Diet and Health Research Industry Club (DRINC)

Call Launch Workshop

3 June 2014

www.bbsrc.ac.uk/drinc

BBSRC
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Great British Bioscience


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food and drink innovation


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Engineering and Physical Sciences
Research Council


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ECONOMIC
& SOCIAL
RESEARCH
COUNCIL


MRC
Medical
Research
Council

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DRINC Call Launch Workshop
3 June 2014

CCT Venue - Canary Wharf, Level 32, 40 Bank St., London E14 5NR

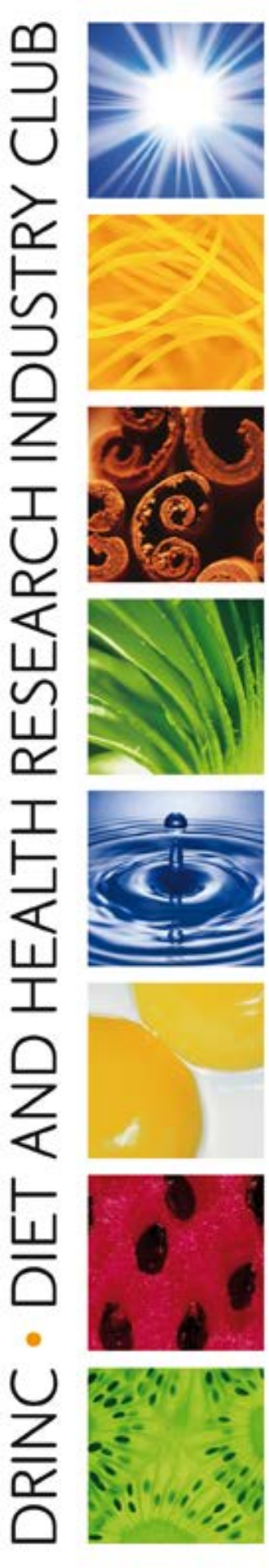
Workshop Programme

10.00	**Arrival – registration, coffee and networking**
10.30	**Welcome and introduction** Jennifer Postles
10.40	**DRINC research challenges** James Phillips
11.00	**Assessment process** Elly Tyacke
11.10	**Introduction to networking activities** Jennifer Postles
11.15	**Elevator pitches from Industry and Academia**
12.20	**Lunch and networking**
13.00	**Networking and application surgery sessions**
16.00	**Meeting Close – further networking time and coffee**

Workshop Aims

The overall aim of this workshop is to support potential applicants to the 2014 DRINC Call. The workshop will be an opportunity to :

- Learn about the Research Challenges and the assessment process
- Meet other potential applicants and form new collaborations
- Discuss their proposals with members of the DRINC Steering Group, representatives from the Club's company members and the Research Councils.



Background: Supporting Research with the Food and Drink Industry

DRINC was first established by the Biotechnology and Biological Science Research Council (BBSRC) in 2007, in partnership with the Medical Research Council (MRC), the Engineering and Physical Sciences Research Council (EPSRC), and a consortium of 15 company members to develop products that deliver enhanced health benefits for consumers.

The Club has funded high quality, pre-competitive research, within UK universities and research institutes, to generate underpinning knowledge and improved skills in diet and health, so developing a community to provide valuable research for the food and drink industry.

Recognising the value of DRINC Research to Industry

In 2011, an independent evaluation concluded that DRINC was more than the sum of the pre-competitive research it supports. In establishing a new network of research capabilities, through enhanced knowledge exchange and on-going multi-disciplinary collaborations, the food and drink industry are able to progress and develop new, healthier products. The key benefits for companies are:

- Influence on research areas supported by public-industry funding
- Up to date knowledge on the progress of research and early access to results
- Discussion with leading researchers, across multiple disciplines, towards healthier food
- Exchange of ideas and staff with potential of forming new collaborations
- Access to future talent pool for food health research and development
- Information and advice related to additional research activities and funding schemes, e.g. studentships, knowledge transfer and collaborative partnerships

The evaluation team recommended a second phase of DRINC to build upon these benefits and broaden the interactions between academia and industry researchers to ensure the continuation of this vibrant UK research community.

Research Tailored to Industry's Needs

BBSRC worked with partners in 2012 to develop a second phase of the Club. A consortium of 15 companies has agreed to support further research. Through discussions with the industry members, three research challenges were identified within the overarching theme of **improving our understanding of the relationship between diet and health:**

- Designing foods to maintain and improve health
- Understanding the relationship between food processing and nutrition
- Understanding food choice and eating behaviour to improve health through diet

The research challenges are described in greater detail in the call text which is reporoduced in full later in this booklet.

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Impacts from DRINC Research

The first phase of DRINC funded 25 research projects nationally, across 26 research centres, and supported a 300 strong community of 110 investigators, 62 PDRA and 30 PhD students. These researchers engaged with over 100 industrial participants across the whole food value chain.

While the £8M of continuation funding secured by the projects is one of the most visible examples of their success, the research has also generated IP on new methods and technology, plus over 60 scientific publications. A summary of outputs from the previously research projects funded from 2008-2012 is available on the "DRINC: Background" page at www.bbsrc.ac.uk/drinc

Steering Group and Management

A Steering Group has been established that includes both industrial and academic experts. The members of the group will undertake the assessment of applications to DRINC and ensure high quality, relevant research is funded. The Steering Group:

- establish the nature of research to be funded in each call
- assess applications before making recommendations to Research Councils
- are involved with the annual and final report reviews for funded projects which provide feedback to researchers in project development and industrial application
- play a key role in ensuring the club builds a community, encouraging interaction between industry and research teams at UK universities and institutes

DRINC2 Chair

Prof Judy Buttriss – British Nutrition Foundation

DRINC2 Industrial members

Dr Sue Gatenby - PepsiCo UK and Ireland
Dr Joanne Lunn - Waitrose
Dr David Mela – Unilever
Dr Katie Newens - SugarNutrition UK
Dr Belinda Quick – Mondelez
Dr Julian Stowell – DuPont
Professor Martin Wickham – Leatherhead Food Research

DRINC2 Academic members

Professor Mark Conner - University of Leeds
Professor John Mathers - Newcastle University
Professor Clare Mills - The University of Manchester
Professor Peter Morgan - Rowett Institute of Nutrition and Health, University of Aberdeen
Dr Fotis Spyropoulos - University of Birmingham
Dr Mark Williams - University of East Anglia
Professor Parveen Yaqoob - University of Readingl

The club is managed by BBSRC and research projects are awarded BBSRC grants using peer review processes as fully public funded research.

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DIET AND HEALTH RESEARCH INDUSTRY CLUB (DRINC) SECOND CALL FOR GRANT APPLICATIONS

INTRODUCTION

The importance of the link between diet and health is recognised by the public[1]. However the complex interactions between dietary components and the consequences for health are not well understood. Furthermore the food industry is a significant contributor to the UK economy. It is the single largest manufacturing sector, employing 3.7 million people, and accounts for around 7% of GDP. The industry is of strategic importance in enabling the UK to meet the challenges of providing a nutritious, safe, accessible and sustainable supply of food to a growing and ageing population in a world with increasingly scarce resources.

The Biotechnology and Biological Sciences Research Council (BBSRC) has identified developing a greater awareness of the roles of nutrition and physical activity, and the mechanisms by which they affect development and health, as a research goal within the key strategic priority of Bioscience for Health[2]. Substantial opportunities for innovative research exist across the food and drink industry with diet and health a significant driver for all businesses in the supply-chain. The research required to address these opportunities is multidisciplinary in nature and will bring together experts from the biosciences, physical sciences, food engineering, and social sciences.

BBSRC, in partnership with the Medical Research Council (MRC) and the Engineering and Physical Sciences Research Council (EPSRC), first established the Diet and Health Research Industry Club (DRINC) in 2007 with 15 company members. Over £15M was provided to support high quality research aimed at improving our understanding of diet and health within UK universities and research institutes. An independent evaluation[3] in 2011 established that the research had helped the food and drink industry to develop and deliver new food products of benefit to the consumer. DRINC now aims to build on this success by funding a second phase of research projects. The Club will continue with a consortium of 16 company members that contribute to funding the research and directing Club activities.

The second phase of DRINC has a total budget of approximately £10M, with £1M from industrial membership subscriptions and £9M from BBSRC. EPSRC[4], the Economic and Social Research Council[5] (ESRC) and MRC[6] will consider funding projects with relevance to their remits. This document provides guidance about the second call for proposals, where there is approximately £3M to be awarded.

[1] http://www.bbsrc.ac.uk/society/dialogue/activities/bbuh-public-workshop.aspx
[2] http://www.bbsrc.ac.uk/publications/planning/strategy/priority-three.aspx
[3] http://www.bbsrc.ac.uk/web/FILES/Reviews/drinc_2011_evaluation_report.pdf
[4] http://www.epsrc.ac.uk
[5] http://www.esrc.ac.uk
[6] http://www.mrc.ac.uk

CLUB AIMS

The aims of DRINC are to:

- Support high quality, innovative basic research within UK universities and Institutes. This research will enhance understanding and facilitate the development of products with health and nutrition benefits and help to address diet-related health issues in the longer term.
- Help to strengthen and develop the research community in the food and nutrition area through interdisciplinary research and the provision of training.
- Ensure knowledge exchange between the science base and industry through the support of effective networking between academic groups and company membership.

SECOND CALL FOR PROPOSALS

Submissions are invited to the second call of the second phase of DRINC. Approximately £3M is available for grant awards through this call. One further call of similar value is planned for Spring 2015. The funding is from BBSRC, potentially other research councils, and the industry members of the Club.

BBSRC has worked with industry to identify three research challenges as described in the next section. Projects supported through the Club will address these challenges through pre-competitive, innovative and excellent science, within BBSRC's scientific remit.

The DRINC Steering Group has developed a summary of common issues identified with applications submitted to the previous call for proposals for applicants to consider and this is included after the description of the research challenges. Resubmissions from previous DRINC calls will only be accepted if feedback from the Steering Group has been fully addressed and there are significant changes to the application. Any resubmissions should be discussed with the DRINC Coordinators prior to submission.

The Coordinators can also offer advice on industrial relevance. Applicants may discuss their ideas with the Club's industry members at a workshop to be held on **3 June 2014** in London. Further details are available on the 'Apply for Funding' webpage at: www.bbsrc.ac.uk/drinc.

There is a two stage application procedure. For the initial outline stage, proposals must be submitted on an outline proposal form, which is available through the Research Councils' Joint Electronic Submission system (Je-S, https://je-s.rcuk.ac.uk). Outline proposals can be submitted from **12 May 2014** until **9 July 2014 at 4.00 pm.** Full proposals will subsequently be invited from applicants successful in the outline stage. Specific guidelines for the call are given in ANNEX 1.

RESEARCH SCOPE OF THE DIET AND HEALTH RESEARCH INDUSTRY CLUB

Research proposals must address at least one of three research challenges, which all sit within the overarching theme of **improving our understanding of the relationship between diet and health.**

The three research challenges are:

- Understanding the relationship between food processing and nutrition
- Designing foods to maintain and improve health
- Understanding food choice and eating behaviour to improve health through diet

Research Challenge 1

Understanding the relationship between food processing and nutrition

This challenge seeks to elucidate how the manufacturing processes involved in food production influence diet and health. The aim is to generate fundamental biological and nutritional knowledge that can inform improvements in food and drink production. For example, improving the understanding and characterisation of how ingredient properties are affected by processing would enable the food and drink industry to optimise operations to deliver products with improved health benefits while maintaining quality.

Proposals in this challenge should be multidisciplinary and may apply expertise from the physical sciences and engineering, including biophysics and biochemistry, to the improvement of the nutritional value of products.

