

**EVALUATION OF BBSRC PLANT AND MICROBIAL SCIENCES COMMITTEE  
RESPONSIVE MODE PORTFOLIO**

**APPENDICES**

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## **APPENDIX 1**

### **PANEL MEMBERSHIP**

Professor Peter Gregory (Chair)	Scottish Crop Research Institute
Dr Steve Barnes	SESVanderHave, Belgium
Dr Mick Chandler	Centre National de la Recherche Scientifique, Toulouse, France
Dr Jens Freitag	Genius GmbH, Germany
Professor André Goffeau	Université Catholique de Louvain, Belgium
Professor Sophien Kamoun	The Sainsbury Laboratory, University of East Anglia
Professor Peter Millard	Environmental Sciences, Macaulay Institute
Professor Fergal O’Gara	National University of Ireland, Cork
Professor Ian Poxton	Centre for Infectious Diseases, University of Edinburgh
Professor Christine Raines	Department of Biological Sciences, University of Essex
Dr Alan Raybould	Syngenta
Professor Nicola Spence	Plant Health Group, Central Science Laboratory
Dr Jane Taylor	Department of Biological Sciences, Lancaster University
Professor Peter Weisbeek	Department of Molecular Genetics, Utrecht University, Netherlands
<b>Observer</b>	
Dr Sue Popple	Farming and Food Science, Defra

### **ACKNOWLEDGEMENTS**

The Panel would like to thank all of the respondents who gave their time to contribute to this evaluation. This includes Principal Investigators, Plant and Microbial Sciences Committee members and other funding organisations.

## APPENDIX 2

### TERMS OF REFERENCE

1. The task of the Review Panel is to carry out an independent scientific evaluation of the BBSRC Plant and Microbial Sciences (PMS) Committee responsive mode portfolio over the past 10 years. The Panel is asked to focus on the scientific aspects of the portfolio, including research outputs.
2. Specifically, the Panel is asked to review the information presented and to:
  - a. take an overview of the final reports and evidence from surveys to assess the quality and international standing of research funded through the PMS Committee
  - b. identify major highlights and, where possible, outcomes of the PMS Committee responsive mode portfolio over the past 10 years
  - c. in the context of research priorities in plant and microbial sciences research, and the availability of other support in the UK, assess the balance and coverage of the portfolio, identifying strengths and weaknesses
  - d. assess the economic and social impact of research supported by the PMS Committee including, where possible, contributions to the environment, human and animal health, relevant UK industrial sectors, and government policy
  - e. comment on the level of interaction between research supported by the PMS Committee and industry
  - f. comment on the level and quality of public engagement by PMS Committee grantholders
  - g. make recommendations to BBSRC on ways to build on successes and ways to address identified gaps and issues.

## **APPENDIX 3**

### **EVALUATION CONTEXT AND METHODOLOGY**

#### **Background**

1. BBSRC awards responsive mode research grants to unsolicited high quality research proposals from eligible applicants in any area relevant to the Council's mission. In the 2007/2008 financial year, BBSRC spent £143 million on responsive mode grants, which was approximately 38% of BBSRC research funding. Of this, 12% (£17.2 million) was spent on responsive mode research funded through the PMS Committee.
2. It is important to note that BBSRC also funds significant amounts of research through Institute Strategic Programme Grants (ISPG) made to BBSRC-sponsored Research Institutes. Some of this funding is for research that falls within the PMS Committee remit, particularly at the John Innes Centre, Rothamsted Research and the former Institute for Grassland and Environmental Research (now the Institute for Biological, Environmental and Rural Sciences). The Research Institutes and the research funded by ISPGs are evaluated every five years in the BBSRC Institute Assessment Exercise. ISPG-funded research is therefore not part of this evaluation.
3. All Principal Investigators (PIs) on grants are required to submit a final scientific report within three months of the completion of the grant. They are asked to report on progress against scientific objectives and to list publications and other outputs arising directly from the research supported by the grant. Final reports are peer reviewed and graded by two current or former Committee members, or by other specialist advisers.

#### **Evaluation objectives and methodology**

4. The objectives of this evaluation were to:
  - assess the quality and international standing of research funded through the PMS Committee
  - identify the major outputs and, where possible, outcomes of the PMS Committee responsive mode portfolio over the past 10 years: what difference has it made to the UK's scientific knowledge base and competitiveness?
  - identify strengths, weaknesses and gaps in the programme, the way it is structured, the influence of initiatives and priority areas on the way the programme has developed, and the way in which it is administered
  - in consultation with the research community and other relevant funding bodies (other Research Councils, government and non-government funding agencies), assess whether the PMS Committee is currently funding the most appropriate areas of UK bioscience
  - identify ways to build on successes, and ways to address identified gaps and issues.
5. The evaluation comprised a number of surveys, followed by a review of findings. The work was coordinated by BBSRC's Corporate Policy and Strategy Group, in consultation with BBSRC's Research Group. A logic chart was used to define the framework of the evaluation (see p. 56). The chart represents the objectives and the desired impacts of PMS Committee responsive mode funding, and places this funding in its wider context, showing its links to the longer-term aims of BBSRC.

## Surveys

6. Information was gathered from a range of sources:
  - **Completed grantholders:** 457 PMS Committee responsive mode grants which started between November 1996 and October 2006 and were completed and graded by the time the survey was carried out. A structured sample of approximately one quarter of these was taken, comprising 126 grants drawn from all of the years covered, and encompassing a representative proportion of final report grades. A questionnaire covering topics including success of the grant, outputs, outcomes, views on the coverage of the portfolio, and views on the operation of the Committee was sent to the Principal Investigators (PIs) of the sample grants. See Appendix 4 (p. 57) for questionnaires.
  - **Current grantholders:** A structured sample of just under half the current grants that have been active for more than a year, at the time of the survey, was taken, comprising 90 grants ranging from those at the end of their first year to almost completed grants. A questionnaire very similar to that sent to completed grantholders was sent to each PI.
  - **Grantholders who have received continuous support from PMS Committee:** In addition to completed and current grantholders above, a sample of seven individual PIs who had received continued support from PMS Committee responsive mode over the evaluation period were asked to fill in a questionnaire covering all their PMS Committee responsive mode grants.
  - **Committee members:** Current and former Committee members were sent a questionnaire covering topics such as coverage of the portfolio, the PMS Committee's achievements, and views on the operation of the Committee and BBSRC administration.
  - **Other relevant UK funding bodies:** A separate questionnaire was sent to other funding bodies with an interest in PMS Committee research in the UK, namely: the Department for Environment, Food and Rural Affairs (Defra), the Gatsby Foundation, the Wellcome Trust, the Medical Research Council (MRC) and the Natural Environment Research Council (NERC) The questionnaire covered potential overlap or gaps between remits, views on the appropriate niches for the two organisations, management of the Committee, and interactions with UK industry and the public.
  - **BBSRC data:** Relevant data were collated, including the final reports submitted by the sample PIs, and information from BBSRC grants database.

## Review of findings

7. Results were presented to a Review Panel. The Panel comprised independent experts who were not closely associated with BBSRC, but who are nevertheless familiar with the research in this area, and who between them have expertise across the PMS remit. The Panel included two members from industry and six international members.
8. The role of the Panel was to provide an independent scientific evaluation of the data presented, focusing on the scientific aspects of the portfolio. The detailed process aspects covered in the surveys (i.e. issues that are common to all of the Research Committees) will be combined with the process-related responses from other responsive mode evaluations and reviewed separately. It should also be noted that

financial and efficiency aspects are reviewed regularly as part of BBSRC internal audit procedures.

9. The Panel met for two sessions. To facilitate the analysis, the three 'impact' lines of the logic chart were divided into five subject areas:
  - research outputs and achievements
  - balance and coverage of the portfolio
  - interaction with industry
  - public engagement
  - economic and social impacts
10. This report was presented to BBSRC's Executive Team, who recommended that it should be considered by BBSRC Strategy Panels and acted on as appropriate. The report will also be made public on the BBSRC website and circulated to all those who returned questionnaires.

