has announced two key changes to its peer review process which will be phased in over the next six months.

1. National Importance will become a primary assessment criterion alongside Research Quality from 15th November.

Applicants will need to clearly identify the national importance of their proposed research project, over a 10-50 year time frame. This should be articulated in relation to other research in the area, explaining how it aligns to national UK priorities, responds to user/stakeholder pull or underpins priority areas for other research councils. All proposals submitted from 15th November will need to include National Importance within their case for support. Reviewers will be asked to consider national importance as well as research quality in their assessment and panel members will be asked to prioritise based on research quality and national importance as the primary criteria.

2. Fit to the EPSRC portfolio will be considered as part of the peer review process.

The details of this change are being developed with a group of key external stakeholders. There are a number of options EPSRC wish to test and pilot with peer reviewers and changes will not be implemented until Spring 2012.

EPSRC intend to hold a series of regional workshops on National Importance. These will focus on advice for applicants and reviewers.

Research News

MIB mini Research Symposium

A cross section of MIB research was showcased at the mini research symposium last week as we welcomed our new PhD students to the MIB. The event included a talk by new MIB academic Robin Curtis on understanding weak protein-protein interactions. Unfortunately, Clare Mills the new Professor of Molecular Allergology was unable to speak at short notice but we hope to schedule a talk in the near future on her work on antigens and allergens. We had a good number of nominations for talks and sadly were unable to accommodate everyone.

Young Researcher Seminar Series

Given the demand to give a talk at the research symposium we are interested in receiving your comments on whether you would like to resurrect the PDRA/PhD seminar series. Please let [Ros Le Feuvre](#) have any comments.

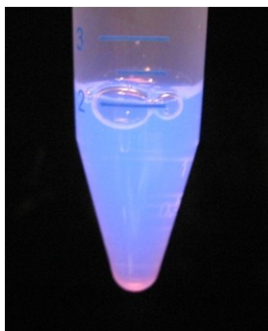
Manchester Science Festival—Science Spectacular Event with ‘Nature’s Catalysts’



The MIB was represented at the “Science Spectacular” event (part of the Manchester Science Festival) by a team from CoEBio3, whose “Nature’s Catalysts” exhibition explained enzymes and the uses of Industrial Biotechnology to the wider community.

Visitors to the Nature’s Catalysts stand were able to carry out simple and practical enzyme experiments, and also see how enzymes are used in everyday life for the production of household

chemicals and foodstuffs. The younger members of the audience were particularly impressed with the ‘enzyme volcano’ (a magical mix of hydrogen peroxide, catalase enzyme and detergent!), whilst adult visitors were interested to learn that lactose free milk is made by using enzymes. The enzymatic glow in the dark experiment was “mega cool”, at least according to one young visitor!



The Nature’s Catalysts team. Left to right: Claire Doherty, Kirk Malone, Rachel Heath, Ian Rowles, Emma Fellows, Simon Willies, Miguel de Abreu Felipe

Story by Dr. Kirk Malone
Research Team Leader
CoEBio3, MIB
(+44)161 306 5104
www.coebio3.org

Congratulations

Dr Anil Sebastian PDRA in the lab of **Dr. Ardeshir Bayat** came runner up in the prestigious young investigator award for the European Tissue Repair Society meeting held in the Netherlands from 5-7 Oct for his work entitled: *Acceleration of cutaneous healing by electrical stimulation: Degenerate electrical wave form down regulates inflammation, up regulates angiogenesis and advances remodelling in temporal punch biopsies in a human volunteer study* by Anil Sebastian; Farhatullah Syed; **Donna Perry**;

Upcoming Seminars

Monday 28 November 12:00h

MIB Lecture Theatre
MIB International Seminar Series
Prof. Volker Deckert
Institute of Physical Chemistry, Jena University
Can Submolecular Resolution be Achieved by Raman Spectroscopy?

Thursday 29 November 19:00h

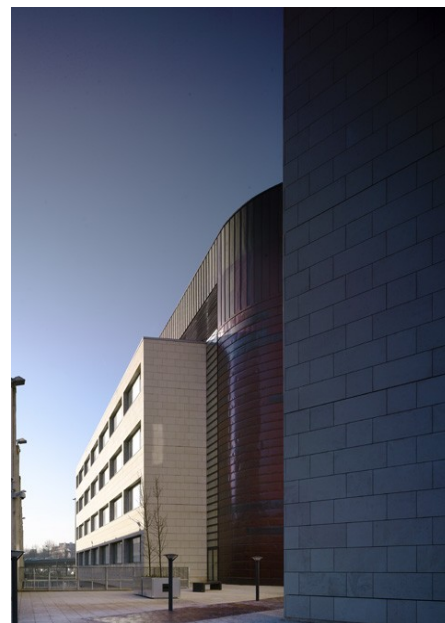
Great Hall, Sackville St Building
Event organised by Dr. Gerold Baier, Deputy Director, **MCISB DTC**
"Stunning data visualization in the AlloSphere"
The AlloSphere - Public Event with 3D animation
JoAnn Kuchera-Morin, University of California at Santa Barbara

You can watch her [TED talk](#) as a teaser:

Thursday 15 December 2011 12:00h

MIB Lecture Theatre
MIB International Seminar Series
Dr. Jean-Philip Piquemal
Laboratoire de Chimie Théorique, UPMC, Sorbonne Universités

If you have any events you wish to advertise in the MIB please contact **Chris Cowan**; 306 8713.



