

Probiotic Bulletin

AN UPDATE FOR HEALTHCARE PROFESSIONALS

The International Dairy Federation Elie Metchnikoff Prize 2010

This prize is an initiative from the International Dairy Federation (IDF) in partnership with the Institut Pasteur and the International Scientific Association for Probiotics and Prebiotics (ISAPP), a partnership created to help promote research on fermented milks in the field of microbiology, biotechnology, nutrition and health. Previously given in 2007, the prize is in memory of the Nobel Prize winner Professor Elie Metchnikoff, the scientist who famously inspired the probiotic concept in his thesis *'The Prolongation of Life'* in which he proposed that there could be health benefits from ingesting live bacteria.

Yakult is proud to be one of the sponsors of this award, which is given to scientists who have made outstanding discoveries into lactic acid bacteria and probiotics in fermented milks and the contribution of fermented milks to human nutrition, health and longevity.

The winners were announced at the IDF Symposia on Science and Technology of Fermented Milk and on Microstructure of Dairy Products in Tromsø, Norway, on 9 June 2010. Further information can be found at www.idfeliemetchnikoffprize2010.com

Our congratulations to (left to right):
Prof Colin Hill, Dr Catherine Stanton,
Prof Gerald Fitzgerald, Prof Paul Ross

The Elie Metchnikoff prize 2010 winners (3 categories)

Microbiology

PROF PAUL ROSS, DR CATHERINE STANTON, PROF GERALD FITZGERALD, PROF COLIN HILL (IRELAND)

For their work into elucidating the mechanistic basis of lactic acid bacteria and probiotic functionality.

Nutrition & Health

PROF SEPPO SALMINEN & PROF ERIKA ISOLAURI (FINLAND)

For their work on probiotics in dairy products as novel tools to fight Western life-style diseases.

Biotechnology

PROF TODD KLAENHAMMER (USA)

For his work investigating the industrial application of molecular genetics to food-grade lactic acid bacteria.



Free resources on *L. casei* Shirota



Yakult has produced a useful new easy-to-search resource for healthcare professionals that edits the complex papers published on its probiotic strain into a more concise and accessible format.

For over 75 years, *Lactobacillus casei* Shirota (LcS), the probiotic strain in Yakult, has been the focus of considerable research, resulting in a broad range of publications on human and mechanistic studies relevant to a range of health conditions. In order to make this research more accessible, Yakult’s science team has summarised key LcS papers and compiled reference lists of papers relating to different areas of interest.

Topics

Topics are listed on one webpage in alphabetical order, grouping together key LcS research papers in different areas of interest. Each Topic gives a full citation of the main relevant LcS research papers, providing hyperlinks (where applicable) to the full text copy of the article, reprint request, the PubMed abstract, conference proceedings or the synopsis.

Synopses

Synopses are one page summaries explaining the main aspects of a study (e.g. objectives, trial design, main findings and authors’ conclusions), written in an objective and simple fashion. In some cases helpful graphs or tables have been included.

Glossary

The glossary includes abbreviations and scientific terms contained in LcS research papers that may not be familiar to all our readers. Clear, comprehensive definitions are provided on an intuitive webpage that makes it easy to navigate around the extensive list.

Available online: this new resource can be found on our healthcare professional website (www.yakult.co.uk/hcp) where each section can be viewed as a webpage or downloaded for free as a printable resource.

The Topics that have been compiled so far include:

- Elderly people
- Gut-related infections
- Inflammatory bowel disease (IBD)
- Irritable bowel syndrome (IBS) & Constipation

This is not an exhaustive list of topics; more will be launched in due course and the online facility will be updated regularly with new LcS research publications. For further information or to access this free resource, visit us at www.yakult.co.uk/hcp or get in touch by emailing science@yakult.co.uk for more details.

