



**INTESTINAL
HEALTH
CONSORTIUM**



Visualising gut microbes- courtesy of NCIMB -
courtesy of NCIMB
Molecular analysis using taqMan at CCFRA



AIMS and OBJECTIVES

The vision of this project is to extend our knowledge of the role of gut bacterial biofilms in both healthy individuals and those who suffer from various intestinal disorders. This will advance our understanding and treatment of various human gut disorders, specifically, ulcerative colitis (UC), Crohn's disease and irritable bowel syndrome (IBS).

The ultimate aim of this project is to develop new tools for designing and validating more effective foods or food additives to improve intestinal health in the population as a whole. By using an in vitro laboratory based biofilm model system to study the role of "natural" or "beneficial" effects of both foods and microorganisms, it is our goal to deliver improved dietary and clinical intervention strategies aimed at preventing the onset of some or all of the above disorders as well as developing more effective treatment strategies. For example, the use of targeted probiotics may lead to the exclusion of groups of putative disease causing organisms and restore a "health balance" to the gut. These biofilm models will allow potential treatment strategies to be developed prior to clinical or food based trials.

BACKGROUND

It is estimated that acute and chronic disorders of the large bowel affect between 10 and 20% of adults in the Western world. In the UK alone, it is estimated that inflammatory bowel diseases cost the Health Service between 0.5 to 1 billion pounds per annum in terms of GP referrals and hospital treatment. In the USA, treatment of Crohn's disease and ulcerative colitis costs in excess of \$1 billion and \$ 0.6 billion respectively. However, little is known about the initial cause of most of these disorders and hence how best to treat them. Most current treatment regimes treat the symptoms rather than the cause and can involve the use of powerful anti-inflammatory drugs which have unpleasant side effects.

THE MARKET

The market for gut beneficial foods is colossal and growing rapidly. Total sales across key European markets, the USA, Japan and Australia are worth \$3.5 billion and are forecast to climb to \$4.6 billion by 2005. (Taken from "The market for gut benefit Foods - a global analysis." Published by Leatherhead Food International, 2001.)



TECHNICAL APPROACHES TO THE PROJECT

- **State of the art review**
 - intestinal microflora and factors which affect its composition
 - detection techniques for gut microorganisms
 - define diseases/disorders to be investigated
 - effectiveness of currently available pre and probiotics
 - biofilm models – what is currently available and what is required
- **Develop laboratory biofilm generator (model system for gut biofilms)**
- **Develop bacterial monitoring and identification tools such as fluorescent and molecular markers for experimentation within gut biofilm model systems to study :**
 - role of specific organisms in the gut microflora
 - location of target organisms
 - response to treatment regimes
- **Use biofilm generator to develop putative treatment regimes aimed at modifying the gut flora in terms of either removal of, or re-colonising with, specific groups of bacteria.**
 - e.g. effect of diet, probiotics and other therapies
- **Select appropriate foods or other vectors to deliver therapeutic agents to target site(s) and define delivery strategies and delivery mechanisms**
- **Develop new food product opportunities**

THE TEAM

The project will be a collaboration between three commercial organisations and a key academic specialist.

NCIMB LTD

Is the leading National Culture Collection for food and environmental bacteria and has a sound track record on laboratory biofilm work.

ROWETT RESEARCH SERVICES LTD

Is a world renowned institution for nutritional research and has access to some potentially novel probiotic bacteria.

CAMPDEN & CHORLEYWOOD FOOD RESEARCH ASSOCIATION (CCFRA)

An international membership-based organisation providing expertise in science and technology for the food and drink industries worldwide.

PROFESSOR GEORGE MACFARLANE, DUNDEE UNIVERSITY

Is a leading academic in the field of gastrointestinal microbiology. He has published several reviews of the bacteriology of GI diseases and has an active research team at Ninewells Hospital.

This team has been brought together to harness the necessary range of skills to discharge the aims of the project. Expertise in areas of human gut microbiology, laboratory biofilm generation, state of the art molecular and microscopic technologies and food encapsulation and delivery systems will all contribute towards the development of new or novel treatment protocols as part of 21st century healthcare.



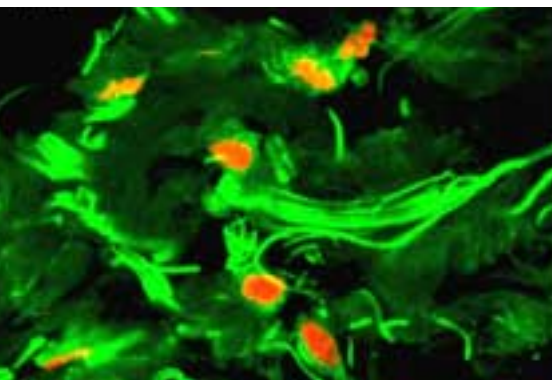
Industrial biofilm generator at NCIMB

Fermentation vessels containing human gut bacteria - courtesy of the Rowett Research Institute





Diseased colon removed from a UC patient -
courtesy of George Macfarlane



Spirochaetes on the mucosal surface in the upper large
bowel - courtesy of George Macfarlane

BENEFITS TO SPONSORS

- Opportunity, under license, to become directly involved in the manufacture and or sale of food, healthcare or clinical products derived from the research
- Right to use Biofilm generator tools
- License to use IPR in specified Fields
- Positive publicity associated with the financial support of a major healthcare R&D programme
- Firsthand access to evolving research data

PROJECT MANAGEMENT

- The project will be managed by NCIMB
- There will be regular project meetings and reporting to sponsors.
- Sponsors will have the right to send up to two delegates to each project meeting and will benefit from the exchanges at these meetings.

INDUSTRIAL COLLABORATION AND SUPPORT

- Sponsors and the collaborating partners will form a project steering committee which will determine and approve the scope of work for each work period.
- Sponsors will receive all project results and carefully defined intellectual property rights for their area of application, that can be negotiated on a case by case basis. There will be no publication of any results from the project allowed unless agreed by the Steering Committee. All data will remain confidential.

This brochure is designed to give brief details on the outline scope of the proposal, if you would like further information, please contact:

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