Upcoming Research Events

PhD Studentship Open Day

Wednesday 9 November at 13:00h

MIB Lecture Theatre

Application of Systems Approaches to Biologicals and their Production

Thursday 3 November

MIB Lecture Theatre

To register please visit the [website](#) or fill in the registration [form](#)

This free one day event will include keynote presentations on expression systems and systems biology approaches with sessions on:

- Automation of cell based assays and production platforms
- Large data set generation associated with automation
- Progressing, integration and interpretation of multiple, large, data sets.

Bruker Scanning Probe Microscopy Conference and Users' Meeting

MIB Lecture Theatre

Wednesday 23 November Conference

Tuesday 22 November Workshop

For further information and

registration please see [website](#)

- Presentations from leading academic and industry researchers
- Optimize your skills in Practical Workshops
- Probes draw: £ 1,000 of AFM probes to be won!

Thursday 8 December

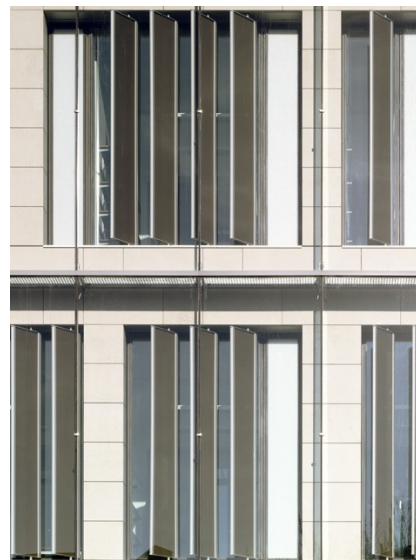
Symposium on Imaging Mass Spectroscopy

To include talks by [Prof Ron Heeren](#), AMOLF, Amsterdam; [Prof Chris Grovenor](#), Department of Materials, University of Oxford; [Dr Torsten Henkel](#), SEAES, University of Manchester

For further details see the web-site for MassSpectrometry@Manchester <http://massspecmanchester.org/>

'The MIB promotes a culture of collective and shared values within which the contribution of each individual to the MIB is fully recognised. Inclusivity and tolerance will be advocated, and a climate of participation, collegiality, co-operability and team-working is embraced.'

Extract from the Strategic Plan of the MIB, September 2010



Publications

Hayes F, Van Melderen L (2011) Toxins-antitoxins: diversity, evolution and function. Crit. Rev. Biochem. Mol. Biol. 46:386-408. [Paper](#)

Joanne M. Foulkes, **Kirk J. Malone**, Victoria S. Coker, **Nicholas J. Turner**, and Jonathan R. Lloyd (2011) Engineering a Biometallic Whole Cell Catalyst for Enantioselective Deracemization Reactions. ACS Catal., **2011**, 1, pp 1589-1594 [Paper](#)

Kolluru, B., Nakjang, S., Hirt, R. P, Wipat, A. and Ananiadou, S.. (2011). **Automatic extraction of microorganisms and their habitats from free text using text mining workflows**. In: Journal of Integrative Bioinformatics, 8(2), 184 [Paper](#)

Wang, X., Rak, R., Restificar, A., Nobata, C., Rupp, C. J., Batista-Navarro, R. T. B, Nawaz, R. and Ananiadou, S.. (2011). **Detecting Experimental Techniques and Selecting Relevant Documents for Protein-Protein Interactions from Biomedical Literature**. In: BMC Bioinformatics, 12(Suppl 8), S11 [Paper](#)

Dunn WB, Goodacre R, Neyses L, Mamas M. (2011). Integration of metabolomics in heart disease and diabetes research: current achievements and future outlook. Bioanalysis. 2011 Oct;3(19):2205-22. [Paper](#)

Popelier PL. Fully Analytical Integration Over the 3D Volume Bounded by the β Sphere in Topological Atoms. J Phys Chem A. 2011 Oct 6. [Epub ahead of print] [Paper](#)

Ashton L, Lau K, Winder CL, Goodacre R. 2011 Raman spectroscopy: lighting up the future of microbial identification. Future Microbiol. 2011 Sep;6:991-7. [Paper](#)

Jones AR, Hardman SJ, Hay S, Scrutton NS. 2011 Is There a Dynamic Protein Contribution to the Substrate Trigger in Coenzyme B(12) -Dependent Ethanolamine Ammonia Lyase? Angew Chem Int Ed Engl. 2011 Sep 22. [Epub ahead of print] *No abstract available*.