The Return of Gut Week

23rd – 29th August

From 23rd – 29th August this year, Gut Week celebrates its 12th anniversary and, as always, will provide a host of digestive tips for everyone via a wide range of media. Throughout the week, the Love Your Gut team will be out across the country, giving advice on gut health in workplaces and hospitals.

The week is supported by the digestive health charities Core and The Gut Trust and also by Yakult. A host of different experts will be available for advice and patients can also be directed to the website loveyourgut.com. This is jam-packed with healthy dishes from top chefs, as well as giving people an opportunity to ask questions in confidence to a medical doctor. Healthcare professionals can email info@yakult.co.uk to bulk order free Gut Week packs.

Would you like to support Gut Week?

Gut Week was set up in 1999 to help people understand the importance of good digestive health. The campaign has now reached over 350 million people in the last eleven years – but we would really like to help, educate and support many more.

Sometimes taking the first step towards seeking help can be inspired by just a simple piece of information – e.g. a poster or a leaflet. If you have a notice board or display area in your workplace, hospital or waiting room and would like some leaflets and posters then simply send an email to info@yakult.co.uk heading your message ‘Gut Week Display’.

Gut Week on the Road

Can we come and visit you? The Gut Week team can visit to offer free digestive health advice. We can bring our digestive health information stand to your workplace, perhaps in a canteen or reception area, and anyone (patients, visitors or members of staff) can come and ask for help and advice – or simply take away some information.

Email info@yakult.co.uk to book a place.



Recent publications of interest

Moayyedi P *et al* (2010) The efficacy of probiotics in the treatment of irritable bowel syndrome: a systematic review. *Gut* 59: 325–332. Irritable bowel syndrome is a difficult area of research due to the heterogeneity of the patients, symptoms, aetiology and biomarkers. Trials with probiotics have sometimes given conflicting results. This review authored by a panel of experts including Professor Eamonn Quigley, identified 19 randomised controlled trials and concluded that probiotics seem to have benefit.

Qin J *et al* (2010) A human gut microbial gene catalogue established by metagenomic sequencing. *Nature* 464: 59–65. Meta-genomics is the study of the whole of the genes of a specific habitat: in this case, the microbes of the human intestine. This large international study, part of the Metagenomic of the Human Intestinal Tract (MetaHIT) consortium analysed DNA from the faeces of 124 European adults (healthy, overweight, obese and with IBD). Over 99% of the genes were bacterial, with the entire cohort harbouring 1,000–1,150 prevalent species; each individual had at least 160 species. This work is important in furthering understanding of the role of different microbes in health and disease.

Rijkers GT *et al* (2010) Guidance for substantiating the evidence for beneficial effects of probiotics: current status and recommendations for future research. *The Journal of Nutrition* 140: (3) 671S–676S. This work was commissioned by the Probiotics Task Force of the ILSI Europe, and was also covered by Dr Rijkers recently at the Rowett-INRA Gut Microbiology conference. The expert group conducted literature reviews in selected areas of benefit (metabolism, IBD, IBS, allergy, infections), identified gaps in research methodology and gave recommendations for trial design and future research.

Rowland I *et al* Report of an expert meeting in London. *Current level of consensus on probiotics science*. 23rd November 2009. This is the outcome from a round table discussion by a group of nine scientists from seven European countries on the level of probiotic evidence in various clinical areas. Topics included probiotics and diarrhoea; probiotics, immunity and infections; probiotics and irritable bowel syndrome; probiotics and inflammatory bowel diseases and probiotics in other clinical conditions. This report is available on the ISAPP website (http://www.isapp.net/docs/Report_of_an_expert_meeting-V7MES.pdf).

Kadooka Y *et al* (2010) Regulation of abdominal obesity by probiotics (*Lactobacillus gasseri* SBT2055) in adults with obese tendencies in a randomized controlled trial. *European Journal of Clinical Nutrition* 64: 636–643. This study investigated whether abdominal adiposity and body weight could be affected in adults with obese tendencies by consumption of *L. gasseri* SBT2055. A significant reduction was observed in abdominal visceral and subcutaneous fat as well as body weight for those taking the probiotic.