### Constraints

11. The survey data used in this evaluation relate to the samples described above. The samples of completed and current grants represent a random cross-section of the science supported through the PMS Committee, and covered 28% of completed grants and 47% of current grants at the time of the survey.

### INTRODUCTION TO THE PMS COMMITTEE

12. The PMS Committee was established in 1994 following the creation of BBSRC from a re-organisation of the Research Councils. BBSRC was created by the merger of the former Agricultural and Food Research Council with the biology and biotechnology programmes of the former Science and Engineering Research Council.
13. The table below summarises BBSRC spend in the PMS area over the past five years. The focus of this evaluation is the research in responsive mode, but it should be noted that a significant amount of support in the PMS area is through Research Initiatives and Institute Strategic Programme Grants to BBSRC-sponsored institutes.

Financial Year	03/04	04/05	05/06	06/07	07/08
PMS spend – Responsive mode (£ million)	16.2	15.8	16.6	16.6	17.2
PMS spend – Initiatives (£ million)	3.6	2.6	3.5	5.1	8.0
PMS spend – total (£ million)	19.8	18.3	20.1	21.8	25.2
Number of PMS responsive mode grants started <sup>1</sup>	80	77	63	57	64

<sup>1</sup> Number of grants includes responsive mode grants with a start date within the financial year

14. The science funded by the PMS Committee is defined by its remit, which is the overarching definition of the scientific responsibility of the Committee and is not generally subject to change or modification:

*The Plant and Microbial Sciences Committee supports integrative studies of physiology and biochemistry to gain an understanding of the way in which plants and microorganisms function in both terrestrial and aquatic environments.*

## Themes

15. Proposals for basic, strategic or applied research are invited on any topic within the remit. The remit is very broad and the Committee developed a themed description of its main activities to help the scientific and user communities to understand the major areas in which it operates. The themes are intended to be illustrative rather than exclusive.
- Control of gene expression and the action of gene products
  - Mechanism of plant growth and development
  - Photosynthesis, respiration and partitioning of resources
  - Microbial energy metabolism, solute transport and small molecule interactions
  - Biochemistry and physiology of micro-organisms
  - Interactions between plants and other organisms
  - Soil and rhizosphere biology
  - Form and function in plants and microbes
16. To show the distribution of the portfolio amongst the themes, the table below displays the value of PMS Committee responsive mode grants live on 31<sup>st</sup> October 2006 (the last day of the evaluation period).

Theme	Number of active grants <sup>1</sup>	Value (£M)
Control of gene expression and the action of gene products	54 (63)	13.0
Mechanism of plant growth and development	40 (41)	9.4
Photosynthesis, respiration and partitioning of resources	8 (13)	1.8
Microbial energy metabolism, solute transport and small molecule interactions	9 (10)	2.3
Biochemistry and physiology of micro-organisms	24 (36)	5.2
Interactions between plants and other organisms	34 (38)	9.7
Soil and rhizosphere biology	1 (1)	0.2
Form and function in plants and microbes	5 (5)	1.2
Other <sup>2</sup>	30	6.7
<b>Total</b>	<b>205</b>	<b>49.6</b>

<sup>1</sup> Some grants cover more than one theme. Only the main theme of each grant was used to determine the number of active grants in a given theme. Numbers in parentheses represent the total number of grants in a theme when grants' secondary themes are included.

<sup>2</sup> e.g. includes grants not in a specified theme and one systems biology grant (value £0.3M)

17. Within the PMS Committee remit there were specific areas of science called Priority Areas, in which the Committee particularly wished to encourage applications, for example, to address important gaps in the Committee's portfolio or to promote new/developing areas of science. If an application was within a priority area it would be funded preferentially to an application, that was equal on all other accounts, but was not in a priority area. Priority areas were modified and/or removed over time as their objectives were achieved.
18. The PMS Committee supported the following priority areas at the time of the evaluation:
- Comparative functional genomics
  - Crop science

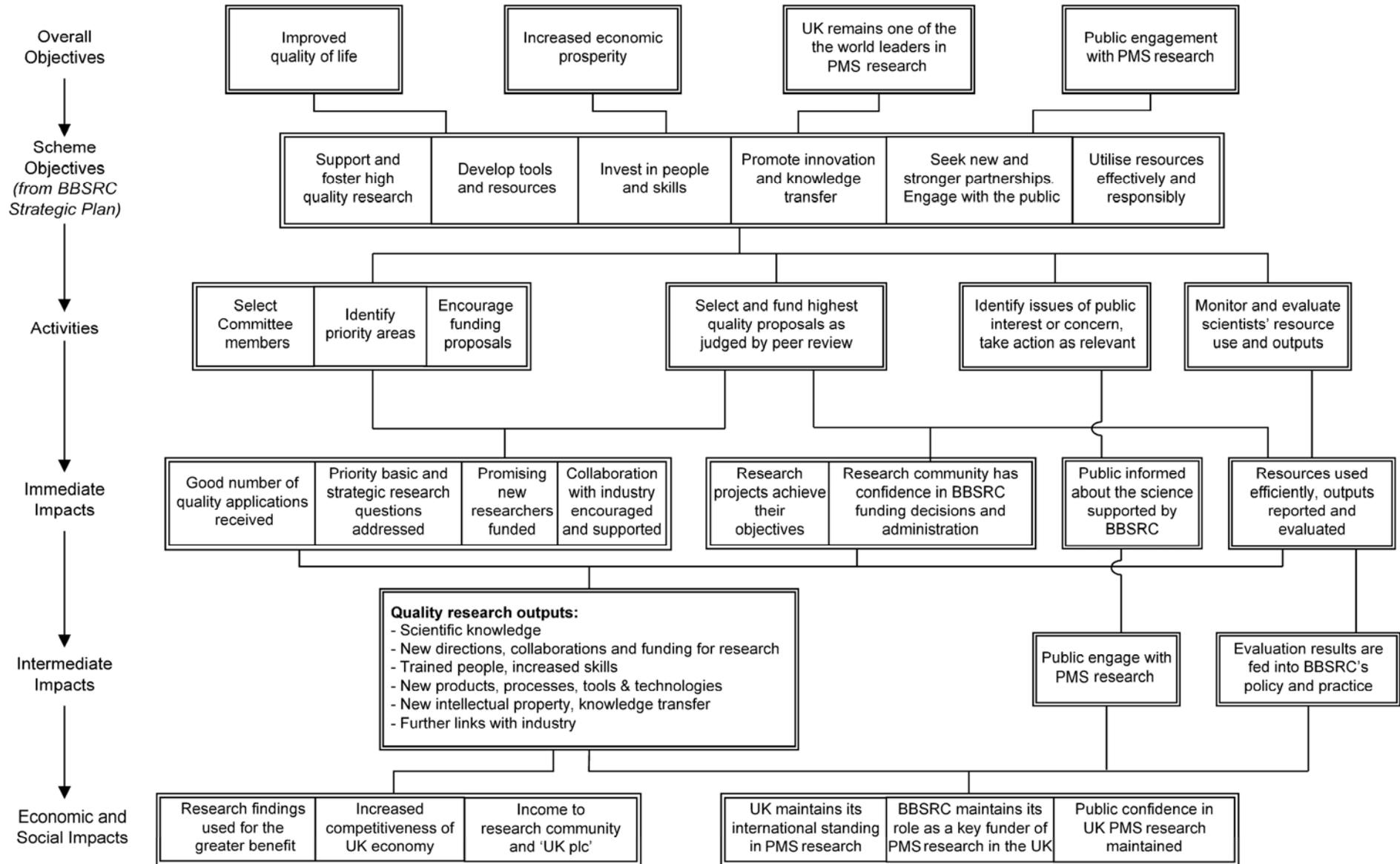
- Exploring the potential of metabolomics
  - Fossil carbon substitution: biomass to biosynthesis
  - Integrating physiology
  - Sensing and signalling systems
  - The cellular basis of multicellular function
19. BBSRC recognises that research is becoming increasingly multi- and inter-disciplinary and that some research areas are important to all Committees. At the time of the evaluation, BBSRC supported six Cross-Committee Priority Areas relevant to the PMS Committee remit:
- Bioinformatics and e-science
  - Biophysics
  - Bioscience engineering
  - Drug resistance and alternatives to chemotherapeutics
  - Technology development
  - Theoretical biology