In discussions with the food and drink industry, the following examples were suggested for research projects. The examples are included to stimulate thought and proposals that focus upon other areas are welcome. Research could deliver novel or improved processes for more nutritious products by:

- Developing predictive models to assess the impact of changes in process operations upon nutritional quality.
- Supporting the development of products for consumers with food intolerances and allergies.
- Understanding how to influence the digestion and bioavailability of nutrients and other bioactive agents within foods to derive improved health benefits.
- Enabling the delivery of more nutritionally beneficial food ingredients and product formulations with significantly reduced levels of undesirable nutritional components, while maintaining consumer acceptability, including palatability.
- Understanding how to deliver combinations of ingredients and nutrients to achieve maximum nutritional value and health benefits.
- Improving the affordability and sustainability of healthier food products by developing processes that use ingredients more efficiently, or make use of alternative ingredients, formulations, by-products and waste-streams.
- Developing improved packaging technologies that enable or enhance the delivery of novel bioactive ingredients, including improvements in shelf life and product stability.
- Utilising encapsulation technologies, that are technically and economically viable, to deliver bioactive ingredients to desired regions within the digestive system.

Research Challenge 2

Designing foods to maintain and improve health

Diet influences wellbeing throughout the life-course and public concerns about health problems caused by poor diet are important to the food and drink industry. Projects within this research challenge should make use of multidisciplinary approaches to improve our understanding of the mechanisms by which diet influences and maintains health.

Researchers should seek to respond to the needs of the food and drink industry by generating new knowledge that would contribute to the design of healthier food and drink products that meet consumer demand. For example, research projects could investigate the incorporation of novel ingredients or the optimisation of established ingredients with proven health benefits and consumer acceptance. Projects attempting to improve the nutritional value of products must also show a link with health benefits.

The following examples are provided as guidance for research areas that could fit within this challenge. Proposals that focus upon other areas are welcome. Applicants could increase the fundamental knowledge available to develop improved food and drink products by, for example:

- Researching novel biomarkers that can inform design choices by allowing the assessment of qualities such as exposure or biological effect.
- Improving understanding of how nutrition can support life-long health and wellbeing. This may include investigating changes in dietary requirements throughout the life-course, potentially due to age related changes to muscle mass, bone density, dentition, flavour perception, visual function and cognitive function. This may also include early-life nutrition and dietary needs for maternal health (pregnancy and lactation).
- Investigating bioactive ingredients with physiologically beneficial effects, as recognised by regulators. This includes reducing the risk of developing major diet-related public health conditions, such as diabetes, unhealthy weight and cardiometabolic diseases and also addressing issues such as glycaemic control and (micro-)vascular health.
- Investigating how dietary needs vary by gender, ethnicity, age, and level of physical activity. This could include better assessment methodologies for characterising suboptimal nutrition among different groups to reliably guide further action. Applicants could also consider how dietary needs vary due to lifestyle and other factors that lead to variable eating patterns, such as shift-working.
- Generating novel insights into how health can be supported and maintained by a healthy digestive tract. Including understanding the possible role of the gut microbiome in weight management, metabolism, inflammation and immunity.
- Researching the potential for dietary modulation of epigenetic processes to achieve health benefits.
- Investigating the management of food intolerance and allergies through understanding sensitisation, characterising ingredients, and analysing the host immune response mechanisms, to enable development of formulations that maintain the desirable qualities of food products without triggering immune responses.
- Using systems approaches to enhance understanding of the complex relationships between combinations of nutrients, dietary patterns and human health outcomes. This could also include developing and testing models for assessing metabolic resilience in a dietary context.

Research Challenge 3

Understanding food choice and eating behaviour to improve health through diet

Proposals responding to this challenge would seek to increase our understanding of the causes and effects of dietary choices and behaviours, how these relate to health, and how they can be influenced. Applicants may consider projects at the interface between psychology and biology, potentially making use of emerging technologies and bioinformatics as tools to investigate relationships, such as those between affective reactions, food consumption and purchase.

An improved fundamental understanding of the interaction between consumer behaviour, liking, and sensations of satiety, hunger and thirst will help the food industry to create products that support behaviours of benefit to health by satisfying consumer expectations while optimising dietary intake. Furthermore, understanding how the behaviour and perceptions which cause these expectations vary across the life-course will inform the design of targeted food products.

Research could improve our understanding of the factors influencing behaviour relating to food purchasing and consumption in individuals, families and other groups or cohorts. Examples are provided below to stimulate thought however proposals that focus upon other areas are welcome. Examples might include:

- Projects that investigate methods for initiating and maintaining behaviours associated with the management of healthy weight, including discouraging over-consumption.
- Investigating the sensory signals that are received by the brain from the entire body, including the gut, in response to ingestion, and how these influence behaviour and contribute to homeostasis.
- Exploring how food characteristics, such as texture, taste, and portion size trigger and influence food choice and eating behaviour, and how this changes over the life-course.
- Testing how foods may be designed with characteristics that support healthy behaviours. This may include considering how sensory cues, including taste, can be provided so that health benefits are perceivable by consumers.
- Assessing how factors such as gender, ethnicity, age, affective reactions and levels of physical activity can influence choices about what, when, and how much, to eat.
- Investigating how food form and the delivery of food energy can influence the relationship between satiety and nutritional value.
- Furthering our understanding of how the selection and consumption of one food product might influence other purchasing and consumption decisions and connecting these to human health outcomes.
- Investigating and developing tools and technologies for evaluating dietary patterns as a whole, including understanding trade-offs, and how the knowledge generated may inform strategies for effecting behaviour change.

Notes:

- The research projects supported by DRINC will fit within the overarching theme of **improving our understanding of how diet affects human health** and will relate this understanding to the development of food and drink products of benefit to the consumer.

- The research challenge titles are unchanged from the previous DRINC call but the descriptions have been updated. The challenges overlap and so multidisciplinary proposals that respond to multiple issues are encouraged**. The examples provided in the description of each research challenge are for guidance only and different research projects may be proposed.** Applicants are advised to discuss their proposals with the DRINC Coordinator for guidance about relevance to DRINC.

- Research that generates new understandings of the biochemical and physiological mechanisms whereby diet influences human health will be of relevance to the establishment of **accepted health claims.** However **DRINC projects should be pre-competitive.** Projects assessing proof-of-principle for efficacy should not focus on generating evidence for EFSA about propriety products. DRINC research projects should however follow relevant EFSA criteria[7], especially where the outcomes might foreseeably find use in claims dossiers.

- Research funded through DRINC must be of strategic relevance to the food and drink industry. Applicants should use whichever methodologies and capabilities will best test their hypotheses about human interactions with food and drink. As such, the development of validated human models and the translation of results from in-silico, in-vitro and relevant in-vivo studies, with clear application and utility to human health, is an important area of interest for the Club. **Applicants proposing to use model organisms for DRINC research must fully demonstrate prior relevance of the model organism to food and drink product development, including evidence to show upstream modeling methods indicate such model organism would add value to the food and drink research.** Applications including model organisms for food and drink research must adhere to BBSRC's standard requirements for animal research. The Research Councils will continue to fund projects which require the use of animals for research through other programmes and initiatives as appropriate.

- DRINC research projects **should seek to relate improved understanding to the challenges facing the food and drink industry**. For example, research projects could apply mechanistic knowledge about the health effects of food ingredients to consider how raw materials should be selected, produced and processed to increase nutritional value and also reduce waste. Projects could also seek to apply strategies and techniques for facilitating sustained acceptance of foods with improved nutritional quality among consumers. Additionally the value of well-designed cohort studies in addressing the challenges is recognised and such approaches are considered appropriate.

[7] http://www.efsa.europa.eu/en/nda/ndaguidelines.htm

QUESTIONS TO CONSIDER WHEN WRITING YOUR APPLICATION

This section summarises common issues identified by the DRINC Steering Group when assessing the outline proposals received in response to the 2013 call. Applicants should consider these points when developing their proposals:

Will the research generate evidence for a functional ingredient or phenomenon?

- DRINC is not the preferred route for the substantiation of functional ingredient claims.
- Outcomes should be pre-competitive and widely applicable for industry or public health and should not be reliant upon proprietary technology or know-how.
- Experiments should test general mechanisms, design rules or hypotheses to establish proof of principle and aid selection of potential leads, technologies or consumer guidance.

Is there clear justification for the measurements to be made or techniques applied?

- All proposed measures must be necessary to meet the project's primary objectives.
- The measures should test explicit, important *a priori* hypotheses.
- The output of the measurements should lead to subsequent actions, such as informing the design or direction of further experiments, feasibility studies or potential applications.

Does the proposal have a clear focus?

- All project components must contribute to the proposal's clearly stated research goals.
- Human trials should have well-defined *a priori* primary outcome measures and corresponding statistical analysis plans.
- Hypothesis testing should be clearly separated from hypothesis generation.

Does the research seek to demonstrate a novel approach for solving a problem?

- Applicants should demonstrate awareness of previous approaches.
- Applicants should establish that the problem they seek to solve is a significant issue or knowledge-gap for the potential users of their research.
- Safety, regulation, sensory quality, consumer acceptance and cost should be considered.

Does the research include untested technologies or approaches?

- Preliminary data or related examples should show that the approach is feasible.
- Applicants should include clear and early criteria for deciding whether to continue when negative results are generated as well as alternative plans for continuing the project.

Are the test materials (e.g. fibres, extracts, total diets) sufficiently defined?

- The specification should allow for replication and the determination of causality.

Will the proposal include a large, high-risk clinical trial?

- The research team must include the expertise for designing and running clinical trials.
- The trials must be designed to achieve decisive outcomes, such as proving causality.
- Expected results should be relevant, i.e. not only statistically but also physiologically.
- There should be sufficient pre-clinical data or pilot studies proposed to enable the optimal test materials, conditions and human trial design to be defined, as well as the identification of scenarios in which the studies should not continue.
- Applicants must show evidence for bioavailability of test agents and that the size and variance of the effect on the cohort can be estimated, so that the larger trial can be correctly powered for clearly-defined primary outcomes and for taking decisions about whether to proceed.

INDUSTRY RELEVANCE AND CALL LAUNCH WORKSHOP

Research funded through DRINC must be strategically relevant to the food and drink industry. Proposals must include clear explanations of strategic relevance and identify likely impacts and routes to impact. Applicants should seek to build upon their current research activities by progressing fundamental research to explore potential applications in the food and drink industry. However **applicants are advised that Letters of Support from industry are not required.** Further guidance on Letters of Support is provided at ANNEX 1. Applicants are invited to contact the DRINC Coordinator for guidance about industry relevance.

A workshop for applicants to discuss their ideas with the Club's industry members will be held on 3 June 2014 in London. Further details are available on the 'Apply for Funding' webpage at www.bbsrc.ac.uk/drinc. The workshop will also provide an opportunity for applicants to meet potential collaborators. DRINC aims to expand the capabilities of the diet and health research community and so multidisciplinary applications are welcome.

CONTACTS

BBSRC – Guidance on the Application Process and Eligibility

Jennifer Postles, DRINC Club Manager
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Andrew Telford, DRINC Peer Review Officer
BBSRC, Polaris House, North Star Avenue, Swindon, SN2 1UH
Tel: 01793 442197 Email: andrew.telford@bbsrc.ac.uk

Bioscience KTN, DRINC Coordination Team – Guidance on Project Ideas and Industry Relevance

Bryan Hanley, DRINC Industry Coordinator
Email: bryan.hanley@ktn-uk.org

Jayne Brookman, DRINC Industry Coordinator
Email: jayne.brookman@ktn-uk.org

GUIDELINES FOR CALL

- A workshop will be held on **3 June 2013 in London.** A registration link and further details will be provided on the website: www.bbsrc.ac.uk/drinc.
- Outline proposals must be submitted in the first stage. Successful applicants will be invited to submit full applications to the second stage.
- Total funding of approximately £3M is available from BBSRC for this call to fund projects at 80% fEC. One further call of similar value is planned for this Club.
- Projects are typically 3-4 years in duration but projects between 1-5 years will be considered.
- Proposed research objectives must fit with the DRINC research challenges.
- Proposed science must fall predominantly within BBSRC's remit, but may also include aspects of MRC's, EPSRC's and/or ESRC's remit.
- It is likely that the aims of this Club can best be achieved by interdisciplinary approaches. Collaborative applications bringing together groups with relevant expertise or experience to move research closer to application are encouraged.
- Applications will be shared with all the industry members of DRINC to assess their industrial relevance.
- Proposals should not include details of how studentships would be used. Proposals should be structured to proceed without studentships.

