

M&FMB Technology Transfer project

Progress Report: February 2003

Background

The NERC Marine & Freshwater Microbial Biodiversity (M&FMB) thematic programme has as one of its specific goals:

“To develop fundamental research to a point at which industrial investment and exploitation is possible”

Following the first M&FMB Annual Conference in July 2001 it was suggested that to help achieve this goal a dedicated Technology Transfer project be established. This culminated in the placing of a one-year contract, through Oxford University, with the FIRST Faraday Centre (Faraday for Innovative Remediation Science and Technology) to undertake such work. The project is overseen by Professor Chris Knowles, Director of FIRST and Professor of Environmental Biotechnology at Oxford, with the main activity being undertaken by Dr Dave Woodward (an independent consultant working through FIRST under contract to the University) working in close collaboration with Dr Phil Williamson, the M&FMB Science Coordinator, and drawing on the expertise of other colleagues in FIRST as appropriate.

The contract was placed by NERC in August 2002 and launched at the 2nd M&FMB Annual Conference at Plymouth in September, where Dave Woodward gave a presentation on the purpose of the work and an outline of the planned approach. Three broad phases of the work were originally envisaged:

- 1) Establishment of a confidential framework in which to exchange information. Initial information gathering and synthesis, largely from within the project, through review of proposals, project reports and - most importantly - face-to-face meetings with a wide range of PIs and other key people involved with the programme. The intended output from this activity is a clear and accessible summary of the programme from an ‘exploitation potential’ perspective, with prospective ‘end users’ of the research in mind and with particular emphasis on appeal to UK industry
- 2) Engagement with relevant third parties (eg. potential ‘partners in exploitation’) to establish interest in the work of the programme and the capabilities of the teams involved, to help identify specific opportunities for exploitation and to explore (business) models for taking opportunities forward (these might range from further commissioned and collaborative research through IP licensing and possibly to business plan development for start-up/spin-out companies) Small workshops involving programme representatives with participants from industry were seen as a key part of this phase of activity
- 3) Preparation of a Final Report summarising the potential exploitation opportunities identified, any progress to exploitation achieved and recommendations for overall future direction and specific projects, as appropriate.

Progress to date

A framework for confidential exchange of information during the information-gathering phase of the project has been established through the contract conditions placed on Oxford University by NERC and embodied in the contract between Oxford University and Dr Woodward. Any confidential exchanges between the programme and other potentially interested third parties will need to be handled on an *ad hoc* basis and are likely to be based on the standard existing formats of the parties concerned.

Work to date has concentrated on gathering and evaluating information from within the programme. In addition, some preliminary contacts and awareness-raising with potentially relevant external organisations and individuals have been achieved through attendance at the Rothamsted Biomarket and Pro-Bio Faraday annual conference in November, and through other opportunistic meetings.

Between September 2002 and January 2003, Woodwark and Williamson met representatives of the majority of the projects currently supported under the M&FMB programme and a number of the Steering Committee members. There are a few meetings of this sort outstanding and the intention is to complete them by the end of March. The meetings have all aimed to cover the following topics:

- A simple description of the scientific goals of the research and their broader significance, in terms accessible to a lay audiences
- A clear understanding of the (direct or indirect) technological/commercial potential of the work
- A summary of the current "Capabilities, Assets and Relationships" of the project team (e.g. domain/level of expertise, IP portfolio, existing collaborations with industry)
- Current approach to IP management within the team and relevant organisation
- An understanding of what would be useful to the project in terms of workshops or developing specific contacts to progress "next step" activities
- Specific actions

A standard meeting summary/feedback form has been prepared and individual meeting summaries will be iterated with participants prior to a workshop on Programme Presentation Development planned for March. The format for these summaries is given at [Annex 1](#), and a listing of the project-level meetings held to date is given at [Annex 2](#).