### **Research initiatives and programmes**

20. BBSRC also runs Research Initiatives and Programmes, which provide time-limited research funding in areas identified as strategically significant. These are evaluated separately by BBSRC, and hence do not form part of this evaluation. However, they compromise important background information, as the science supported in initiatives often becomes an important area in responsive mode after the initiative has ended. Moreover, they are important components of the overall balance of funding across the PMS Committee remit.
21. The following initiatives were relevant to the PMS Committee remit during or since the evaluation period:
- Bioimaging
  - Bioinformatics and e-science Programme I&II
  - Bioinformatics II
  - Biological Interactions in the Root Environment
  - Bioprocessing Research Industry Club
  - Cells and Molecules ROPA
  - Centres for Integrative Systems Biology
  - Crop Science Initiative
  - David Phillips Fellowships
  - European Research Area Network in Plant Genomics
  - Follow-on Fund
  - Innovative Biological Imaging and Signal Analysis
  - Joint Equipment Initiative
  - Joint Infrastructure Fund
  - LINK: Agro-food Quality
  - LINK: Competitive Industrial Materials
  - LINK: Horticulture
  - LINK: Renewable materials
  - LINK: Sustainable Arable Production
  - LINK: Technology Foresight 1
  - Plant and Microbial Metabolomics
  - Prokaryotic Responses to Environmental Stress
  - Proteomics and Cell Function
  - Realising Our Potential Awards

- Resource Allocation and Stress in Plants
- Selective Chemical Intervention in Biological Systems I&II
- Sustainable Agriculture for International Development
- Tools and Resources Development Fund
- Transnational research projects on Systems Biology in Microorganisms
- UK Microbial Culture Collections
- Wealth Creating Products of Plants Initiative

## Logic Chart for Plant and Microbial Sciences Committee Responsive Mode Funding



## APPENDIX 4

### QUESTIONNAIRES

#### **BBSRC Plant and Microbial Sciences Committee Responsive Mode Portfolio Evaluation 2008**

Survey of Completed Grant Holders

Thank you for participating in the BBSRC PMS Committee responsive mode portfolio evaluation. Please complete as many questions as possible and return to Paul Reeves, preferably by e-mail, by **7th March**. An electronic version of this questionnaire will be sent to you in the next few days. If completing by hand, please feel free to continue your answers on a separate sheet.

Name:

Grant Ref:

Grant Title:

Please comment wherever possible. All responses will be non-attributable/anonymous.

#### **A: YOUR RESEARCH GRANT**

1. **How successful was the project supported by this grant in meeting its objectives?**  
(please mark one box)

4 (very successful)	3	2	1 (not successful)

If you marked 1 or 2, were the reasons for this related to:-  
(please mark all boxes that apply and comment if you wish)

Staff e.g. shortages, staff leaving	
Experimental/methodological/technical reasons	
Lack of resources, e.g. funding, equipment	
Unrealistic objectives	
'High risk' hypothesis	
Forced to change research direction (e.g. by publication of new data)	

Comments:

**2. How did this grant enable you to develop your wider research aims?**

(please mark all boxes that apply and comment if you wish)

Enabled extension of research into new areas	
Provided funding for activities that other bodies would not fund (e.g. 'blue skies' research)	
Enabled development of cross-disciplinary research	
Strengthened the skill base of the group (e.g. techniques, cross-disciplinary skills)	
Contributed to the development of tools and technologies	
Contributed to the development of resources for the research community	
Generated income from patents, spin out companies, etc to support further research	
Supported new/stronger collaboration with industry	
Strengthened the standing of your research group in the field	
Helped to publicise the importance of your field of research	
Other – please specify:	
Did not support my wider research aims	

Comments:

**3. Did the project have any co-funding or in-kind support at the outset (excluding Industrial Partnership Awards or LINK funding)?**

Yes	
No	

If yes, please give details:

**STAFF RECRUITMENT**

**4. Did you have major staffing difficulties during the grant?**

Yes	
No	

Comments:

**5. Do any of these statements describe your experience with recruitment for this grant?**

(please mark all boxes that apply and comment if you wish)

The grant had a named researcher from the outset	
I found it easy to recruit well qualified and experienced staff	
It was difficult to find someone with the necessary qualifications and experience	
I had to accept someone with significantly less experience than was needed	
I had to delay the start of the grant (e.g. I needed to re-advertise, I was waiting for visa clearance for an overseas candidate)	
There were no suitable UK candidates	
Staff left or temporarily stopped work during the grant, so I had to re-recruit	
I was lucky this time, recruitment is usually difficult	

Comments:

6. How closely did the skills of your Research Assistant(s) match the needs of the project? (please mark one box and comment if you wish)

<b>4</b> (close match)	<b>3</b>	<b>2</b>	<b>1</b> (significant training needed)

Comments:

### PRIOR AND FURTHER FUNDING

In order for us to place this grant in the wider context of the development of your research programme, please answer the following questions about prior and further funding.

7. Did this PMS grant continue or develop work from a previous grant?

Yes	
No	

If yes, please provide details (e.g. BBSRC committee or other funding agency)

8. Have you received a further grant from PMS to continue or develop the work funded by this grant?

Yes	
No	

If not, please tell us why? (please mark all boxes that apply and comment if you wish)

My research priorities have changed	
Applied to PMS but proposal was not funded	
Funding is more accessible from other sources (e.g. other BBSRC Committees, other Research Councils, other funding bodies) – please specify	
Other - please specify:	

Comments:

9. Have you received further funding related to this PMS grant from another funding body, including another BBSRC committee?

Yes	
No	

If yes, please provide details:

Funder (BBSRC Committee/ Other funding body)	Grant reference (BBSRC grants only)	Value(£) and Duration (months) (non-BBSRC grants)

## REGULATORY ISSUES

10. To what extent did regulatory procedures and ethical issues impact on the progress of the research? (please mark one box)

<b>4</b> (significantly)	<b>3</b>	<b>2</b>	<b>1</b> (not at all)

If you marked 3 or 4, please give details.

## **B: RESEARCH OUTPUTS AND OUTCOMES**

### **PUBLICATIONS**

11. What publishing strategy have you adopted for your research? (please mark all boxes that apply and comment if you wish)

Target high profile, multi-disciplinary journals (e.g. Nature, Science)	
Target the most appropriate journals for my area of science	
Target journals where I can get my results published quickly	
Target conference proceedings	
Other - please specify:	

Comments:

12. Is your publishing strategy influenced by having to produce a final scientific report for BBSRC within 3 months of completion?

Yes	
No	

Comments:

13. Please list all **further publications arising from the grant** since the final report was produced, including those that are 'in press' or accepted for publication, in the spaces below or on a separate sheet. Please identify (underline or in bold) authors employed on the grant (i.e. research assistants or technicians funded by the grant).

Please list publications in the following two categories, and ensure that the full reference is included (Author(s), Year, Title, Journal, Volume, and Page Numbers):

Original work reported in refereed journals

Others: (review articles, edited conference papers, book chapters and articles in popular magazines)

14. How many of these publications had co-authors based in industry and/or overseas?

Industry	
Overseas	

## DATABASE SUBMISSIONS

- 15. Please give details, including accession numbers, of DNA and protein sequences, protein structures and other large data sets that you have submitted to online databases as a result of this grant** (i.e. please include transcriptomics, proteomics, metabolomics, imaging and other long-term studies.)

## KNOWLEDGE AND ITS EXPLOITATION

- 16. Did any new products, processes, resources, tools or technologies result from this grant?** (e.g. collections, reagents, software, databases, methodology etc.)

Yes	
No	

If yes, please provide details where relevant:

Description of product, process, resource etc.	
Who are the (potential) users? For what purpose do (or will) they use it?	
How was/will it be made accessible to others?	
Does it have the potential to be commercially exploitable?	
What impact has it had on researchers and on the community as a whole?	
Is the resource still accessible and relevant, or has it been superseded by new technologies?	