ELIGIBILITY

Standard BBSRC eligibility rules, as described in the section 3 of the Grants Guide (http://www.bbsrc.ac.uk/funding/apply/grants-guide.aspx), apply to this call. Main Research Providers (MRPs) to the Scottish Government are not eligible to apply for funding from this call. This includes the Moredun Research Institute, The James Hutton Institute, Biomathematics and Statistics Scotland (BioSS), and Scotland's Rural College (SRUC).

OUTLINE STAGE APPLICATION PROCEDURE

There is a two stage application process. The information below describes the procedure for the first stage in which applicants are invited to submit **outline proposals** only.

- The closing date for submitting outline proposals is **9 July 2014 at 4:00 pm.** Applicants are advised to allow enough time for their application to clear their institution's internal submission processes by the closing date. **Applications submitted after the closing date will not be accepted.**
- Outline proposals must be submitted using an electronic proforma on the Je-S system. **All applicants must fully complete the proforma.** To access the proforma in Je-S applicants should select:
    - Council: BBSRC
    - Doc Type: Outline Proposal
    - Scheme: Standard Outlines
    - Call/Type/Mode: Diet and Health Research Industry Club - Outline
- The proforma should include a summary of requested resources. However, detailed justification of this request is not required at the outline stage. It is expected that the resources requested in full proposals submitted to the second stage of the application process reflect the requests made in the outline proposals submitted in first stage.

- In addition to the fully completed proforma, through Je-S, applicants must submit:
    - A CV (maximum two pages each; standard font and margin sizes) for the Principal Investigator and each Co-Investigator
    - A completed Case for Support document (maximum five pages; see below)
- **Applicants should note that under no circumstances should their application exceed the page limits described. Outline submissions exceeding the page limits will be withdrawn.**
- Please also refer to the Je-S guidance for Outline proposals in the help section of the Je-S site (https://je-s.rcuk.ac.uk).

OUTLINE STAGE CASE FOR SUPPORT

Applicants must supply a case for support document with their outline proposals. **The whole case for support document should not exceed 5 pages.** Outline proposals with a case for support document that exceeds five pages will be withdrawn.

There is no template for the case for support document, which should be uploaded to the outline proforma as a single document and written with minimum font size 11, single line spacing, minimum and standard character spacing. Page margins should be at least 2cm.

The case for support document should contain the following sections:

Research area

- Please refer to the Research Challenges described earlier in this text and identify which challenge(s) are of relevance to your proposal.

Strategic relevance (Suggested length: approximately 1000 characters including spaces)

- Please explain how your research proposal is strategically relevant to the food and drink industry and the aims of DRINC.

Overview of proposed research (Suggested length: approximately 12000 characters including spaces)

- Identify the aims and objectives of the proposed research.
- Summarise the proposed methodology.
- Explain why the proposed research is of sufficient timeliness and novelty to warrant consideration for funding.
- Comment on the extent to which the proposed project will provide research training and development opportunities of benefit both to the individual(s) employed, and to the wider science base beyond the completion of the specific project.

FULL STAGE APPLICATION PROCEDURE

Applicants who are successful at the outline stage will be invited to write a full proposal for submission to the second stage in **November 2014.** Dates are for guidance only and may be subject to change. Further guidance will be made available to those applicants invited to submit a full proposal, however all applicants should note that:

- Pathways to Impact will only be required at the full proposal stage and should be formulated to meet the needs of the food and drink industry.
- At the full proposal stage, a letter from the applicant's Technology Transfer Office (TTO), or equivalent, will be a mandatory requirement. The letter must confirm that the University or Research Institution accepts the special conditions of this call.

LETTERS OF SUPPORT AND INDUSTRIAL PARTNERS

- **Applicants do not need to include letters of support from industry.** Proposals will not be awarded higher scores for including letters of support. All DRINC member companies are asked to comment on the industrial relevance of any proposals during the assessment process and so letters of support from member companies are not necessary. For proposals where industrial partners intend to contribute to the research project, applicants should consider including letters of support to more fully explain the potential industry contributions.
- There is no requirement for any project to have an industrial partner. 10% of the funding for every project is provided by a consortium of companies which pay annual subscription fees to be members of the club. All the member companies participate in the assessment process and so proposals should be pre-competitive and respond to wider industry challenges rather than the needs of a single company. Individual DRINC member companies can support a DRINC project by making 'in-kind' contributions, such as supplying material or providing access to equipment, and will often identify projects to which they would like to offer support after the outline proposal are submitted.
- Companies that are not club members have previously supported DRINC projects by providing in-kind contributions and this is still welcome. However all projects must adopt the same Grant Conditions, including the Special Conditions in the call text, which includes first access to research results for club members. Alternative BBSRC schemes are available to support collaborations between single companies and researchers.

ASSESSMENT PROCEDURE

- All applications will be assessed by the DRINC Steering Group. The Steering Group consists of a chair, seven academic members and seven industrial representatives from the DRINC Company Members.
- Outline proposals will be assessed by the Steering Group only and will not be externally reviewed. Full proposals will be externally peer reviewed prior to final assessment by the Steering Group. Both outline and full proposals will be assessed using the criteria for assessment in the next section.
- At least two Steering Group members are assigned to each proposal and act as 'Introducers' at the assessment meetings. One Introducer is based in academia and the other is employed in the food and drink industry.
- The Introducers are asked to propose scores for the two primary assessment criteria: **Scientific Excellence** and **Strategic Relevance to DRINC** as described in the next section. These criteria are given equal weighting so proposals must demonstrate quality in both to be considered fundable.
- Where there is a conflict of interest, such as when a Steering Group member has links to an applicant, the member will leave the assessment meeting while the proposal is being discussed.
- Outline and full proposals may be circulated to DRINC company members that are not represented on the Steering Group. The company members will be invited to submit comments for consideration by the Steering Group during the assessment meetings.
- After the assessment, feedback on proposals will be provided by BBSRC only.

CRITERIA FOR ASSESSMENT

The primary criteria for assessment are the quality of science proposed and the strategic relevance to DRINC. It is expected that all funded proposals will be competitive against comparable

international work and will demonstrate alignment with the club's aims. Proposals will be assessed against the following criteria:

- **Scientific Excellence**
  The extent to which the proposal meets the highest international standards of current research in its field. High performance against this factor will indicate a project of the highest standard, competitive with the best activity anywhere in the world, demonstrating originality and innovative potential.
- **Strategic Relevance to DRINC**
  Demonstrated alignment with the Club's aims and research challenges. Relevance to the food and drink industry. Plans to enhance the impact of the research. Balance of the overall research portfolio of the club.
- **Timeliness and Promise**
  The extent to which the proposal is particularly appropriate at the present time, or offers longer-term benefits over and above the direct value of the research.
- **Economic and Social Impact**
  The extent to which the output of the research will contribute knowledge that shows direct potential for economic return or societal benefits to the UK.
- **Value for Money**
  The extent to which the resources requested, relative to the anticipated scientific gains, represent an attractive investment of Research Council funds.
- **Staff Training Potential of the Project**
  Where resources are requested for postdoctoral or other research staff the extent to which the proposed project will provide research training and development opportunities of benefit both to the individual(s) employed, and to the wider science base beyond the completion of the specific project.

SPECIAL CONDITIONS

Recognising the financial support from industrial members of the Club, it should be noted that special conditions will be attached to any research grants from DRINC. A letter from the institution's technology transfer office or equivalent, acknowledging that the institution is able to accept those conditions, will be requested at the full proposal stage. The conditions are as follows:

- Grant holders will be expected to liaise with the external coordinator of the club, making available progress reports as requested and participating in meetings with both industrial members and other participants

- To respond to requests from BBSRC regarding project outcomes as required, during and following the end of the award

Early Access

- Industry Members are entitled to early access to results from research funded by the Club. To ensure this grant holders must:

  - Give a minimum of 6 weeks' notice of an intention to publish, outside of the Club, results from research funded by a Club grant. The material for proposed publication should be submitted to the Club coordinator along with the notice of intent to publish. The coordinator will distribute a copy of the same to each of the industrial members within seven days of receipt; who shall then have 5 weeks to inform the coordinator if in their view the proposed publication may (i) dilute or prejudice the value of proprietary information of an industrial member or (ii) jeopardise the application for resulting IPR protection or (iii) otherwise inhibit future exploitation of the results and whether an industrial member has an interest in exploiting those results. The coordinator will feedback comments to the grant holders who will be expected to consider the advice with their technology transfer officer. If an industry member wishes to enter into negotiations with a grant holder regarding exploitation of IP, these negotiations may be pursued as outlined in "Access to resulting IPR".
  - Produce annual progress reports. A form will be provided for the grant holder to complete annually and the grant holder will be notified in advance when the final report will be due.
  - Attend and present the results and progress of Club funded research at 9-monthly Club dissemination events. Grant holder will be notified of the dates and format of their presentation. Grant holders will be expected to submit research update summaries for dissemination event booklets and encouraged to submit posters for the event.
  - Give advance notification of any opportunities to exploit intellectual property arising from their grant to the industrial members.

Access to resulting IPR

- Industry members are entitled, if they wish, to engage in good faith negotiations with the grant holders for terms of access to the resulting IPR to allow further development or commercial exploitation of results, such access rights preferably to include the right to sublicense. This must be offered before access to resulting IPR can be offered to third parties outside the Club. An interested Industrial member can exercise its option right by giving notice to the grant holder within one month of the date of receipt of notice of results or resulting IPR.

Good Faith Negotiations

- Good faith negotiations imply a willingness to reach agreement with industry members on the terms and conditions of a commercial license, to desist from publishing results or making offers to third parties while negotiation with industrial members are on-going and, if such agreement is not reached within a reasonable period (for example four months from the exercise of the option) that the grant holder will not seek to enter into negotiations with third parties on terms substantially more favourable to third parties.

Background IP

- Should an instance arise where an industry member wishes to contribute background IP or offer in-kind services, these must be offered on the understanding that the terms and conditions of grant, including the dissemination of results and commercial opportunities will remain the same, unless agreed otherwise by the funders and industry members.