Across the programme as a whole, preliminary review identified a number of areas as worth exploring for exploitation potential, including:

- Biodegradation/bioremediation
- Biocatalysis/biotransformation (novel enzymes – functionality/properties)
- Cell-cell signalling and sSensors (e.g. novel luminescence mechanisms)
- DNA/RNA molecular biology/genomics/proteomics
- Viruses (role in pathogenicity/horizontal gene transfer)
- Bioprocesses (e.g. single cell bioreactors)
- Biomaterials/biostructures and bioproducts (novel fermentation products and secondary metabolites)
- Biodiversity – novel isolation methods

Discussions to date have confirmed capability in many of these areas. However, that capability is further removed from specifically identifiable products and/or processes than originally envisaged, when it was expected that effort would focus on the following 'commercialisation' questions and issues:

- What *exactly* is the *commercial opportunity*?
- Potential *market size/routes to market*
- State of *development* of the *technology*
- Status of the *intellectual property*
- 'Gap Analysis'-what's needed to turn the science into a business (Capabilities/Assets/Relationships)
- *Competing and complementary technologies*

Although still useful, some of these questions were felt to be premature for some projects. Thus they have been augmented by such questions as:

- *Where else/to whom might your know how and methodologies be relevant?*
- *Do you have specific organisms/isolates that should be screened for commercial application?*

From discussions to date it would appear that there is very little, if any, protected Intellectual Property being generated specifically by the M&FMB programme. In general there is a good appreciation of intellectual property management issues and the local processes for registering and exploiting it are well understood by the various PIs in their respective universities and institutes. However, the prevailing culture is one of 'Publish and Present' rather than 'Protect and Exploit' – perhaps unsurprisingly given the fundamental nature and primary purpose of the research and the usually applied metrics (primarily peer reviewed publication record) for judging success.

So exploitation - at least in the short-medium term – is, in general, unlikely to be through the patenting and licensing of IP or the establishment of start-up/spin-out companies. It is more likely to progress through engagement and collaboration with third parties based on their recognition of the benefit of having access to high calibre know-how, in depth expertise and relevant R&D methodologies honed to tackling scientific problems relevant to their needs (e.g. 'culturing the unculturable', novel DNA identification and manipulation, complex system understanding and optimisation...) These are the strengths that the programme is underpinning and has to offer to a wider field of potential exploitation partners.

Many of the discussions to date have brought out that a significant potential asset of the programme, with many of the projects contributing, is the collection of novel organisms and isolates generated. In many instances, it is felt that these may have significant commercial potential. But there is limited scope within the programme for screening with all such potential in mind. There is also a widespread feeling that, although 'safe' in the short term, the medium and longer-term curation of many of the new and novel cultures generated is not satisfactorily secure. Whilst relevant to it, this is an issue far broader than the impact on commercialisation potential of the M&FMB programme. Nevertheless, it is widely felt that a workshop under the auspices of the M&FMB TT project would be worthwhile and this has been factored into our plans.

A brief outline of the approach being taken in the M&FMB programme to exploring exploitation potential and the progress to date was presented to Mike Tricker and some of his colleagues at NERC in January. The approach was endorsed and it was agreed that, through establishing this Technology Transfer project, the formal requirement on Thematic Programmes to establish an exploitation policy and plan had effectively been discharged. The issues around IP management were discussed and it was indicated that NERC would be increasingly encouraging towards IP generation and exploitation. Interactions with BBSRC were recognised as important in this context, and BBSRC representation on the M&FMB Steering Committee is very helpful in this regard.

Comments from an exploitation potential viewpoint relating to applications for the final phase of M&FMB funding have been provided and it is clear that the current call has, as intended, elicited some proposals with an increased emphasis on exploitation.

Next steps

Having now met representatives of most of the M&FMB projects and developed some feeling for possible areas with exploitation potential, it is now timely to firm up the programme of small workshops that was originally planned as part of this TT initiative. As a first step, provisional dates have been booked for what will be one-day workshops (probably 10.30 for 11.00 start and finishing around 16.00 - 16.30, to allow most people to travel within the day) to be held at Swindon.