- 17. Have you or your colleagues applied, or are you likely to apply, for any patents, licences or other form of intellectual property rights as a result of the research supported by this grant?** *Please note: Any information provided by you will be treated as confidential and will not be released into the public domain without your prior approval.*

Yes	
No	
Likely to apply	

If yes, please give details:

Type of IP	Has it been licensed to companies?	If so, has the licence yielded any income? (please give details with dates)

- 18. Have you or your colleagues established any spin-out companies from the research supported by this grant?**

Yes	
No	

If yes, please provide details:

Company name	Area of activity	Date established	Trading/dormant	Turnover		No. staff
				FY	Value	

**19. If you secured further funding to continue this work (from BBSRC or alternative source) did that funding yield any new products, processes, resources, tools or technologies?**

Yes	
No	

If yes, please give details, including the funding body and any patents/licences/other intellectual property:

**20. If, in the future, your work led to the possibility of interactions with the wider community, would you consider applying to BBSRC to fund this work?** (e.g. collaborative research with industry, commercialization, government policy formation)

Yes	
No	

If yes, what type of grant would you apply for?

IPA	
LINK	
Follow-on funding	
Other - please specify:	

If not please tell us why, and where you would look for funding?

**21. If the focus of this grant's research was model systems, has there been any knowledge transfer of the research?** (e.g. from models to crops, either during the grant or from subsequent funding from any source)

Yes	
No	
Model systems were not the primary focus of this grant	

If yes, please give details

### **C: RESEARCH IMPACTS**

The wider impact of science funded by BBSRC is of increasing importance (e.g. BBSRC must submit evidence of the impact of funds during Spending Review negotiations with the Department of Innovation, Universities and Skills). Please answer as many questions as you can and provide comments where possible. BBSRC is particularly interested in learning about the economic and social impacts of your research.

## PEOPLE

### 22. Please provide details of all staff employed on the grant:

Grade/Position (e.g. PDRA, Technician)	% Time spent on grant	Dates of apptmt: from - to (month/Yr)	First destination after this grant*		Second destination after this grant*		For RAs only:	
			UK	Over seas	UK	Over seas	Was this the RAs first postdoctoral position?	Was the RA named on the application?

\* Please indicate category in appropriate column:

**A** – Remained in my lab

**B** – Permanent academic elsewhere

**C** – Fixed-term academic elsewhere

**D** – Further training (excl. teaching)

**E** – Teaching or teacher training

**F** – Private sector, industry or commerce

**G** – Government or other public sector

**H** – Other employment

**I** – Not employed

### 23. If any student projects were running at the same time and on a similar topic to this grant please indicate:

	Number	Funding agency?	First destination/s after training*
Doctoral			
Masters			
Other – please specify:			

\* Please indicate category if known

**A** – Remained in my lab

**B** – Permanent academic elsewhere

**C** – Fixed-term academic elsewhere

**D** – Further training (excl. teaching)

**E** – Teaching or teacher training

**F** – Private sector, industry or commerce

**G** – Government or other public sector

**H** – Other employment

**I** – Not employed

## PARTNERSHIPS

### 24. Did any new collaborations or networks develop from this grant?

(please mark all boxes that apply and comment if you wish)

Outcome		✓	Details
New or improved <b>academic</b> <sup>1</sup> contacts	UK		
	Overseas		
New formal <b>academic</b> <sup>1</sup> research collaboration (e.g. joint publication, joint funding application)	UK		
	Overseas		
New or improved <b>industrial</b> <sup>2</sup> contacts	UK		
	Overseas		
New formal <b>industrial</b> <sup>2</sup> research collaboration (e.g. joint publication, joint funding application)	UK		
	Overseas		
Other (please specify)			

<sup>1</sup>if cross-disciplinary, please specify which discipline;

<sup>2</sup>please specify industrial sector (e.g. pharmaceutical, agrichemical)

Comments:

## WIDER BENEFITS TO THE PUBLIC GOOD

**25. Did the research supported by this grant result in outcomes of benefit to the public good?** (please give details where appropriate)

Human health	
Animal health and welfare	
Environment	
Contribution to the formulation of government policy, or meeting government priorities (e.g. reduction, refinement and replacement of animals in experiments)	
Other – please specify:	

## PUBLIC ENGAGEMENT

**26. Please indicate the public engagement activities you took part in during this grant?** (Please note: Public engagement activities are not required to be related to the grant awarded, but only list those that have occurred whilst the grant was active)

Activity	✓	Details <sup>‡</sup>
Public dialogue events		
Attending university open days		
Organizing* activities in universities		
Attending activities at schools		
Organizing* activities in schools		
Publicity in the general non-scientific media		
Responding to media inquiries		
Information technology activities (excluding departmental and PI websites)		
Other (please specify)		

\*i.e. taking a pro-active role in their planning and organization

<sup>‡</sup> Please provide details of any activity you feel is of particular interest or merit

**27. Have you ever applied for funding for public engagement activities or attended a BBSRC media training course?**

	Yes	No	Plan to in the future
I have applied for funding for public engagement activities (e.g. within a responsive mode grant, from BBSRC/RCUK programme etc.)			
I have attended a BBSRC media training course			

Comments:

**28. Do any of these statements describe your views or experience with public engagement?** (please mark one box for each statement)

Statement	Agree	Neutral	Disagree
My public engagement activities help shape how I take my research forward			
My public engagement activities help to inform the public about science and scientific issues			
My public engagement activities help in recruiting/encouraging the next generation of scientists			
Public engagement obligations are a distraction to achieving my research goals			
I lack the necessary training to engage effectively with the public, especially with issues of public concern e.g. ethical issues			
I am aware of examples of "best practice" in public engagement			
Public attitudes and interests should be considered and used to inform BBSRC policy formation and funding decisions			
Public engagement is an important aspect of a RAs training			

Comments:

**D: THE PMS COMMITTEE**

**29. What is/are your primary and secondary areas of expertise?**

(Mark one or more classification in each section. Write '1' for primary and '2' for secondary areas of expertise)

Bacteria		Plants	
Fungi		Protozoa	
Microalgae		Viruses	

Bacteriology		Photosynthesis	
Biochemistry		Physiology	
Biodiversity		Plant Breeding	
Biofuels / Bioenergy		Plant-microbe interactions	
Bioinformatics / eScience		Plant-pathogen interactions	
Biotechnology		Proteomics	
Cell Biology		Response to Environment / Stress	
Crop Science		Sensing and Signalling	
Extremophiles		Soil Science	
Fermentation		Systems Biology	
Genetics		Theoretical Biology	
Genomics / Functional Genomics		Transcriptomics	
Growth and Development		Virology	
Metabolism / Metabolomics		Other (please specify)	
Mycology			

- 30. Do you think your area of research has been well supported by the PMS Committee?** (please mark one box and comment if you wish)

<b>4</b> (very well)	<b>3</b>	<b>2</b>	<b>1</b> (not at all well)

Comments:

- 31. Are there any areas in the PMS remit that BBSRC should be covering but is not?**  
(details of the current PMS remit can be found at:  
[http://www.bbsrc.ac.uk/funding/grants/plant\\_microbial/index.html](http://www.bbsrc.ac.uk/funding/grants/plant_microbial/index.html))

- 32. Are there any areas in the PMS remit that the BBSRC is supporting too much?**

- 33. Do you have any comments on the operation of the PMS Committee?** (e.g. remit, themes, Priority Areas)

- 34. What is your opinion of the PMS grants application/administration processes?**  
(please mark one box and comment if you wish)

<b>4</b> (very effective)	<b>3</b>	<b>2</b>	<b>1</b> (not effective)

Comments:

- 35. Do any of these statements describe your experience with the PMS grants application and administration processes?** (please mark one box for each statement)

	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>
The application form is too long			
The use of Je-S has improved the submissions process			
The time from submission of proposal to decision is too long			
There is too little time to respond to reviewers' comments			
The feedback on unfunded proposals is sufficient			
More high quality but unfunded applications should be encouraged to resubmit with appropriate changes			
The final report is too long			
BBSRC staff are helpful and efficient			
The process is transparent			
It is helpful to have more than two funding rounds each year			