DELEGATE LIST

Dr Katherine Appleton,
Associate Professor, Bournemouth University

Dr Yongping Bao,
Senior Lecturer, University of East Anglia

Dr Sarah Berry,
Lecturer, Kings College London

Professor Ashley Blackshaw,
Professor of Enteric Neuroscience, Barts and The London School of Medicine and Dentistry, Blizard Institute, Neurogastroenterology Group

Dr Jayne Brookman,
Head of Food, KTN

Dr Guy Carpenter,
Reader, KCL

Dr Sandrine Claus,
Lecturer, The University of Reading

Prof Paul Fraser,
Professor of Biochemistry, Royal Holloway University of London

Prof Timothy Frayling,
University of Exeter

Dr Trevor George,
Senior Lecturer in Human Nutrition and Food Science, Northumbria University

Professor Ian Givens,
Professor of Food Chain Nutrition, University of Reading

Dr Terri Grassby,
Research Associate, King's College London

Dr Wendy Hall,
Lecturer in Nutritional Sciences, King's College London
wendy.hall@kcl.ac.uk

Professor Bryan Hanley,
DRINC Coordination Team, KTN

Dr Scott Harding,
Lecturer in Nutritional Sciences, King's College London

Dr Paul Harrow,
GI Research Fellow & Registrar, QMUL

Professor Marion Hetherington,
Professor of Biopsychology, University of Leeds

Dr Ditte Hobbs,
Research fellow, University of Reading

Dr Albert Koulman,
Senior scientist, MRC HNR

Dr Charlotte Lawson,
Senior Lecturer, Royal Veterinary College

Prof Alison Lennox,
Professor of Public Health Nutrition, University of Surrey

Prof Petros Ligoxygakis,
Associate Professor, University of Oxford

Dr Joanne Lunn,
Senior Nutritionist, Waitrose Ltd

Dr David Mela,
Senior Scientist, Unilever

Dr Lisa Methven,
Researcher, University of Reading

Dr Keshavan Niranjan,
University of Reading

Miss Sarah Nicholson,
Assistant Peer Review Officer, BBSRC

Dr Caroline Orfila,
Director of Research and Innovation, University of Leeds

Mr Jacob Pattem,
Researcher, Center for Oral Health Research (COHR) Newcastle University

Mr James Phillips,
Senior Business Interaction Manager, BBSRC

Dr Jennifer Postles
Business Interaction Manager, BBSRC

Dr Belinda Quick
Nutrition Manager Northern Europe, Mondelez International

Dr Paul Sharp,
Senior Lecturer, King's College London

Dr Julian Stowell,
Nutrition Science Consultant, DuPont

Dr Sandrine Thuret,
Lecturer and head of the Nutrition, Neurogenesis and Mental Health Laboratory, King's College London

Dr Pretima Titoria,
Consultant: Food Ingredients, Leatherhead Food Research

Ms Elly Tyacke,
Assistant Peer Review Officer, BBSRC

Prof Antonio Vidal-Puig,
Prof of Molecular Nutrition, U Cambridge

Prof Caroline Wheeler-Jones,
Chair of Vascular Cell Biology, Royal Veterinary College

Prof Robin Williams,
Prof of Molecular Cell Biology, Royal Holloway

Dr Ian Wilson,
Reader, University of Cambridge

Professor Parveen Yaqoob,
PI, University of Reading

Researcher Profiles

Dr Katherine Appleton (Bournemouth University)

Associate Professor

Research Team Members:
Dr Lisa Methven

Research Interests:
Eating behaviour in the normal population, with specific interests in improving protein intakes in older people.

Expertise Offered:
Expertise in eating behaviours Expertise in sensory sciences Expertise in food science/processing

Latest Publications:
Tsikritzi et al, 2014, JSPA, in press Withers et al, 2014, J Dairy Sci, in press
Withers et al, 2013, Food and Function, 4, 1668-74
Withers et al, 2013, J Sensory Studies, 28, 230-7
Best & Appleton, 2013, JNEB, 45, 751-5 Best & Appleton, 2011, Appetite, 56, 179-82
Appleton, 2009, Appetite, 52, 161-5

Dr Yongping Bao (University of East Anglia)

Senior Lecturer
https://www.uea.ac.uk/medicine/people/profile/y-bao#researchTab

Research Team Members:
Bednar S, Dacosta C, Wang W, Chen Y, Buongiorno L, Liu P, Chu Y.

Research Interests:
(1) Mechanisms of dietary phytochemicals (isothiocyanates and polyphenols) in cancer prevention, and cardiovascular heath. (2) Bioactivity of nanoencapsulated phytochemicals.

Expertise Offered:
Sandra Bednar (PhD student): Bioactivity of the dietary isothiocyanate sulforaphane in cultured neuronal cells.
Wei Wang (Research Technician) Interactions between isothiocyanates and selenium in cancer prevention.
Luigina Pasqualina Buongiorno (PhD student): Neuroprotective effect of dietary isothiocyanates from cruciferous vegetables.
Peng Liu (PhD student): Chemo-preventative activity of nano-encapsulated phytochemicals.
Christopher Dacosta (PhD candidate): Effects of sulforaphane on miRNA expression in normal and tumour cells.
Yin-Yu Chu, (PhD student): Phytochemicals and angiogenesis.
Dr Yuqiong Chen (visiting): Beneficial effects of green tea polyphenols.

Latest Publications:
Barrera LN, Cassidy A, Wei T, Wang W, Belshaw N, Johnson I, Brigelius-Floh AR, Bao Y. (2012) TrxR1 and Gpx2 are potently induced by isothiocyanates and selenium, and mutually cooperate to protect Caco-2 cells against free radical-mediated cell death. BBA-Mol Cell Res. 1823; 1914-1924.
Li D, Wang W, Shan Y, Barrera L, Howie AF, Beckett G, Wu K, Bao Y. (2012) Synergy between sulforaphane and selenium in the up-regulation of thioredoxin reductase and protection against hydrogen peroxide-induced cell death in human hepatocytes. Food Chem. 133, 300-307.
Wang, Q, Bao, Y, Ahire, J and Chao, Y. Co-encapsulation of Biodegradable Nanoparticles with Silicon Quantum Dots and Quercetin for Monitored Delivery. Adv Healthc Mater. 2013;2(3):459-66.
Davidson, R. K., Jupp, O., De Ferrars, R., Kay, C. D., Culley, K. L., Norton, R., Driscoll, C., Vincent, T. L., Donell, S. T., Bao, Y., Clark, I. M. (2013)Sulforaphane represses matrix-degrading proteases and protects cartilage from destruction in vitro and in vivo : Sulforaphane is Protective in the Articular Joint Arthritis and Rheumatism 65.pp. 3130-3140
Hendrickx, W., Decock, J., Mulholland, F., Bao, Y., Fairweather-Tait, S. (2013) Selenium Biomarkers in Prostate Cancer Cell Lines and Influence of Selenium on Invasive Potential of PC3 Cells. Frontiers in oncology 3.pp. 239

Dr Sarah Berry (Kings College London)

Lecturer
http://www.kcl.ac.uk/medicine/research/divisions/dns/index.aspx

Research Team Members:
Dr Wendy Hall Dr Scott Harding Dr Terri Grassby Professor Peter Ellis

Research Interests:
Postprandial metabolism Cardiovascular risk Dietary fatty acids

Expertise Sought:
Industrial expertise for product formulation

Expertise Offered:
Acute and chronic randomised controlled trials of dietary interventions. Vascular function and blood pressure measurements. Analysis of lipids, isoprostanes (GC-MS). Plant cell wall structure and function.

Latest Publications:
Palmitic acid in the sn-2 position decreases glucose-dependent insulinotropic polypeptide secretion in healthy adults. Filippou, A., Berry, S. E., Baumgartner, S., Mensink, R. P. & Sanders, T. A. B. 2014 In : European Journal of Clinical Nutrition.
Acute Effects of Pomegranate Extract on Postprandial Lipaemia, Vascular Function and Blood Pressure. Mathew, A. S., Capel-Williams, G. M., Berry, S. E. E. & Hall, W. L. Dec 2012 In : Plant Foods For Human Nutrition. 67, 4, p. 351-357 7 p.
Palmitic acid in the sn-2 position of triacylglycerols acutely influences postprandial lipid metabolism. Sanders, T. A. B., Filippou, A., Berry, S. E., Baumgartner, S. & Mensink, R. P. 1 Dec 2011 In : American Journal of Clinical Nutrition. 94, 6, p. 1433-1441 9 p.
Increased potassium intake from fruit and vegetables or supplements does not lower blood pressure or improve vascular function in UK men and women with early hypertension: a randomised controlled trial. Berry, S. E., Mulla, U. Z., Chowienczyk, P. J. & Sanders, T. A. B. 28 Dec 2010 In : British Journal of Nutrition. 104, 12, p. 1839 - 1847 9 p.
intestinal Bifidobacterium strains for growth, acidification, EPS production and viscosity potential in low-fat milk. International Dairy Journal, 23 (1). pp. 36-44. Cook, M. T., Tzortzis, G., Charalampopoulos, D. and Khutoryanskiy, V. V. (2012)

Dr Guy Carpenter (KCL)

Reader

Research Team Members:
Thomas Reddyhoff- Imperial college

Research Interests:
Sugar reduction in drinks

Expertise Sought:
Novel ingredients

Expertise Offered:
Salivary research and oral biology.

Dr Sandrine Claus (University of Reading)

Lecturer

Research Team Members:
Prof Glenn Gibson (microbiologist) Prof Jonathan Brostoff (gastroenterologist) Prof Jeremy Sanderson (gastroenterologist)

Research Interests:
My research focuses on the host-gut microbial metabolic interactions in order to link gut microbial ecology to

metabolic health. My expertise is to use metabolic profiling approaches combined to multivariate statistics to detect metabolic patterns associated with nutritional variations, also called nutrimetabonomics. Applications include metabolic monitoring of diet intervention and exploration of the impact of gut microbiota on metabolic disorders such as type II diabetes and metabolic syndrome.

Expertise Sought:
We are seeking potential collaborators who may be able to provide support in the analysis of the composition and quantification of polysaccharides and gut transit time studies.

Expertise Offered:
Our fields of expertise are listed below: Microbiology: Analysis of gut bacteria (identification and quantification) Metabolic profiling: human, animal, cell and bacterial cultures (including fecal waters to determine the gut microbial metabolic activity) Carry out human intervention studies (Recruitment of individuals with gastrointestinal or metabolic disorders)

Latest Publications:
Swann, J. R., & Claus, S. P. (2014). Nutrimetabonomics: nutritional applications of metabolic profiling. Science Progress, 97(1), 41-47.
Aidy, El, S., et al. (2013a). Gut bacteria-host metabolic interplay during conventionalisation of the mouse germfree colon. The ISME Journal, 7(4), 743-755.
Aidy, El, S., et al. (2013b). The gut microbiota elicits a profound metabolic reorientation in the mouse jejunal mucosa during conventionalisation. Gut, 62(9), 1306-1314.
Boulang, C. L., et al. (2013). Early Metabolic Adaptation in C57BL/6 Mice Resistant to High Fat Diet Induced Weight Gain Involves an Activation of Mitochondrial Oxidative Pathways. Journal of Proteome Research, 12, 1956-1968.
Claus, S. P. (2013). Fighting Undernutrition: Don't Forget the Bugs. Cell Host & Microbe, 13(3), 239-240.

Prof Paul Fraser (Royal Holloway University of London)

Professor of Biochemistry
www.metapro.eu, www.plantengine.eu

Research Interests:
Elevation and alteration of health promoting phytochemicals in foodstuffs, particularly isoprenoid compounds such as carotenoids which act as natural colourants and bioactives.

Expertise Sought:
Metabolomics, proteomics and genetic intervention

Expertise Offered:
The group is engaged in the elevation and alteration of industrial and nutritional isoprenoid compounds (such as carotenoids) in plants and microorganisms.

Latest Publications:
Perez-Fons, L. Bramley, P.M. and Fraser, P.D. (2013). The optimisation and application of a metabolite profiling procedure for the metabolic phenotyping of Bacillus species. Metabolomics, DOI 10.1007/511306-013-0553-6.
Nogueira M, Mora L, Enfissi EM, Bramley PM, Fraser PD. (2013). Sub-chromoplast sequestration of carotenoids impacts on pathway regulation in tomato lines expressing different carotenoid gene combinations. Plant Cell. 25, 4560-4579.
Perez-Fons, L., Wells, T., Corol, D,I., Beale, M.H., Ward,J.L., Bramley, P.M. and Fraser,P.D. (2014). A genome-wide metabolomics resource for tomato fruit from Solanum pennellii. Nature Scientific Reports, 4, 3859.

Prof Timothy Frayling (University of Exeter)

http://medicine.exeter.ac.uk/research/diabetes/moleculargenetics-polygenic/

Research Team Members:
Rachel Freathy, Michael Weedon, Andrew Wood, Hanieh Yaghootkar,

Research Interests:
Human genetics of type 2 diabetes and obesity

Expertise Sought:
I am interesting in interacting with the food industry in general as I think they have a big role to play in reducing obesity

Expertise Offered:
Large scale genetics and genomics with human DNA samples. The ability to recall individuals in our local research volunteer database (N=7000 currently, aim for 10,000) for specific and detailed tests.