The planned dates are: 27 March, 15 April, 20 May and 24 June 2003.

We are envisaging about 12 participants in most of the workshops, but there is scope to accommodate up to 20 on the April date.

Preliminary thoughts are that the March workshop would be devoted to developing the "M&FMB Story" i.e. - what is it that the programme as a whole has to offer to a variety of potential "exploiters". The output from the workshop will be the presentational material that we shall then use to engage industry in future meetings and workshops; I would expect to come to the meeting with (a perhaps quite rough) first draft based on the discussions to date.

The April workshop is planned to cover culture collections issue referred to earlier and will aim to develop views on needs, potential lost opportunities and - most important - potential solutions to the perceived problem(s).

The May and June workshops would then be devoted to joint discussions with potential users of the programme's science, technology and expertise. Preliminary ideas are to have one devoted to environmental management aspects (including consultancy) and another to potential for industrial processes and products - but before any ideas are finalised, feedback from PIs and Steering Committee members will be taken into account. This feedback was sought in mid-January, along with an invitation to register interest in workshop attendance.

Involvement of the BBSRC community in these workshops would be welcome, particularly those on 15 April (culture collection issues) and on 20 May and 24 June (interactions with users, and other follow-up funding opportunities) - subject to the overall focus being the exploitation of M&FMB projects.

As well as workshops, presentation of the programme to a range of potentially interested research users will be pursued over the period March - July with the aim of establishing some specific relationships.

A final report on this phase of the work will be prepared and presentations made to the 2003 M&FMB Annual Conference and associated Steering Group meeting.

The current TT project will deliver only the first steps towards M&FMB programme exploitation and it will be worth considering how to take things forward thereafter. Further exposure of the programme to a broader range of potential users and exploitation partners would almost certainly be valuable and presentation of the programme, either as a whole or as a number of specific areas, at events such as the Rothamsted Biomarket 2003 would help in this regard. Experience with the Workshops engaging industry planned for the current TT project will also help to design a larger event dedicated to presenting the programme to a broad range of potential exploiters. More specific proposals in this area will form part of the Final Report on the current project.

The Steering Committee should be aware of the cost implications (c £35k) of continuing this TT project at a similar level of effort for a second year.

Dave Woodwark and Phil Williamson, January 2003

Annex 1

M&FMB Technology Transfer: Meeting Feedback Format

Meeting Date:	
Project(s)	
Participants	
Research Objectives	
Capabilities, Assets and Relationships	
IP Management	
Exploitation Potential	
Key Issues/Workshop Interests	
Actions/Next Steps	

Annex 2

Meetings with M&FMB programme and project representatives September 2002 – January 2003

Date	Venue	Participants (DW and PW attended all)
27 Sept 2002	Liverpool University	Jon Saunders; Don Ritchie
19 Nov 2002	Newcastle University	Mike Goodfellow and Alan Ward
27 Nov 2002	Warwick University	Nick Mann, Colin Murell, Dave Scanlan, Ian McDonald
5 Dec 2002	University of Kent	Alan Bull, Jem Stach
10 Dec 2002	PML Plymouth	Mike Zubkov & Peter Burkill, Michael Wyman & Clare Bird (Follow-on from AMBITION cruise review meeting)
11 Dec 2002	PML Plymouth (continued)	Ian Joint, Willie Wilson, Carol Turley, Carol Llewelyn, Dave Robins and several co- workers
13 Jan 2003	NERC Swindon	Helen Butler, Mike Tricker, Chris Miller, Stephen Loader
14 Jan 2003	Cardiff University	Adam Schultz & co-workers; John Fry, Andrew Weightman, John Parkes & Fiona Brock
21 Jan 2003	University of Essex	Dave Nedwell, Paul Thomas (Essex Univ. Business Development Manager – contact established through Rothamsted Biomarket)

Dates in late February/early March are currently being arranged for discussions with project groups and others not covered by the above.