Any additional comments:

**36. To what extent was the scope and format of your application affected by your perception of any of the following:**  
 (please mark one box in each row)

	<b>4</b> (significantly)	<b>3</b>	<b>2</b>	<b>1</b> (not at all)
PMS funding schemes and policies				
PMS remit				
Application form				

Comments:

**37. What is your opinion on the refereeing process?** (e.g. quality, helpfulness of referees' comments)

<b>4</b> (very effective)	<b>3</b>	<b>2</b>	<b>1</b> (not effective)

Comments:

**38. How could BBSRC increase the number and quality of referees' comments?**

**E: GENERAL**

**39. Do you have any other comments relevant to this evaluation?**

*Thank you, your contribution is much appreciated.*

# BBSRC Plant and Microbial Sciences Committee Responsive Mode Portfolio Evaluation 2008

Survey of Current and Past Committee Members

## THE PMS REMIT

1. During your period of service, to what extent do you think the PMS remit was covered by the portfolio? (please mark one box and comment if you wish)

4 (well covered)	3	2	1 (poorly covered)

Comments:

2. Are there gaps or areas of inappropriate overlap between:

	Yes	No
PMS and other BBSRC committees?		
PMS and other UK funders in this area?		

Comments:

3. Have any scientific areas/opportunities been missed by PMS in recent years?

Yes	
No	

If so which ones, and why do you think they were missed?

4. During your period of service, how well do you feel the expertise of the Committee matched the remit of PMS? (please mark one box and comment if you wish)

4 (well matched)	3	2	1 (poorly matched)

Comments:

5. During your period of service, how well do you feel the expertise of the Committee matched the applications received and the applications that were funded? (please mark one box for each item and comment if you wish)

	4 (well matched)	3	2	1 (poorly matched)
Received applications				
Funded applications				

Comments:

6. What is your opinion about the balance between PMS-funded research on plant sciences compared with microbial sciences? (please mark one box and comment if you wish)

5 Too biased towards plants	4	3 Balance is appropriate	2	1 Too biased towards microbes

Comments:

7. **What is your opinion about the balance between PMS-funded research on model systems and economically/strategically important systems?** (please mark one box and comment if you wish)

5 Too biased towards model systems	4	3 Balance is appropriate	2	1 Too biased towards applied systems

Comments:

8. **What have the Committee's key achievements in terms of supporting the plant and microbial sciences community been?** (In other words, what difference has the Committee made?)

### **ECONOMIC AND SOCIAL IMPACTS OF PMS RESEARCH**

9. **Who are the end users of the PMS-supported research, tools and resources (including databases), and what are the long-term outcomes?**
10. **What do you think are the most significant economic or social impacts made as a result of PMS supported-research over the past decade?**
11. **How successful has the PMS committee been in supporting knowledge transfer? e.g. from models to crops** (please mark one box and comment if you wish)

4 (very successful)	3	2	1 (unsuccessful)

Comments:

12. **Which areas of basic research funded by PMS have subsequently become strategically important for the UK?**
13. **What comments, if any, do you have on the training, and number of skilled scientists in areas relevant to the PMS Community in the UK?**
14. **Has the research supported by PMS contributed to the reduction, refinement and replacement of animals in experiments?** (If so, to what extent. Please give examples)

Yes	
No	

Comments:

15. **Do you think there is sufficient engagement between the PMS research community and the public?**

Yes	
No	

If yes, please describe any particularly memorable examples.  
If not, how could this be improved in the future?

**16. What is your opinion of the current level of interaction between BBSRC and government departments in terms of policy making?** (e.g. with Department for Innovation, Universities and Skills)

**INTERACTION WITH INDUSTRY**

**17. What is your opinion of the current level of interaction between BBSRC-supported plant and microbial sciences researchers and industry?**  
(please mark one box and comment if you wish)

4 (very good)	3	2	1 (poor)

Comments:

**18. What changes have you seen in industrial-academic interactions over the past decade, and what are your opinions of these changes?**  
(please mark one box for each area and comment if you wish)

Area of science	5 Strong Improvement	4	3 No change	2	1 Strong decline
PMS-funded research					
PMS-remit (including research not funded through PMS)					

Comments:

**19. What are the barriers to interactions between industry and academia? How do you think BBSRC could encourage further interactions?**

**PROCESS AND MANAGEMENT**

**20. How well do you think the Committee meetings are structured?**  
(please mark one box and comment if you wish)

4 (very well)	3	2	1 (poorly)

Comments:

**21. How effective is the current refereeing process?**

(please mark one box and comment if you wish)

4 (very effective)	3	2	1 (not effective)

Comments:

**22. How might BBSRC address the well known problem of the burden of the peer review process, without jeopardising the quality of funded research?**

**23. Do you have any other comments on the BBSRC grant appraisal process (including its management and the rank ordering process)?**

**24. Do you feel that the PMS Committee works well as a team in reaching conclusions?**

(please refer to your period of service)

Yes	
No	

Comments:

**25. What is your opinion on the provision of PMS Committee meeting papers by BBSRC?**

(e.g. format, media, length)

4 (very good)	3	2	1 (poor)

Comments:

**26. How helpful are the BBSRC office staff?**

(please mark one box and comment if you wish)

4 (very helpful)	3	2	1 (not at all helpful)

Comments:

**27. What are your views on the BBSRC management of the grant system as a whole?**

**GENERAL**

**28. What do you think are the most important functions of the BBSRC Committees? Do you have any comments on their role within BBSRC?**

**29. Do you have any other comments relevant to this evaluation?**

*Thank you, your contribution is much appreciated.*

## **ANNEX 1: INTERACTION WITH INDUSTRY**

Additional questions for industrial Committee members. Information about BBSRC's interactions with industry can be found on the BBSRC website (<http://www.bbsrc.ac.uk/business/index.html>) should you require it.

### **30. What is your perception of plant and microbial sciences research in the UK?**

(e.g. Is it internationally competitive? Is it a growing sector? Is it appropriate to the needs of the end user?)

### **31. What is your view of the portfolio of BBSRC-funded plant and microbial sciences research in the UK?** (e.g. the balance between fundamental and strategic research)

### **32. Does your company currently invest in the bioscience research?**

Yes	
No	

If yes, is research carried out internally or by an outside organisation/s (please give details)?  
If not, is there a specific reason/s for this?

### **33. What is your opinion of the current level of interaction between BBSRC-supported plant and microbial sciences researchers and industry?**

<b>4</b> (very good)	<b>3</b>	<b>2</b>	<b>1</b> (poor)

### **34. What changes have you seen in industrial-academic interactions over the past decade and what are your opinions of these changes?**

(please mark one box for each area and comment if you wish)

<b>Area of science</b>	<b>5</b> Strong Improvement	<b>4</b>	<b>3</b> No change	<b>2</b>	<b>1</b> Strong decline
PMS-funded research					
PMS-remit (including research not funded through PMS)					

Comments:

### **35. Are you aware of the ways in which BBSRC funds collaborative projects between academia and industry?**

Yes	
No	

If yes, with which schemes are you familiar?

**36. Has your company collaborated with BBSRC-funded researchers?**

Yes	
No	

If yes, please give a brief description of the experience  
If no, is there a specific reason/s for this?