Latest Publications:
Please pubmed Frayling

Prof Ian Givens (University of Reading)

Professor of Food Chain Nutrition
http://www.reading.ac.uk/food/

Research Team Members:
Professor Julie Lovegrove Dr Oonagh Markey Dr Ditte Hobbs Dr Kirsty Kliem Dr Alistair Grandison Dr Colette Fagan Professor Chris Reynolds

Research Interests:
Effects of nutrition and food on chronic disease with a focus on dairy products and cardiovascular disesae. Current work involves the impact of replacing dairy saturated fats with mono/polyunsaturats and the role of milk proteins in blood pressure and vascular stiffness control

Expertise Sought:
Key commercial partners will include milk processors, cheese makers and food retailers. Some discsussions with the first two types have already happened

Expertise Offered:
In relation to our focus on animal-derived foods we can can work from primary production through processing to human intervention studies with multiple outcome measures. We also work in collaboration with the University of Cardiff Hospital Epidemiology group to study the role of propsective cohort studies for directing RCT targets. Recent and ongoing work includes the prospective outcomes for the effect of dairy product consumption and cardiovascular disease (including T2DM) and BMI. We have recently completed a DRINC 1 project on replacing saturated fatty acids in dairy products with mainly MUFA by alteration of the diet of the dairy cow. This work has progressed to a new MRC funded intervention project on the chronic and acute impact of fatty acid modified dairy products on risk factors for CVD. Prospective data has shown an inverse association between milk consumption and blood pressure, More recently we have shown a similar association with vascular stiffness a potentially more holistic risk marker. We are now undertaking an intervention study (a BBSRC DRINC PhD plus industry funding) comapring the effect of the major milk protein groups on acute and chronic effects on blood pressure and vascualr function. Other new work involves the role of dietary supply of vitamin D and viatmin D sub-types.

Latest Publications:
Livingstone, K. M., Givens, D. I., Jackson, K.G. and Lovegrove, J. A. (2014). Comparative effect of dairy fatty acids on cell adhesion molecules, nitric oxide and relative gene expression in healthy and diabetic human aortic endothelial cells. Atherosclerosis, published online: 26-FEB-2014. DOI: 10.1016/j.atherosclerosis.2014.02.015
Fekete, Á. A., Givens, D. I. and Lovegrove, J. A. (2013). The impact of milk proteins and peptides on blood pressure and vascular function: a review of evidence from human intervention studies. Nutrition Research Reviews, 26: 177-190.
Livingstone, K.M., Givens, D.I., Cockcroft, J.R., Pickering, J.E. and Lovegrove, J.A. (2013) Is fatty acid intake a predictor of arterial stiffness and blood pressure in men? Evidence from the Caerphilly Prospective Study. Nutrition, Metabolism & Cardiovascular Diseases, 23: 1079-1085
Livingstone, K.M., Lovegrove, J.A., Cockcroft, J.R., Pickering, J.E., Elwood, P.C. and Givens, D.I. (2013). Does dairy food intake predict arterial stiffness and blood pressure in men? Evidence from the Caerphilly Prospective Study. Hypertension, 61: 42-47.
Dougkas, A., Yaqoob, P., Givens, D.I., Reynolds, C.K. and Minihane, A.M. (2013). The impact of obesity-related single nucleotide polymorphisms on appetite and energy intake: a pilot study. British Journal of Nutrition, 110:1151-1156

Dr Terri Grassby (King's College London)

Research Associate

Research Team Members:
Dr Wendy Hall Dr Scott Harding Dr Sarah Berry Professor Peter Ellis

Research Interests:
Postprandial metabolism Plant cell wall structure

Expertise Sought:
Industrial expertise/capacity for product formulation

Expertise Offered:
Acute and chronic randomised controlled trials of dietary interventions. Vascular function and blood pressure measurements. Analysis of lipids, isoprostanes (GC-MS). Plant cell wall structure and function.

Latest Publications:
Grassby, T., Jay, A.J., Merali, Z., Parker, M.L., Parr, A.J., Faulds, C.B., Waldron, K.W. (2013) Compositional analysis of Chinese water chestnut (Eleocharis dulcis) cell-wall material from parenchyma, epidermis and sub-epidermal tissues. Journal of Agricultural and Food Chemistry 61(40):9680-9688
Grassby, T., Edwards, C.H., Grundy, M., Ellis, P.R. (2012) Chapter 4: Functional components and mechanisms of action of â€˜dietary fibreâ€™ in the upper gastrointestinal tract: implications for health. In: Harding, S. E. (ed) Stability of complex carbohydrate structures: biofuels, foods, vaccines and shipwrecks. Royal Society of Chemistry, Cambridge. ISBN 9781849735636
Butterworth, P.J., Warren, F.J., Grassby, T., Patel, H., Ellis, P.R. (2012) Analysis of starch amylolysis using plots for first-order kinetics. Carbohydrate Polymers 87(3):2189-2197
Knudsen, G.M., Nielsen, M.-B., Grassby, T., Danino-Appleton, V., Thomsen, L.E., Colquhoun, I.J., Brocklehurst, T.F., Olsen, J.E. and Hinton, J.C.D. (2012) A third mode of surface-associated growth: immobilization of Salmonella enterica serovar Typhimurium modulates the RpoS-directed transcriptional programme. Environmental Microbiology 14(8): 1855-1875

Dr Wendy Hall (King's College London)

Lecturer in Nutritional Sciences
http://www.kcl.ac.uk/medicine/research/divisions/dns/index.aspx

Research Team Members:
Dr Sarah Berry Dr Scott Harding Dr Terri Grassby Professor Peter Ellis Prof Kevin Whelan

Research Interests:
Postprandial metabolism Cardiovascular risk Dietary fatty acids Polyphenols

Expertise Sought:
Industrial expertise for product formulation

Expertise Offered:
Acute and chronic randomised controlled trials of dietary interventions. Vascular function and blood pressure measurements. Analysis of lipids, isoprostanes (GC-MS). Plant cell wall structure and function.

Latest Publications:
Al-Hilal, M., AlSaleh, A., Maniou, Z., Lewis, F.J., Hall, W.L., Sanders, T.A.B. & O'Dell, S.D. 2013, "Genetic variation at the FADS1-FADS2 gene locus influences delta-5 desaturase activity and LC-PUFA proportions after fish oil supplement", Journal of lipid research, vol. 54, no. 2, pp. 542-551.
AlSaleh, A., Crepostnaia, D., Maniou, Z., Lewis, F.J., Hall, W.L., Sanders, T.A.B. & O'Dell, S.D. 2013, "Adiponectin gene variant interacts with fish oil supplementation to influence serum adiponectin in older individuals", Journal of Nutrition, vol. 143, no. 7, pp. 1021-1027.
AlSaleh, A., Maniou, Z., Lewis, F.J., Hall, W.L., Sanders, T.A.B. & O'Dell, S.D. 2014, ELOVL2 gene polymorphisms are associated with increases in plasma eicosapentaenoic and docosahexaenoic acid proportions after fish oil supplement□, Genes and Nutrition, 9 (1), pp 1-9.

AlSaleh, A., Maniou, Z., Lewis, F.J., Hall, W.L., Sanders, T.A.B. & O'Dell, S.D. 2014, Interaction between c-Src Tyrosine Kinase gene variant and fish oil intake influences blood pressure in healthy adults□, Journal of Nutrition, epub ahead of print.
Delgado-Lista, J., Perez-Martinez, P., Garcia-Rios, A., Phillips, C.M., Hall, W., Gjelstad, I.M.F., Lairon, D., Saris, W., Kiec-Wilk, B., Karlstrom, B., Drevon, C.A., Defoort, C., Blaak, E.E., Dembinska-Kiec, A., Riserus, U., Lovegrove, J.A., Roche, H.M. & Lopez-Miranda, J. 2013, "A gene variation (rs12691) in the CCAT/enhancer binding protein α-modulates glucose metabolism in metabolic syndrome", Nutrition, Metabolism and Cardiovascular Diseases, vol. 23, no. 5, pp. 417-423.

Dr Scott Harding (King's College London)

Lecturer in Nutritional Sciences

Research Team Members:
Prof Peter Ellis, Prof Kevin Whelan, Dr Louise Goff

Research Interests:
Mechanisms which drive both response and non-response of nutritional interventions in humans for preventing disease and reducing risk factors.

Expertise Sought:
Human clinical trial, stable isotope techniques for determining rate of cholesterol, fat and glucose synthesis in humans, risk factor analysis for diseases such as type 2 diabetes and cardiovascular disease

Expertise Offered:
We are a multi-disciplinary group with expertise in human nutritional/clinical trails (Harding, Goff, Whelan), stable isotope analysis and analytical biochemistry (Harding), insulin and glucose responses (Goff), gut health and gut microbiota (Whelan) and physical properties of carbohydrate based foods (Ellis), specifically in how these foods are affected by the process of digestion and how they affect the digestion and absorption of other nutrients (Ellis, Harding).

Latest Publications:
The anticancer gene ORCTL3 targets stearoyl-CoA desaturase-1 for tumour-specific apoptosis. Abuali G, Chaisaklert W, Stelloo E, Pazarentzos E, Hwang MS, Qize D, Harding SV, Al-Rubaish A, Alzahrani AJ, Al-Ali A, Sanders TA, Aboagye EO, Grimm S. Oncogene. 2014 Apr 28. doi: 10.1038/onc.2014.93. [Epub ahead of print]
Phytosterols protect against diet-induced hypertriglyceridemia in Syrian golden hamsters. Rideout TC, Ramprasath V, Griffin JD, Browne RW, Harding SV, Jones PJ. Lipids Health Dis. 2014 Jan 6;13:5. doi: 10.1186/1476-511X-13-5.
Consumption of wheat bran modified by autoclaving reduces fat mass in hamsters. Harding SV, Sapirstein HD, Rideout TC, Marinangeli CP, Dona AK, Jones PJ. Eur J Nutr. 2014 Apr;53(3):793-802. doi: 10.1007/s00394-013-0583-x.
Dietary oils and FADS1-FADS2 genetic variants modulate [13C]α-linolenic acid metabolism and plasma fatty acid composition. Gillingham LG, Harding SV, Rideout TC, Yurkova N, Cunnane SC, Eck PK, Jones PJ. Am J Clin Nutr. 2013 Jan;97(1):195-207. doi: 10.3945/ajcn.112.043117.
High basal fractional cholesterol synthesis is associated with nonresponse of plasma LDL cholesterol to plant sterol therapy. Rideout TC, Harding SV, Mackay D, Abumweis SS, Jones PJ. Am J Clin Nutr. 2010 Jul;92(1):41-6. doi: 10.3945/ajcn.2009.29073

Dr Paul Harrow (QMUL)

GI Research Fellow & Registrar
www.kcl.ac.uk/medicine/research/divisions/dns/about/people/Profiles/kevinwhelan.aspx

Research Team Members:
Prof. Kevin Whelan (Dietetics Kings College London) Dr. Andrew (Immunology, Blizard Institute, QMUL) Dr. James Lindsay (Gastroenterology, QMUL)

Research Interests:
Intestinal immunity and barrier function Cruciferous vegetables / brassica Aryl hydrocarbon receptor signalling Dietary influences on intestinal immune function Dietary influences on gut microbiota in health and disease

Expertise Sought:
Experience of measuring and quantifying levels of aryl hydrocarbon receptor ligands in different vegetable based foods Experience of delivering palatable high concentrations of cruciferous vegetables for use in dietary intervention studies

Expertise Offered:
Our study proposes a collaboration between the Department of Immunology at QMUL and the Department of Dietetics in Kings College London to investigate the role of cruciferous vegetables in normal function of the intestinal epithelial immune response. Our group has years of experience and publications in dietary intervention trials and has facilities & experience to prepare & analyse the vegetables for use in this study. We have established links with the Kings Mass Spectometry facility to measure levels of bioactive components of food & humans samples. Our lab at the Blizard is well established as a leading centre of research into immune responses of the gut in health and inflammatory bowel disease. We have close links to the Bart's and The London endoscopy facilities necessary for our proposed study and experience and publications using flow cytometry, immunohistochemistry and the genetic studies required for this proposal.