Health and Safety Office

Focus on...Housekeeping

These pictures were all taken during the annual lab inspections, and identified poor housekeeping in many areas of MIB.

We do not want to see this on this years inspection!

Good housekeeping is essential to ensure a clean, safe and pleasant work environment. Lack of good housekeeping is associated with accidents and fires, and also reduces work efficiency.



Storage at height



equipment stored on the floor



obstructed under-benches



Cluttered fume cupboards



open solvent containers on the open bench



cluttered benches

For a safe and healthy workplace, it is imperative that good housekeeping practices are employed. Please make sure that you:

- Label all of your items – particularly important when using communal cold rooms, etc
- Move equipment away when you are not using it
- Remove waste – such as halogenated-waste containers – regularly Report problems – such as broken equipment – so that it can be fixed

Contact : Dr. Tanya Aspinall, CMIOSH DipNEBOSH MIIRSM MISTR

MIB Safety and Risk Manager, Room 3.027; 306 5187

STDU safety training courses

STDU H&S courses are run in the Sackville Street Building, close to MIB. They are available, free of charge, to all staff and research students. This courses can be viewed and booked [online](#)

Date	Course Code	Course title
17/11/11 and 05/12/11	HS42	Laser training
17/11/11 and 05/12/11	HS98	Laser awareness training
22/11/11	HS7, HS7A and HS7B	Gas safety and regulators course – compressed gases workshop; cryogenic gas user workshop; practical session workshop

Garside Building News

Atrium film

Good news! – at long last the solar film will be installed onto the atrium windows, 31st Oct – 4th November. There should be minimal disruption to MIB as the film will be attached to the outside of the windows. However, this does mean that adverse weather conditions could delay or slow the works down.

Front door replacement

Works scheduled to finish on Friday 4th November (fingers crossed!).

Podium steps

Scope of works established and work ongoing. Contractor to commence investigations regarding rainwater leaks from the podium.

Any issues regarding the building please email:
MIB-PROBLEM@listserv.manchester.ac.uk

The architecture of the MIB reflects the needs of interdisciplinary science, featuring open-plan, multifunctional laboratories and a wide range of high-tech facilities.

MIB Christmas Party—Friday 16 December 2011 from 3.00pm

Entrance Tickets £3.50 Raffle Tickets £1.00 for 5

Raffle prizes to include a Kindle, Ipod Nano and Amazon Vouchers

We are delighted to confirm that the MIB will subsidise the Christmas Party by way of drinks and entertainment. We will have music at the party, raffle prizes and entertainment. The more entry and raffle tickets we can sell the more food and drink we can supply. Financial times may be difficult but the MIB Christmas Party is a great bargain and always enjoyed by all. Arrangements have been made for the party to continue in Harry's Bar—although it won't be a free bar!



Your input into the 'entertainment' is required so feel free to let me have any ideas by [email](#). So far, we have had requests for a return of the Sumo Santas and inflatable table football!

If you are interested in sitting on the organising committee or if you are happy to help out on the day please let me know.

Marketing and Communications Committee

Marketing and Communications Committee

Branding, Identity, Communications and Public Engagement

MIB Council has approved and welcomed the development of a Marketing and Communications Committee. The Committee is tasked with raising the profile of the MIB both internally and externally by researching and advising on the MIB 'brand'; exploring ideas for marketing the MIB through a variety of marketing tools and media that will excite, motivate and unify members behind a new revitalised strategy. This will include networking events, open days (public engagement), newsletters, website, exhibitions etc. We are very keen to have a cross section of staff and students on this panel. If you are interested in sitting on this Committee and contributing to the development of the MIB's profile and outreach activities or would like to discuss this further please contact [Lesley-Ann Miller](#). Comments, of course, are always welcome!



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Manchester Interdisciplinary
Biocentre
Garside Building

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MIB NEWSLETTER
November/December 2011

Communication within the MIB is based on a variety of different means and strategies:

Plasma screens provide visual reminders of events and other notices which can also be viewed by visitors to the MIB

Research Newsletter – share good news, achievements, details of upcoming events, training, funding opportunities and publications. Scope to include 'Building Issues/Updates' section. Issued monthly.

Committees - a variety of documents are regularly produced each with specific aims and areas of focus.

Open Meetings

Research Seminars occur most weeks and cover a broad range of research fields. Email notification weekly and on day of seminar.

Research Events occur throughout the year and cover a broad range of research fields

Publicity Materials have been developed to help raise the MIB's profile outside the University and include the Research Brochure

Email – various email groupings – mib-problem; mib-PI, mib-research, mib-everyone, mib-clerical

Everyone has a role to play in effective communication and all staff are encouraged to make active use of the established means of communication above or to send comments and suggestions to [Lesley-](#)