**37. What are the barriers to interactions between industry and academia? How do you think BBSRC could encourage further interactions?**

**38. Please indicate what proportion of the scientists you recruit are from the following sectors:**

<b>Sector</b>	<b>%</b>
UK Academia	
UK Industry	
UK Public Sector	
Overseas Academia	
Overseas Industry	
Overseas Public Sector	
Other (please specify)	

*Thank you for completing this section. Your comments and information will be very useful.*

**BBSRC Plant and Microbial Sciences Committee Responsive Mode  
Portfolio Evaluation 2008**  
Survey of UK funders

**A: THE PMS REMIT**

1. **Does the Plant and Microbial Sciences Committee remit, and corresponding themes, adequately cover what you understand to be the responsibilities of the BBSRC in the PMS area?**

Yes	
No	

Comments:

2. **Do the Committee's priorities reflect your perception of the key research needs (as they relate to the BBSRC remit) in the plant and microbial sciences area?**

Yes	
No	

Comments:

3. **How does the PMS Committee remit compare with your remit in this scientific area? Are there any gaps, or areas of inappropriate overlap?**
4. **How well are the boundaries between the remits and responsibilities of the BBSRC, and of your organisation clearly defined?**  
(Please mark one box and comment if you wish)

<b>4</b> (very well defined)	<b>3</b>	<b>2</b>	<b>1</b> (poorly defined)

Comments:

**B: COVERAGE AND RESOURCES**

5. **Do you receive many proposals that you cannot fund because of a lack of resources, but that are within (or potentially within) the PMS remit?**

Yes	
No	

If yes, in which areas are these proposals?

6. **Do you receive many proposals that you cannot fund because they are outside your remit, but that are within (or potentially within) the PMS remit?**

Yes	
No	

If yes, in which areas are these proposals?

7. **Are there any areas relevant to your organisation and within the PMS remit that need more support in the UK?** Please specify.
8. **Are there any areas relevant to your organization and within the PMS remit where support is less critical?** (e.g. where there are many potential funders or where you feel the science is less important to the UK). Please specify.
9. **If you have the data to hand, what was your annual budget in the PMS area (or sub-area), and/or how many grants did you support in the last financial year for which data is available?**

Area	Budget		No. grants	
	Amount	Year	Ongoing Grants	New Grants

### **C: FUNDING PROCESSES**

10. **Until recently, the majority of BBSRC responsive mode grants involving academic research were 3 years in length and support one postdoctoral Research Assistant. Is this typical of the type of funding provided by your organization?**

Yes	
No	

Do you have any comments on this?

11. **Could funding organisations work together better to serve the PMS research community? If so, how?**
12. **Are there any barriers to collaborations between your organisation and the BBSRC in the PMS area?**

Yes	
No	

If yes, please give details

### **D: GENERAL**

13. **Do you feel that BBSRC PMS supported scientists engage adequately with the public?**

Yes	
No	

Comments:

14. **Do you have any other comments relevant to this evaluation?**

*Thank you, your contribution is much appreciated.*

## APPENDIX 5

### LIST OF SAMPLE GRANTS

#### Completed grants

Grant Reference	Principal Investigator	Title
P15168	Ainsworth C	Plant sex determination and programmed cell death
P17237	Amtmann A	Elucidating signalling pathways in plant K homeostasis on the basis of gene expression patterns
P15615	Arnold D	Excision and insertion of pathogenicity islands in <i>Pseudomonas savastanoi</i> : the <i>avrPphB</i> model
P18264	Atkinson HJ	RNAi as a basis for defining both nematode and plant genes involved in compatibility and to provide novel control
P11455	Baker NR	Role of reactive oxygen species in stress-induced signalling for APX2 gene expression in <i>Arabidopsis</i>
P11627	Barber MS	Characterisation of a light-dependent trans-cis isomerases involved in umbelliferone biosynthesis in pea
P10310	Bavoil PM	Molecular and genetic basis of type III secretion in <i>Chlamydia psittaci</i>
P12206	Blomfield IC	Control of fimbriation in <i>E. coli</i> in response to alanine, leucine and nitrogen stress
P15842	Bond PL	Determining metabolic and physiological features of an extremely acidophilic archaeon, <i>Ferroplasma acidarmanus</i>
P10964	Bowsher C	Regulation of starch synthesis
P09472	Boyd LA	Molecular identification of the genetic loci responsible for suppression of resistance in wheat
P13224	Bray CM	A molecular characterisation of peptide transport in barley
P11117	Brownlee C	Regulation of a calcium channel in relation to polarised growth of root hairs
P15114	Buchanan-Wollaston V	Functional analysis of senescence-enhanced regulatory genes
P15846	Buck KW	Molecular dissection of the replication of cereal yellow dwarf virus
BBSB10110	Butler CS	Microbial selenium cycling: characterisation of a novel membrane-bound selenate reductase
P06750	Caddick MX	Nitrogen metabolite signalling in <i>Aspergillus nidulans</i>
P13596	Callow JA	Molecular characterisation of a plant adhesive glycoprotein
P14626	Campbell M	Toward a novel approach to modify lignins in plants (stage II)
P12736	Casselton LA	The mating pheromones and receptors of <i>C. cinereus</i> ; a model system for studying G-protein-coupled receptors
BBSX00085	Challen MP	Molecular analysis and exploitation of the mating type genes of <i>Agaricus</i> species
P10321	Chater K	The Wbl protein family: its potential for wide-ranging insights into actinomycete biology
P13785	Clark IM	The expression and function of matrix metalloproteinase homologues in <i>Arabidopsis thaliana</i>
P11528	Cole JA	Nitrate reduction to ammonia by fermentative bacteria: major new roles for the periplasmic nitrate and nitrite reductases
P13843	Coleman MJ	Characterisation of the protein encoded by the <i>Arabidopsis</i> powdery mildew disease resistance gene RPW8.2
P09299	Cooper RM	Proteases as pathogenicity determinants of the cereal pathogen <i>Stagonospora</i> ( <i>Septoria</i> ) <i>nodorum</i>
P11357	Cuming AC	Expressed sequence tags for homologous recombination in the moss <i>Physcomitrella patens</i>
P08195	Cundliffe E	Transglycosylation and the production of novel antibiotics
P17832	Dalmay T	Identifying novel genes required for gene silencing in <i>Arabidopsis</i>

Grant Reference	Principal Investigator	Title
P09483	Dickinson M	Analysis of genes induced in wheat during compatible interactions with biotrophic fungi
P13228	Dixon M	Molecular analysis of Cf-2/Cf-5 disease resistance gene recognition specificity and function
BBA51065X1	Dixon RA	Mechanism of a nitric oxide sensor in Escherichia coli
P15704	Doerner P	Genetic dissection of nitrogen nutrient signalling networks in plant growth control
P15880	Doughty J	Characterisation of functional interactions between PCP-A class pollen coat proteins and the Brassica S-receptor complex
P16536	Dyer PS	Sexual Reproduction in Aspergillus and other Plectomycete Fungi
P07393	Dyson P	Physiological differentiation in submerged cultures of Streptomyces coelicolor
P16683	Easton AJ	Coupled translational termination and re- initiation of overlapping open reading frames
P17174	Edwards KJ	Functional genomics of maize leaf senescence
P17132	Fearn R	Analysis of RNA synthesis initiation by respiratory syncytial virus
P11446	Ffrench-Constant RH	Insecticidal Photorhabdus toxins as alternatives to Bt
P09559	Ford RC	Structural studies of the higher plant photosystem I complex using electron crystallography
P15151	Fricke W	Studies into the role of aquaporins for regulating water supply to growing leaf cells and partitioning in mature tissue
P12834	Fromm H	Ca <sup>2+</sup> /calmodulin signalling in the plant cell nucleus: analysis of a novel nuclear protein that binds calmodulin and DNA
P15056	Fry SC	Xyloglucan-pectin covalent bonding in the plant cell wall
P14516	Gallois PG	Role and function of caspase-like activity in the execution of programmed cell death in plants
P08244	Gasson MJ	Analysis and exploitation of genes for type b lantibiotic biosynthesis
P09315	Gilligan C.A.	The role of soil physical conditions within the pathozone on fungal infection and biocontrol
P12773	Gray JC	Plastid signalling to the nucleus
P08466	Green J	Biotrophy-related proteins specific to the intracellular hyphae of Colletotrichum lindemuthianum
P09465	Grierson D	Mechanisms of ripening control through ethylene signalling and gene regulation
P10244	Gull K	Shape and form in microbial cells: the structural basis for cell division in trypanosomes
P16424	Halford NG	Molecular basis of changes in resource allocation induced by antisense SnRK1 gene expression and environmental stress
P12786	Hall J	Nramps; potential transporters for essential divalent cations
P18575	Hardie KR	The function of LuxS and its cognate autoinducer in bacterial central metabolism
P13833	Hardie R	Host plant selection by aphids
P08503	Hawes C	Protein targeting and mobility in the plant secretory system
P16508	Hedden P	The physiological roles of gibberellin 20-oxidase isozymes in plant development
P15029	Hiscock SJ	Molecular basis of sporophytic self- incompatibility in Senecio squalidus
P15753	Hobman JL	Metal recognition and transcriptional activation by the CueR regulator
P14659	Hooks MA	Acetate regulation of plant metabolism and development through gene expression
P09422	Hopkins D	Decomposition of modified lignins
P13990	Horton P	Interaction between radiation conversion, photosynthetic acclimation and nitrogen acquisition in rice