Latest Publications:
Mechanisms and efficacy of dietary FODMAP restriction in IBS. Staudacher HM, Irving PM, Lomer MC, Whelan K. Nat Rev Gastroenterol Hepatol. 2014
Altered intestinal microbiota and blood T cell phenotype are shared by patients with Crohn's disease and their unaffected siblings. Hedin CR1, McCarthy NE, Louis P, Farquharson FM, McCartney S, Taylor K, Prescott NJ, Murrells T, Stagg AJ, Whelan K, Lindsay JO. Gut 2014
Inflamm Bowel Dis. 2014 Mar;20(3): Fiber in the treatment and maintenance of inflammatory bowel disease: a systematic review of randomized controlled trials. Wedlake L1, Slack N, Andreyev HJ, Whelan K.
Increased production of retinoic Acid by intestinal macrophages contributes to their inflammatory phenotype in patients with Crohn's disease. Sanders TJ, McCarthy NE, Giles EM, Davidson KL, Haltalli ML, Hazell S, Lindsay JO, Stagg AJ Gastroenterology. 2014

Prof Marion Hetherington (University of Leeds)

Professor of Biopsychology
http://medhealth.leeds.ac.uk/profile/1300/947/marion_hetherington

Research Team Members:
Dr Samantha Caton, Sheffield University and Dr Jo Cecil, University of St Andrews

Research Interests:
Child eating behaviour and the development of food preferences

Expertise Sought:
Industry interest in healthy eating in children

Expertise Offered:
We have a custom built infant research laboratory and have conducted studies on infant eating behaviour over the last 4 years funded by EU grants (HabEat and VIVA). We are part of a larger human appetite research unit (HARU) which has facilities to study energy balance, nutrition-cognition relationships and lifespan research.

Latest Publications:
https://www.researchgate.net/profile/Marion_Hetherington/

Dr Albert Koulman (MRC HNR)

Senior Scientist

Research Team Members:
Dr Luke Marny (postdoc, bioinformatics and large scale metabolic profiling), Dr Zoe Hall (postdoc, imaging mass spectrometry), Keith Summerhill (technician, robotics), Jessie Tinsley (technician, large scale fatty acid

profiling), Lee Matthews (technician, high throughput lipid profiling) Ben Jenkins (PhD student, odd chain fatty acid metabolism), Samyyia Ashraf (PhD student, lipid composition of breast milk). Dr James Smith (senior bioinformatician), Dr Julian Griffin (group leader).

Research Interests:
My work is part of the Lipid Profiling and Signalling program of MRC Human Nutrition Research. The primary objective is to understand the roles that dyslipidaemia and lipotoxicity play in the subsequent development of IR and then T2DM on an individual basis. We use metabolomics, especially lipidomics, with other -omic tools to follow the mechanistic changes that accompany the development of IR as a result of over nutrition from macronutrients. My work concentrates on the development and application of lipid profiling techniques to understand the interaction between nutrition and genetics. Through collaboration with David Dunger, Paediatrics Department, University of Cambridge I have developed an automated high-throughput methodology to profile the major lipids in heel prick samples collected from infants and applied this to part the Cambridge Baby Growth Study. The technology provides relative quantitation of ~100 lipids from 3.2mm disc of dried blood spots, and is remarkably robust under standard storage conditions. I am also responsible for large scale project where we combine lipid profiling with epidemiological and genomic studies.

Expertise Sought:
We are looking for collaborators that are interested in the development of infant formula and breast milk composition.

Expertise Offered:
Our research team work on biological mass spectrometry and lipid profiling at HNR and is involved in high-throughput lipid profiling of large and very large sample sets for the study of nutrition, health and disease as well as technology for structural elucidation, quantitation techniques and novel mass spectrometry approaches. The team has been responsible for the analysis of over 45,000 blood plasma samples for fatty acid analysis and over 10,000 blood plasma samples for intact lipids using high resolution mass spectrometry, as well as smaller numbers of tissue extracts in support of research at HNR, the Cambridge community and more generally internationally. The intact lipid profiling method has been modified to be able to work with 3.2mm diameter discs of dried blood spots for studies in collaboration with the paediatrics department of Cambridge university and the MRC Epidemiology unit. This work showed that there are significant differences in the lipid profiles of infants that are breast fed in comparison to formula fed infants. We have extended the intact lipid profiling method to the analysis of human milk, which can now be done directly with milk as a fluid or spotted on paper and stored as dried spots. This work will be taken forward by Samyyia Ashraf, who will start as PhD student in the group in Oct 2014.

Latest Publications:
Koulman, A.; Prentice, P.; Wong, M.C.Y.; Matthews, L.; Bond, N.J.; Eiden, M.; Griffin, J.L.; Dunger, D.B., The development and validation of a fast and robust dried blood spot based lipid profiling method to study infant metabolism, Metabolomics 2014. doi: 10.1007/s11306-014-0628-z
Roberts, L. D.; Koulman, A.; Griffin, J. L., Towards metabolic biomarkers of insulin resistance and type 2 diabetes: progress from the metabolome. The Lancet Diabetes & Endocrinology 2013. doi: 10.1016/S2213-8587(13)70143-8
Wang, L. Y.; Summerhill, K.; Rodriguez-Canas, C.; Mather, I.; Patel, P.; Eiden, M.; Young, S.; Forouhi, N. G.; Koulman, A., Development and validation of a robust automated analysis of plasma phospholipid fatty acids for metabolic phenotyping of large epidemiological studies. Genome medicine 2013, 5, (4), 1-12 doi: 10.1186/gm443.
Ferguson, J. F.; Mulvey, C. K.; Patel, P. N.; Shah, R. Y.; Doveikis, J.; Zhang, W.; Tabita-Martinez, J.; Terembula, K.; Eiden, M.; Koulman, A. et al., Omega-3 PUFA supplementation and the response to evoked endotoxemia in healthy volunteers. Molecular nutrition & food research 2013, 58: 601-13. doi: 10.1002/mnfr.201300368.
Langenberg, C.; Sharp, S.; Forouhi, N.; Franks, P.; Schulze, M.; Kerrison, N.; Ekelund, U.; Barroso, I.; Panico, S.; Tormo, M., et al. Design and cohort description of the InterAct Project: an examination of the interaction of genetic and lifestyle factors on the incidence of type 2 diabetes in the EPIC Study. Diabetologia 2011, 54, (9), 2272-2282 doi: 10.1007/s00125-011-2182-9

Prof Alison Lennox (University of Surrey)
Professor of Public Health Nutrition

Research Interests:

Public health nutrition Dietary intakes

Latest Publications:
E. Casala, C. Matthys, S. P eter, A. Baka, S. Kettler, B. McNultyf, A.M. Stephen, J. Verkaik-Kloosterman, J. Wollgast, R. Berry and M. Roe. Viewpoint: Monitoring and addressing trends in dietary exposure to micronutrients through voluntarily fortified foods in the European Union. Trends in Food Science & Technology (2014) (in press)
Pot GK, Hardy R, Stephen AM. Irregular consumption of energy intake in meals is associated with a higher cardio-metabolic risk in adults of a British birth cohort. Int J Obes (Lond). 2014 Mar 28. doi: 10.1038/ijo.2014.51. [Epub ahead of print]
Fitt E, Cole D, Ziauddeen N, Pell D, Stickley E, Harvey A, Stephen AM. DINO (Diet In Nutrients Out) - an integrated dietary assessment system. Public Health Nutr. 2014 Mar 27:1-8. [Epub ahead of print]
Pot GK, Richards M, Prynne CJ, Stephen AM. Development of the Eating Choices Index (ECI): a four-item index to measure healthiness of diet. Public Health Nutr. 2014 Jan 2:1-7. [Epub ahead of print]
Corder K, van Sluijs EM, Ridgway CL, Steele RM, Prynne CJ, Stephen AM, Bamber DJ, Dunn VJ, Goodyer IM, Ekelund U. Breakfast consumption and physical activity in adolescents: daily associations and hourly patterns. Am J Clin Nutr. 2014 99:361-8..

Prof Petros Ligoxygakis (University of Oxford)

Associate Professor
http://www.bioch.ox.ac.uk/aspsite/index.asp?pageid=587

Research Team Members:
Dr Marcus Glittenberg (postdoc-BBSRC) Dr Magda Atilano (postdoc-EMBO) Dr Ilias Kounatidis (postdoc-ERC) Dr Lihui Wang (postdoc-ERC) Ms Rupal Mistry (doctoral student-NC3Rs) Mr Jiwon Park (doctoral student-University of Oxford) Mr Jack Dorling (doctoral student-Wellcome Trust) Mr Peter Burns (technician-ERC)

Research Interests:
Immunity, inflammation, neurodegeneration, host-pathogen interaction

Expertise Sought:
Diet experts (prevention of inflammation/neurodegeneration through diet), medics interested in using model systems (mice, flies, worms) for inflammation

Expertise Offered:
Five PhD students have graduated from the lab since its establishment in 2005. Currently the group contains four post-doctoral researchers (two of them funded by ERC, one by BBSRC, one by EMBO), three PhD students (funded by NC3Rs, the Wellcome Trust and the University of Oxford), and a part-time technician. Their skills encompass Drosophila genetics, microbiology, biochemistry, cell culture and standard molecular biology. 2-3 Oxford undergraduates or Erasmus students join us each year. Together the group has a good range of expertise that promotes both research and training.

Latest Publications:
Loss of Trabid, a New Negative Regulator of the Drosophila Immune-Deficiency Pathway at the Level of TAK1, Reduces Life Span. Fernando, MDA, Kounatidis, I and Ligoxygakis, P (2014) PLOS Genetics doi: 10.1371/journal.pgen.1004117
Bacterial autolysins trim cell surface peptidoglycan to prevent detection by the Drosophila innate immune system. Atilano ML, Pereira PM, Vaz F, Catalão MJ, Reed P, Grilo IR, Sobral RG, Ligoxygakis P, Filipe SR (2014) elife e02277. doi: 10.7554/eLife.02277

Dr Lisa Methven (University of Reading)

Lecturer
http://www.reading.ac.uk/food/about/staff/l-methven.aspx

Research Team Members:
Dr Rachel McCloy, Professor Richard Tiffin

Research Interests:
Sensory and Consumer Science of Foods Variations in Sensory Perception and Sensory Preferences

Mechanisms of variation in sensory perception Under-nutrition in Older Adults Flavour science

Expertise Offered:
Food Choice model : the impact of sensory preferences, cognitive biases and socio-economic factors

Latest Publications:
Allen V.J, Withers C, Methven, L. Gosney, M.A., Validation of a newly devised method to determine taste detection thresholds in older adults Food quality preference, in press.
Tsikritzi, R., Moynihan, P.J., Gosney, M.A., Allen,V.J., Methven,L. (2014) The effect of macro and micro-nutrient fortification of biscuits on their sensory properties and on hedonic liking of older people, JSFA, DOI: 10.1002/jsfa.6522
Withers, C., Methven, L., Qannari, E.M., Allen, V.J., Gosney, M.A. and MacFie, H.J.H. (2014) Taxonomic free sorting: a successful method with older consumers and a novel approach to preference mapping. JSS, doi:10.1111/joss.12093
Withers, CA., Lewis, MJ., Gosney, MA., and Methven L. (2014) Potential sources of mouth drying in dairy beverages; a comparison of casein and whey rich ingredients. J Dairy Sci, in press
Hough, G., Methven, L. and Lawless, H.T. (2013) Survival analysis statistics applied to threshold data obtained from the ascending forced-choice method of limits. Journal of Sensory Studies 28, 414–421
Withers C.A., Cook M.T., Methven L, Gosney, M.A.and Khutoryanskiy V.A. (2013). Investigation of milk proteins binding to the oral mucosa, Food & Function, 4, 1668-1674. doi: 10.1039/C3FO60291E

Dr Keshavan Niranjan (University of Reading)

afsniran@reading.ac.uk

Research Team Members:
Dr Ian Wilson, University of Cambridge

Research Interests:
Creating solid, liquid and emulsion based food foams, and examining their characteristics, stability and mouth-feel. Also high pressure processing of foods, deep fat frying and food packaging.

Expertise Sought:
Dr Ian Wilson of Cambridge is a collaborator and he will give a two-slide presentation of a research project we plan to develop.

Expertise Offered:
At the University of Reading, we have processing and process engineering expertise in: 1. creating, examining, and analysing the properties of foams, particularly linking foam creating conditions with characteristics such as overrun, bubble size distribution, texture and mouth-feel; 2. deep fat frying - examining ways to lower oil uptake particularly by subjecting products to low pressure after withdrawal from frying oil; undertake vacuum frying at lower temperatures to lower acrylamide formation 3. develop compostible or biodegradable food packaging solutions particularly containing antimicrobial coatings for extending product shelf life.

Latest Publications:
1. Junqueira-Gonçalves, M.P., Alarcón, E., Niranjan, K. Post-consumer Recycled PET Packaging for Fresh Berries: A Comparative Study between Incorporating an Antifungal Agent Superficially and into the Main Body of the Packaging (2014) Food and Bioprocess Technology PP. 1 - 8 doi: 10.1007/s11947-014-1262-5
2. Al-Khusaibi, M., Gordon, M.H., Lovegrove, J.A., Niranjan, K. Provenance of the oil in par-fried French fries after finish frying (2012) Journal of Food Science 77 (1) PP. E32 - E36 doi: 10.1111/j.1750-3841.2011.02460.x
3. Jimenez-Junca, C.A., Gumy, J.C., Sher, A., Niranjan, K. Rheology of Milk Foams Produced by Steam Injection (2011) Journal of Food Science 76 (9) PP. E569 - E575 doi: 10.1111/j.1750-3841.2011.02387.x
4. Tarmizi, A.H.A., Niranjan, K. The Possibility of Lowering Oil Content of Potato Chips by Combining Atmospheric Frying with Postfrying Vacuum Application (2010) Journal of Food Science 75 (9) PP. E572 - E579 Cited 3 times. doi: 10.1111/j.1750-3841.2010.01819.x
5. P. Mayachiew, S.Devahastin, B. M. Mackey and K. Niranjan Effects of drying methods and conditions on antimicrobial activity of edible chitosan films enriched with galangal extract (2010) Food Research International, 43, 125-132

Mr Jacob Pattem (Centre for Oral Health Research (COHR) Newcastle University)

Researcher
http://www.ncl.ac.uk/cohr/

Research Team Members:
Dr. Matthew German, Dr. Paula Waterhouse, Professor Paula Moynihan

Research Interests:
My research interests focus on the fundamental mechanisms of dental (human enamel and dentine) erosion via dietary acids (soft and fruit-based drinks). Apart from this, my research involves discovering and incorporating novel agents into soft and fruit-based drinks to arrest or reduce dental erosion. To determine the effect of dietary acids upon enamel and dentine erosion I use atomic force microscopy to monitor the mechanical and morphological properties of these tissues in vitro, on the nano-scale. Including, the effect novel arresting agents incorporated into dietary acid drinks upon morphology and mechnical properties of these dental hard tissues. Apart from arresting dietary acid induced dental hard tissue erosion, formulations of metallo-organics and fluoride based solutions to potentially re-mineralise acid eroded tooth structures, which are also incorporated into drinks.

Expertise Sought:
Current formulations and potential products (acidic drinks) that are less damaging to dental hard tissue structures.

Expertise Offered:
Professor Paula Moynihan: - Professor in Nutrition and Oral Health and Director of the Centre for Oral Health Research. She is also Director of the World Health Organization Collaborating Centre for Nutrition and Oral Health. Prof. Moynihan provides expertise on nutrition and the clinical effects of dental erosion.
Dr. Paula Waterhouse: - Clinical Lecturer in Child Dental Health at Newcastle. Dr. Waterhouse provides expertise in child dental health including aging populations dental health focussing on hydration for the elderly.
Dr. Matthew German: - Lecturer in Dental Materials, providing expert knowledge on AFM quantiotative imaging on the nanoscale (mechanical and morphological properties at the same time).

Latest Publications:
(Draft in Publication) First Author: "Developing a new sequential polishing methodology to remove the smear layer on mineralised tissue structures after rotary instrumentation: An atomic force and scanning electron microscopy investigation". Submitting to Journal of Dental Sciences
(Draft in Publication) First Author: “Development of a new surface roughness characterisation parameter in predicting future wear: An Atomic Force Microscopy Investigation.” Submitting to Journal of Materials Processing

Dr Paul Sharp (King's College London)

Senior Lecturer

Research Team Members:
Yemisi Latunde-Dada; Peter Ellis; Christopher Corpe (all KCL) Surjit Srai (UCL)

Research Interests:
Intestinal nutrient absorption (primarily minerals and sugars) and its regulation by bioactive compounds. In vitro models to study tissue-specific effects of bioactives on mineral and sugar metabolism

Expertise Sought:
Food structure/processing Measurement of metabolites Human intervention studies

Expertise Offered:
We are interested in how polyphenols regulate the bioavailability of iron and glucose. Our work uses in vitro cell culture models to study mechanisms of action in different cell types. We have studies the acute effects of polyphenols on nutrient transport and have found that polyphenols modify the rate of transport by chelating metals and physically interacting with the transporter proteins (competitive and non-competitive inhibition). Our longer-term studies indicate that polyphenols also modify mRNA and protein expression of a number of nutrient

transporters and we are currently investigating the molecular basis for these diet-gene interactions.

Latest Publications:
Lesjak M., Hoque R., Balesaria S., Skinner V., Debnam E.S., Srai S.K. and Sharp P.A. Quercetin inhibits intestinal iron absorption through decreased ferroportin expression. PLoS One (in revision).
Christides T. and Sharp P.A. (2013) Sugars increase non-heme iron bioavailability in human epithelial intestinal and liver cells. PLoS One 8(12), e83031.
Alzaid F., Cheung H-M., Preedy V.R. and Sharp P.A. (2013) An anthocyanin-rich berry extract modulates the expression of intestinal glucose transporter genes and glucose uptake by human intestinal Caco-2 cells. PLoS One 8(11), e78932.

Dr Sandrine Thuret (King's College London)

Lecturer and head of the Nutrition, Neurogenesis and Mental Health Laboratory
http://www.kcl.ac.uk/iop/depts/neuroscience/research/centres/ccbb/groups/nnmh/about.aspx

Research Team Members:
See Nutrition, Neurogenesis and Mental Health Laboratory website link for names of lab members.

Research Interests:
I am the head of the Nutrition, Neurogenesis and Mental Health Laboratory and we are interested in the impact of diet on mood and cognition, and in particular how the birth of new neurons (neurogenesis) in adulthood mediates the effect of diet on mental health. Neurogenesis is a sparse event in the adult brain and adult hippocampal neurogenesis (AHN) decreases with age and low mood whereas an increase in AHN is associated with improved learning/memory and mood. Therefore, AHN emerges as an advantageous target for counteracting the effect of ageing and stress and thus preventing cognitive and mood decline. Others and my lab have shown that diet can modulate AHN and impact on mental health.

Expertise Sought:
I would be glad to discuss possible collaborations with colleagues studying the human gut microbiome to explore a gut-brain-axis hypothesis in the context of dietary modulation of neurogenesis and mental health.

Expertise Offered:
We investigate the molecular mechanisms governing neurogenesis by using human neural stem cells and we use the mouse as animal model to study cognition and mood. We perform a wide range of molecular biology and histology techniques with both in vivo and in vitro models. We are currently studying the molecular mechanisms by which environment (i.e. diet) and diseases (i.e. Alzheimerâ€™s Disease) impacts on neurogenesis and subsequently affect cognition and mood. We can assess in vitro the direct neurogenenic effect of dietary compounds on human neural stem cells, but recently we have also developed an in vitro model of human neurogenesis to assess the effect of the systemic milieu of live human participants. This is used as a biomarker assay to follow patients with Alzheimerâ€™s Disease or depression and to predict treatments response by monitoring neurogenesis. This assay can also be used before, during and after dietary intervention to investigate and monitor the neurogenenic effect of the diet of interest in human participants.

Latest Publications:
Tytus Murphy, Gisele Pereira Dias, and Sandrine Thuret, Effects of Diet on Brain Plasticity in Animal and Human Studies: Mind the Gap, Neural Plasticity, in press, doi:10.1155/2014/56316
A. Maruszak, A. Pilarski, T. Murphy, N. Branch and S. Thuret (2013). Hippocampal neurogenesis in Alzheimer's disease: is there a role for dietary modulation? The Journal of Alzheimer Disease. 38(1):11-38 Doi: 10.3233/JAD-131004
C. Anacker, A. Cattaneo, K. Musaelyan, P. A. Zunszain, M. Horowitz, R. Molteni, A. Luoni, F. Calabrese, K. Tansey, M. Gennarelli, S. Thuret, J. Price, R. Uher, M. A. Riva, C. M. Pariante. Role for the kinase SGK1 in stress, depression, and glucocorticoid effects on hippocampal neurogenesis. (2013). PNAS 110(21):8708-13. doi: 10.1073/pnas.1300886110
G. P. Dias; N. Cavegn, A. Nix, M.C.N. Bevilqua, D. Stangl, M.S.A. Zainuddin, A.E. Nardi, P.F. Gardino, S. Thuret. The role of dietary polyphenols on adult hippocampal neurogenesis: molecular mechanisms and effects on depression and anxiety (2012). Oxidative Medicine and Cellular Longevity, vol. 2012, Article ID 541971, 18 pages, 2012.
Zainuddin M.S. and S. Thuret. Nutrition, Neurogenesis and Mental Health. British Medical Bulletin (2012). doi: 10.1093/bmb/lds021.

Dr Pretima Titoria (Leatherhead Food Research)

Consultant: Food Ingredients

Research Team Members:
Wayne Morley, Persis Subramaniam, Kathy Groves, Rachel Wilson, Marina Andres-Brull

Research Interests:
Ingredient characterisation and applications, product development, new concept development, product quality and shelf life stability, pilot plant, chemical analysis, microbiological assessment, nutrition, regulation.

Expertise Sought:
Open to all

Expertise Offered:
Leatherhead Food Research delivers integrated scientific expertise and international regulatory advice to the global food, drink and related industries.Our offerings are structured according to five main service platforms: 1. Regulatory Services: Leatherhead Food Research provides a regulatory advisory service offering global support spanning over 100 countries. 2. Food Innovation: Focusing on food ingredients and product formulation, our Food Innovation service embraces the whole food innovation cycle - from concept, to development, to scale-up, through to scientific sensory and consumer assessment of final products. 3. Sensory & Consumer: Our Sensory & Consumer team offers sensory evaluation and consumer insight research to the food and drink industry. 4. Nutrition: The Nutrition service offers research on nutrition and human health. 5. Food Safety: Leatherhead Food Research has a dedicated Food Safety team conducting ongoing research into food safety. Leatherhead Food Research's Food Innovation Platform can provide you additional support or outsourced research projects through Open Innovation and Partnerships. We can support you through all stages of product development from idea generation and prototype development, to post-launch product monitoring and maintenance, and shelf life determination. We can help you develop a wide range of product types, ranging from beverages to confectionery, and desserts to savoury products.

Latest Publications:
Titoria, P., Aragoneses, C. & Groves, K. (2010) Alternatives to chemically-modified starches Leatherhead Food Research Publication. Accession No 823131
Titoria P.M., Aragoneses C., Villalba M (2011) Exploitation of hydrocolloid functionality for healthiness. (Hydrocolloids for satiety.) Leatherhead Food Research Publication. Accession No 823130
Titoria, P.M. & Groves, K. (2012) The effect of aeration on solid product characteristics. Leatherhead Food Research Report No956
Titoria, P.M., Andres-Brull, M., Hull, S. & Brzezinski, J. (2012) The effect of microstructure on satiety.