Grant Reference	Principal Investigator	Title
P08362	Hussey P	Reorganisation of the actin cytoskeleton in plant cells: proteins that interact with the maize stimulus responsive actin regulating protein, ZmADF3
P07733	Johnston AWB	Iron uptake in Rhizobium: the role of a new two component regulator, fur, and of cytochrome c assembly in this process
P08459	Jones MR	Functional characterisation of mutants of the PufX protein from Rhodobacter sphaeroides
P13214	Kertesz MA	Genetics and biochemistry of novel sulphatases in Pseudomonas species
P19254	Kinghorn J	Revealing structure/function relationships of a high affinity nitrate transporter, Nrt A, by site-directed mutagenesis
P12837	Knox P	The function of structural domains of pectic polysaccharides in growth and development
P09460	Kruger NJ	Metabolic analysis of lactate dehydrogenase- deficient potato plants during anoxia
P09495	Leegood RC	Organic acid and sugar metabolism in tomato fruit
P18220	Leigh R	Discovery of genes controlling solute accumulation by random gene activation specifically in the stele of Arabidopsis
P18236	Leyser O	Identifying and characterising the function of novel guard cell signalling genes
P06689	Lillycrop K	The influence of host proteins on the expression of the herpes simplex virus immediate-early genes in sensory neurons
P10229	Lindsay JG	Molecular and biochemical analysis of the distinctive organelle-specific plant pyruvate dehydrogenase complexes
P15484	Lindsey K	Transcriptome analysis at the single cell level in embryonic cells of arabidopsis
P07790	Lopez Juez E	An analysis of chloroplast-nuclear signalling using a plastidic guard cells in Arabidopsis
P12741	Maathuis FJM	Cyclic nucleotide signalling and salinity in plants
P18099	McCready SJ	Functional analysis of UV repair genes in the halophilic archaeon Halobacterium salinarum
P09675	Mitchell W	The role of MtlR regulation of expression of the Clostridium acetobutylicum mannitol operon
P17158	Mithen R	Functional analysis of acetyl CoA/alpha-keto acid condensation genes in Arabidopsis, and their role in primary and secondary metabolism
P16510	Moller SG	Light signalling and intercompartmental communication between chloroplasts and the nucleus
P11956	Moore A	Structure-function studies of the plant alternative oxidase by site-directed mutagenesis
P06598	Mullineaux CW	Photosynthetic light-harvesting and its regulation in cyanobacteria
LKP13779	Murray JAH	Orchestrating cell cycle, cell growth and differentiation in Arabidopsis: the roles and targets of E2F transcription factors
P16453	Neill S	The function of histidine kinases during oxidative stress responses in Arabidopsis
P10969	Nimmo HG	Analysis of the expression and function of phosphoenolpyruvate carboxylase kinase genes from maize
P15038	Nixon PJ	Role of cytochrome b-559 in the protection and assembly of photosystem two
P06520	Oldfield C	Exploitation of metabolic diversity of the genus Rhodococcus
P18634	Packer H	Characterisation of biofilm development in Rhodobacter sphaeroides
P07874	Parker J	Functional analysis of a novel disease resistance signalling gene, EDS1, in Arabidopsis
P16729	Parkhill J	A complete genome sequence of Pseudomonas fluorescens SBW25

Grant Reference	Principal Investigator	Title
LKP10393	Parry MAJ	The role of extracellular enzymes in xenobiotic metabolism and uptake in plants
P15616	Peck S	Characterisation of Arabidopsis proteins rapidly phosphorylated after treatment with microbial elicitors
P13277	Phillips-Jones MK	Characterisation of the Reg signalling pathway in Rhodobacter sphaeroides
P06788	Purton S	Nuclear control of chloroplast gene expression
P18594	Read ND	Signal transduction, microtubule dynamics and calcium signalling during vegetative hyphal fusion in neurospora
P10360	Roberts IS	Studies on group II capsular polysaccharide biosynthesis in Escherichia coli
P15253	Robinson C	Functional dissection of bacterial and chloroplast protein translocation mechanisms using GFP imaging
P12850	Robinson NJ	CPx/P1-type transporters of Synechocystis: (i) Metal specificity, and (ii) Cu-trafficking for photosynthesis
P17268	Rossiter JT	Disarming the glucosinolate-myrosinase system in the cabbage aphid - consequences for tritrophic interactions
P13500	Roy P	Assembly of infectious bluetongue virion from cDNA clone
P15018	Sargent F	Assembly of respiratory hydrogenase complexes
P11485	Scott IM	Salicylic acid and H <sub>2</sub> O <sub>2</sub> in abiotic stress acclimation in plants
P11564	Shaw D	Evolution of Phytophthora infestans on potato in the UK: the roles of sexual and asexual recombination
P10241	Smirnoff N	The role of novel L-galactose metabolising enzymes in ascorbate biosynthesis by plants
P15126	Smith AG	Characterisation of T-DNA tagged 14-3-3 Arabidopsis mutants
P13859	Smith SM	The function of glyoxylate cycle enzymes in plant growth and development
P18196	Sockett RE	Developing a functional flagellar toolkit by studying chimeric proteins
P09655	Spiro S	Characterisation of a nitric oxide responsive transcription factor
P18545	Stoker N	The trcRS regulon of Mycobacterium tuberculosis
P15068	Taylor A	Trans-cellular Ca <sup>2+</sup> transport and Ca <sup>2+</sup> homeostasis in calcifying microalgae
P15873	Taylor IB	Genetic manipulation of xanthophyll synthesis to sustain ABA accumulation
P10162	Terry M	Light regulation of glutamyl-tRNA reductase-the first committed step of chlorophyll synthesis
P15257	Thomas CM	Biosynthesis of mupirocin by Pseudomonas fluorescens
P07303	Thomas CR	Examination of resistance to hyphal breakage in actinomycetes
P18058	Turner G	Functional analysis of fungal phosphopantetheinyl transferase
P13877	Twell D	Functional analysis of transposon-tagged gametophytic fertility genes in Arabidopsis
P17923	Wang TL	Transcriptional regulation of phenylpropanoid biosynthesis in legumes
P13479	White G	Functional genomics in bacteria assimilating nitro-organic explosives
P11981	Whitehall S	Characterisation of fission yeast Tup Ssn6 proteins and their role in the regulation of stress inducible genes
P11527	Williams LE	Heavy metal transporting ATPases in higher plants; structure, function and physiological role
P10381	Williams PA	Molecular characterisation of the genes and enzymes of the gentisate pathway for aromatic catabolism
P10389	Wood P M	Functional analysis of the alternative respiratory pathways in the wheat 'take all' pathogen Gaeumannomyces graminis var tritici
P16987	Young JPW	Sequencing the genome of Rhizobium leguminosarum

<b>Grant Reference</b>	<b>Principal Investigator</b>	<b>Title</b>
P15165	Young M	The programme underlying dormancy and autocrine resuscitation in <i>Mycobacterium bovis</i> BCG
P16557	Zhang H	How does ABA suppress auxin response in <i>Arabidopsis</i> roots?