Prof Antonio Vidal-Puig (University of Cambridge)

Prof of Molecular Nutrition
http://tvp.mrl.ims.cam.ac.uk/

Research Team Members:
Sergio Rodriguez Cuenca and Sam Virtue

Research Interests:
Working in Obesity and associated complications with a focus on lipid metabolism and the relevance of lipotoxicity mediating metabolic complication. Interested in mechanisms controlling energy dissipation as a strategy to prevent lipotoxicity and the relevance of nutrients controlling this process. Finally I am interested in qualitative effects of lipid species and their metabolic effects

Expertise Sought:
Trying to link our programme of research to food/nutrient related companies interested in translation supported by strong mechanistic studies of nutrient molecular mechanisms interactions

Expertise Offered:
My lab is strong in a) Murine physiology related to metabolism, energy balance and metabolic complications b) Cell biology studies related to c) Human studies related to energy balance, weight loss and energy dissipation. d) Systems biology approaches applied to murine and cellular models focused on lipid pathways.

Latest Publications:
Carobbio S, Hagen RM, Lelliott CJ, Slawik M, Medina-Gomez G, Tan CY, Sicard A, Atherton HJ, Barbarroja N, Bjursell M, Bohlooly-Y M, Virtue S, Tuthill A, Lefai E, Laville M, Wu T, Considine RV, Vidal H, Langin D, Oresic M, Tinahones FJ, Fernandez-Real JM, Griffin JL, Sethi JK, Lapez M, Vidal-Puig A. Adaptive changes of the Insig1/SREBP1/SCD1 set point help adipose tissue to cope with increased storage demands of obesity. Diabetes 2013 Aug 6. [Epub ahead of print]
Virtue S, Even P, Vidal-Puig A. Below Thermoneutrality, Changes in Activity Do Not Drive Changes in Total Daily Energy Expenditure between Groups of Mice. Cell Metab Nov 7;16(5):665-71 (2012)
Virtue S, Feldmann H, Christian M, Tan CY, Masoodi M, Dale M, Lelliott C, Burling K, Campbell M, Eguchi N, Voshol P, Sethi JK, Parker M, Urade Y, Griffin JL, Cannon B, Vidal-Puig A. A new role for Lipocalin Prostaglandin D Synthase in the regulation of brown adipose tissue substrate utilisation. Diabetes 61(12):3139-47 (2012).
Whittle AJ, Carobbio S, Martins L, Slawik M, Hondares E, VÃ¡zquez MJ, Morgan D, Csikasz RI, Gallego R, Rodriguez-Cuenca S, Dale M, Virtue S, Villarroya F, Cannon B, Rahmouni K, LÃ³pez M, Vidal-Puig A. BMP8B Increases Brown Adipose Tissue Thermogenesis through Both Central and Peripheral Actions. Cell. 2012 May 11;149(4):871-85

Prof Caroline Wheeler Jones (Royal Veterinary College)

Chair of Vascular Cell Biology
http://www.rvc.ac.uk/Research/Programmes/Lifestyle/Index.cfm;http://www.rvc.ac.uk/Staff/cwheeler.cfm

Research Team Members:
Dr Wendy Hall (KCL); Dr Anna Nicolaou (Manchester); Dr David Bishop-Bailey (RVC) (Current DRINC-funded laboratory team: Dr Sally Latham; Mr Rob Purcell)

Research Interests:
Vascular cell biology ~ major focus on endothelial cell signalling and function (but also working on vascular smooth muscle, monocytes/macrophages and their interactions) Angiogenesis and mechanisms of tissue repair and maintenance Dietary lipoproteins and impact on vascular cell function Molecular control of vascular homeostasis Circulating angiogenic cells in humans.

Expertise Sought:
I would welcome talking to industry members/academic members who are interested in identifying the relative vascular health benefits of LC n-3 polyunsaturated fatty acids from sustainable sources.

Expertise Offered:
Caroline Wheeler-Jones' lab has expertise in the isolation and use of primary human and animal endothelial cells and other vascular cell types and in delineating the molecular signalling mechanisms controlling gene expression and endothelial cell/vascular cell functions relevant for inflammation, tissue repair and angiogenesis (e.g. cell motility and migration; assessments of angiogenic potential (and in animal models in vivo); isolation and functional analysis of circulating progenitor/angiogenic cell populations. Paracrine and autocrine signalling mechanisms involved in cell:cell interactions are also a current interest. The research team focused on the current DRINC project have long-standing expertise in the isolation, characterisation and investigation of the functional impact of dietary lipoproteins of different compositions on vascular cells (endothelial cells; macrophages; primary human monocytes). The team uses a wide range of standard biochemical and molecular cell biology techniques (primary human and murine endothelial cell isolation and culture, quantitative PCR, immunoblotting, siRNA knockdown, confocal microscopy, cytokine analysis, preparation, FACs, analysis of physiological lipoproteins and characterisation of model chylomicron remnant-like lipoproteins etc) alongside functional assays in human and murine cells (proliferation, apoptosis, in vitro, ex vivo and in vivo assays of angiogenesis; lipid uptake; cell:cell interactions etc). Expertise in the design and execution of human feeding studies is provided through an established and close collaboration with Dr Hall (Diabetes and Nutritional Sciences Division, King's College London).

Latest Publications:
Fortunato T, Vara D, Wheeler-Jones CPD*, Pula G*. Expression of protease-activated receptor 1 and 2 and anti-vasculogenic activity of protease-activated receptor 1 in human endothelial colony-forming cells (under review; *co-senior).
Purcell R, Latham S, Botham KM, Hall, WL, Wheeler-Jones CPD. High-fat meals rich in EPA plus DHA versus DHA only have differential effects on postprandial lipemia and plasma 8-isoprostane F2 concentrations

compared to a control high-oleic acid meal: a randomized controlled trial (under review)
Bishop-Bailey D, Thomson S, Askari A, Faulkner A, Wheeler-Jones C. Lipid-Metabolizing CYPs in the Regulation and Dysregulation of Metabolism. Annual Review of Nutrition (in press).
Botham KM, Wheeler-Jones CP. Postprandial lipoproteins and the molecular regulation of vascular homeostasis. Prog Lipid Res. 2013 52(4):446-64.
Wheeler-Jones CP, Clarkin CE, Farrar CE, Dhadda P, Chagastelles P, Nardi N, Jones PM. Endoglin (CD105) is not a specific selection marker for endothelial cells in human islets of Langerhans. Diabetologia. 2013 56(1):222-4.

Prof Robin Williams (Royal Holloway)

Prof of Molecular Cell Biology
https://pure.royalholloway.ac.uk/portal/en/persons/robin-williams%28f59210ed-f7c6-4b50-a29c-05c861d4b6c1%29.html

Research Interests:
Our research has employed a simple, non-animal model to identify and characterize the effects of a range of compounds, including a range of food stuffs. Our model provides access to experimental approaches that are not possible using animal models, that have allowed significant advances in understanding the molecular targets and mechanisms of compounds. We have demonstrated that our discoveries are also translatable to animal/human models

Expertise Sought:
We are seeking industrial collaborators and financial support for studies into the molecular targets and mechanisms of food components.

Expertise Offered:
Prof Williams is a highly successful expert using the non-animal model system Dictyostelium in a range of biomedical projects. Using this model, he has recently published papers concerning the discovery of: a (human) molecular target for the bitter standard phenylthiourea (Robery et al., 2013); a (mammalian) molecular target for the bitter flavonoid naringenin (Waheed et al., 2013); and a molecular mechanism of the bitter medicant valproic acid (Chang et al., 2012; Chang et al., 2013; Chang et al., 2014; Walker and Williams, 2013; Xu et al., 2007). From these studies, he has a clear record of identifying novel mechanisms of bitter compounds. He will bring these skills and approaches into this collaborative research project.

Latest Publications:
Ludtmann, Otto, Schilde, Chen, Allan, Brace, Beesley, Kimmel, Fisher, Killick, and Williams (2014) An ancestral non-proteolytic role for presenilin proteins in multicellular development of the social amoeba Dictyostelium discoideum. Journal of Cell Science. 127(7):1576-84.
Chang, Walker and Williams (2013) Seizure-induced reduction in PIP3 levels contributes to seizure-activity and is rescued by valproic acid. Neurobiology of Disease. Joint corresponding author. 62C:296-306 43
Waheed, Ludtmann, Pakes, Robery, Kuspa, Dinh, Baines*, Williams* and Carew* (2013) Naringenin inhibits the growth of Dictyostelium and MDCK-derived cysts in a polycystin-2 (TRPP2)-dependent manner. British Journal of Pharmacology.171(10):2659-70. *Joint last author. joint corresponding author.
Walker and Williams (2013) The search for better epilepsy treatments: from slime mould to coconuts. Biochem. Soc. Trans. 41(6):1625-8
Robery, Tyson, Dinh, Kuspa, Noegel, Bretschneider, Andrews, and Williams (2013) A novel human receptor involved in bitter tastant detection identified using the model organism Dictyostelium discoideum. Journal of Cell Science, 126(23):5465-76

Dr Ian Wilson (University of Cambridge)

Reader
http://www.ceb.cam.ac.uk/research/groups/rg-p4g

Research Team Members:
Cambridge: Dr Bart Hallmark, Dr Loly Torres Perez Reading: Prof. Keshavan Niranjan

Research Interests:
Food process engineering, ranging from processing of particulates and soft solids to heat transfer and process

hygiene. We have particular expertise in rheology; extrusion of viscoplastic and viscoelastic materials; particle technology; fouling and cleaning of process equipment. Our work includes experimental and detailed numerical modelling.

Expertise Sought:
We are particularly looking for industrial collaborators who would be able to help define, and apply results from, a project arising from recent investigations on the rheology of bubbly liquids with non-Newtonian liquid phases.

Expertise Offered:
The Cambridge group work on the processing of microstructured soft solids, including polymers and polymer solutions, suspensions, pastes, and bubbly liquids (aerated liquids or suspensions with moderate air content, i.e. not foams). Many of the materials studied are foodstuffs or precursors for food products. A key aim is understanding how processing conditions and formulation determine microstructure in the product. There is particular emphasis on quantitative modelling and measurement. The group at Reading work on a range of food processing technologies, both in terms of understanding microstructure-processing relationships (as at Cambridge) and in their nutritional and organoleptic characteristics. Both groups have worked on aerated foods, such as cake batters, in recent years, and this has led us to propose a colloborative project in this area.

Latest Publications:
Torres, M.D., Hallmark, B. and Wilson, D.I. (2014) Effect of concentration on shear and extensional rheology of guar gum solutions, Food Hydrocolloids [10.1016/j.foodhyd.2014.02.011], 40, 85-95. M.D.
Torres, F. Gadala-Maria and D.I. Wilson (2013) Comparison of the rheology of bubbly liquids prepared by whisking air into a viscous liquid (honey) and a shear-thinning liquid (guar gum solutions), J. Food Eng., 118, 213-228 [dx.doi.org/10.1016/j.jfoodeng.2013.04.002].
Chesterton, A.K.S, Pereira de Abreu, D.A., Moggridge, G.D., Sadd, P.A. and Wilson, D.I. (2013) Evolution of cake batter bubble structure and rheology during planetary mixing, Food & Bioproducts Processing, 91, 192-206. [doi 10.1016/j.fbp.2012.09.005].

Jimenez Junca, C. A., Gumy, J. C., Sher, A. and Niranjan, K. (2011) Rheology of milk foams produced by steam injection. Journal of Food Science, 75 (9). E569-E575. ISSN 1750-3841 doi: 10.1111/j.1750-3841.2011.02387.x
Silva, C., Livings, S., Sher, A. , Niranjan, K., Espiga, A. and Gumy, J.-C. (2008) Formation and stability of milk foams. In: Campbell, G.M., Scanlon, M.G. and Pyle, D.L. (eds.) Bubbles in food 2: novelty, health, and luxury. AACC International , St. Paul, Minnesota, pp. 153-161. ISBN 9781891127595

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