## Current grants for which questionnaires were returned

Grant Reference	Principal Investigator	Title
BBD0158551	Aldridge P	Uncoupling flagellar gene expression from flagellar assembly
BBD0024351	Andrews S	Iron mobilisation in the bacterial cell
BBD5217811	Arst H	Exploring calcium homeostasis and signalling in <i>Aspergillus nidulans</i> by using a calcium auxotrophy and a calcium- responsive reporter
BBC5066561	Avery S	Genetic regulation of phenotypic heterogeneity and its benefits for cell populations in fluctuating environments
BBC5142661	Avison MB	Transcriptional networking through the Cre regulons of <i>Escherichia coli</i> and <i>Salmonella typhimurium</i>
BBC5149581	Bennett MJ	Molecular and cellular characterisation of AXR4 function: A key regulator of root auxin and nitrate responses
BBD0045781	Berks BC	Probing the mechanism of the Tat protein transport system at the single complex level in whole bacterial cells
BBC5005951	Blatt MR	Signalling and functional analysis of KCO1 channel interactions in <i>Arabidopsis</i>
BBSB13314	Bogre L	MAP kinase signalling to the plant cell cycle: an integrated functional genomic approach
BBE0015211	Bowers K	Regulation of vacuolar acidity by PtdIns3P and PtdIns(3,5)P2 in <i>Saccharomyces cerevisiae</i> .
BBSB10056	Bowles D	Glucosyltransferases of the common phenylpropanoid pathway
BBC5140901	Brearley CA	Inositol hexakisphosphate as a key regulator of Nod factor induced calcium oscillations
BBC5062991	Brown J	Pathogenicity function of an avirulence gene family in barley powdery mildew
BBC5014841	Busby S	Molecular mechanism of triggering of a bacterial transcription activator
BBD0082041	Carr JP	A viral counter defence protein as a probe for cross-talk or functional overlap between host defence pathways.
BBC0003661	Christie JM	Characterisation of the phot1-interacting protein AtMDR1 and its role in regulating phototropism
BBC0076541	Dominy P	Studies on an <i>Arabidopsis</i> Myb Transcription Factor Controlling Salt Tolerance
BBD5221971	Dove SKD	Molecular function of PI(3,5)P2 and Svp3p in stress signaling
BBC5121611	Foster S	The role of phenylalanine in <i>Staphylococcus aureus</i> pathogenicity
BBC51508X1	Foyer C	Plant growth responses to the environment: interfaces between anti-oxidants, PARP and the cell cycle
BBC5013251	Franklin FCH	Self-incompatibility in <i>Papaver rhoeas</i> : functional characterisation of the pollen S-linked gene STM1
BBD5211811	Franklin-Tong VE	Characterisation of a caspase-like protein activated by the SI response in <i>Papaver rhoeas</i>
BBC5133691	Fray RG	An investigation into the role of post-transcriptional methylation of plant mRNA during development
P19284	Fricker MD	In vivo mapping of N-metabolism during foraging for patchy resources by cord-forming basidiomy- cetes
BBC5122531	Gatehouse JA	Investigation of the function of the PTPKIS protein phosphatase in the regulation of starch degradation in <i>Arabidopsis</i> leaves
BBD0114341	Gow NAR	Vacuole segregation and mycelial development of <i>Candida albicans</i>
BBC5141152	Grant MR	Unravelling Plant Systemic Immunity; a genetic and metabolomic dissection of systemic acquired resistance
BBD0135851	Grierson CS	Regulation of <i>Arabidopsis</i> growth and development by the S-acyltransferase TIP1.
BBD0097661	Gurr SJ	Signals and Sensors: Are particular <i>Magnaporthe grisea</i> cutinases pivotal in host perception, priming signal relay and pathogenicity?
P198612	Halliday KJ	The role of phyB in the control of reproductive timing

Grant Reference	Principal Investigator	Title
P20247	Halpin C	Illuminating the cell biology of lignification using live imaging microscopy
BBSB12261	Hammond-Kosack KE	Functional evaluation of plant defence signalling against Fusarium ear blight disease in Arabidopsis
BBD5216651	Harberd N	Understanding DELLA-mediated regulation of plant growth
BBD0035631	Horsburgh MJ	The Staphylococcus aureus response to bactericidal fatty acids and its role in pathogenicity
BBE0043931	Howe C	Plastid-to-nucleus signalling in Plasmodium
BBD0165411	Jarvis RP	Genetic suppressors of Arabidopsis chloroplast protein import mutations
BBD0192811	Jenkins GI	Characterisation of a UV-B-specific signalling pathway
BBC5088771	Johnson G N	Functional genomic analysis of the regulation of photosynthetic electron transport
BBD0091621	Knight MR	Cross-talk between cold and light signalling pathways in Arabidopsis thaliana.
BBD0095961	Kopriva S	Regulation of sulphur partitioning between primary and secondary metabolism
BBD0019431	le Brun NE	Iron mobilisation in the bacterial cell
BBC5133501	Maini P	Robustness and sensitivity of intracellular signals in bacteria
BBD5231351	Mansfield JW	Genetic dissection of basal resistance to microbial colonisation in Arabidopsis
BBSB0658X	Maule AJ	Functional analysis of a plant protein important for the cell-to-cell movement of potyviruses
BBD0182261	Merrick M	Dissecting the nitrogen regulation system of streptomycetes
BBC5136691	Oldroyd G	Inositol hexakisphosphate as a key regulator of Nod factor induced calcium oscillations
BBE0015641	Oparka KJ	Imaging the early events of virus infection in plants
BBC5038541	Paget M	Adapting to zinc deficiency and disulphide stress in Streptomyces coelicolor
BBD0001811	Parish T	The mode of fosmidomycin resistance in Mycobacterium tuberculosis
BBC51257X1	Paul M	Integration of leaf metabolism and physiology by the trehalose pathway
BBC5099311	Price A	What makes rice roots able to penetrate hard layers? An integrated biophysical, modelling, genetic and molecular approach
BBSB09872	Pritchard J	Role of plant amino acid transporters in determining the performance of phloem-feeding aphids: functional genomics in Arabidopsis
BBD00456X1	Rathjen J	Molecular regulation of the tomato disease resistance protein Prf
BBD0121551	Robbins T	Investigating the role of the S locus F-box protein SLF in RNase-mediated self-incompatibility
BBC0064881	Sadanandom A	The role of the Arabidopsis Sumo-Protease, STR1 in salt stress signalling.
BBE0014081	Schultze M	Identification of two early acting plant genes in the mycorrhizal symbiosis
BBD0012341	Scott R	Identifying determinants of hybridisation barriers in Arabidopsis
BBSB12318	Shearman CA	Analysis and exploitation of genes and proteins involved in high frequency lactococcal conjugation
BBC5105911	Shewry R	Integration and coordination of UK research on the genomics, genetics and improvement of small grain cereals
BBD0006531	Simpson GG	Native RNA targets of a plant-specific RNA binding protein that controls Arabidopsis development
BBC5132181	Spanu PD	Regulatory elements that control expression of virulence associated genes in the powdery mildew Blumeria graminis
BBC5098071	Thomas GH	Sialic acid transport in pathogenic bacteria: a novel role for TRAP transport systems

<b>Grant Reference</b>	<b>Principal Investigator</b>	<b>Title</b>
BBC5003601	Thomson AJ	Signal perception by the global transcription factor FNR - a joint Sheffield-UEA study
BBC5094901	Tor M	Elucidating the receptor like protein-mediated defence response in Arabidopsis using the downy mildew resistance gene RPP27
BBD0099441	Urwin PE	Characterisation of the processes of nutrient flow from a host plant to a parasitic nematode
BBC5028491	van der Woude M	The intricacy of bacterial epigenetics: DNA methylation- dependent phase variation and the cell cycle in E. coli
BBC5139771	van West P	Characterisation and development of gene silencing in Phytophthora infestans for high-throughput determination of gene function
BBC0083671	Waterfield NR	A novel toxin delivery system in bacteria
BBD0103811	Webb AAR	Determining how the circadian clock increases chlorophyll content
BBC5078371	Whalley WR	What makes rice roots able to penetrate hard layers? An integrated biophysical, modelling, genetic and molecular approach
BBD0004831	Whitelam G	Intersection of phytochrome signalling and temperature acclimation in Arabidopsis
BBC5126451	Wingler A	Integration of leaf metabolism and physiology by the trehalose pathway