Hehemann J *et al* (2010) Transfer of carbohydrate-active enzymes from marine bacteria to Japanese gut microbiota. *Nature* 464: (7290) 908–912. We noticed this research from a piece in The Guardian. *Zobellia galactanivorans* is a bacterial species that lives on the seaweed

used to wrap sushi. The researchers discovered that some of its genes have been passed to other bacteria in the gut of Japanese people (but not North Americans). It seems that the *Zobellia* genes are important in their ability to digest complex carbohydrates in the seaweed, a food which has been eaten in Japan for centuries.

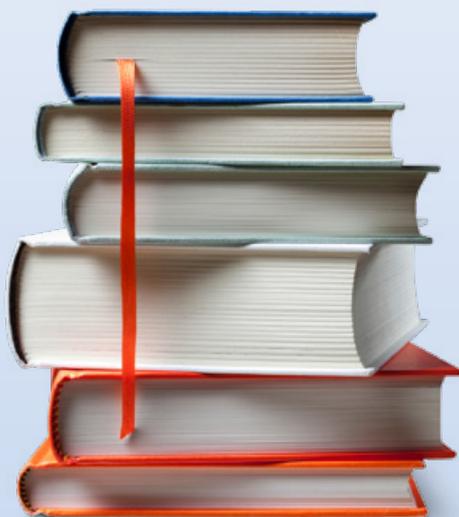
Santacruz A *et al* (2010) Gut microbiota composition is associated with body weight, weight gain and biochemical parameters in pregnant women. *British Journal of Nutrition* 104: 83–92. The faecal microbiota and biochemical plasma parameters of 50 normal and overweight pregnant women were analysed. Women who gained excessive weight during pregnancy had lower numbers of *Bifidobacterium* and *Bacteriodes*, and higher numbers of *Escherichia coli* compared to those with normal weight gain.

Sang LX *et al* (2010) Remission induction and maintenance effect of probiotics of ulcerative colitis: A meta-analysis. *World of Gastroenterology* 16: (15) 1908–1915. This meta-analysis identified 13 randomised controlled trials that studied the effects of probiotics on remission or recurrence rates. It concluded that, generally, probiotics improved remission rates compared to placebo.

Gao XW *et al* (2010) Dose–response efficacy of a proprietary probiotic formula of *Lactobacillus acidophilus* CL1285 and *Lactobacillus casei* LBC80R for antibiotic-associated diarrhea and *Clostridium difficile*-associated diarrhea prophylaxis in adult patients. *American Journal of Gastroenterology* doi: 10.1038/ajg.2010.11 This randomised double-blind, placebo-controlled trial compared different doses of a probiotic given prophylactically to patients within 36 hours of commencing antibiotic treatment and for five days afterwards. A dose-response relationship with the higher dose of the probiotic was associated with a greater reduction in the incidence of antibiotic-associated diarrhoea.

Chmielewska A & Szajewska (2010) Systematic review of randomised controlled trials: probiotics for functional constipation. *World Journal of Gastroenterology* 16: (1) 69–75. Five randomised controlled trials were included in this review of the safety and efficacy of probiotics in clinical trials for constipation. It was concluded that *Bifidobacterium lactis* DN-173010, *Lactobacillus casei* Shirota and *Escherichia coli* Nissle 1917 all showed a favourable effect on stool consistency and defecation frequency in adults. An improvement was also seen with *Lactobacillus casei rhamnosus* Lcr35 in children.

Neu J (Guest editor) (2010) Guidance for Assessing the Probiotics Beneficial Effects: How to Fill the Gap. *Journal of Nutrition* 140: Supplement 3S-1. This supplement (commissioned by an ILSI Probiotics Task Force; available on request from publications@ilsieurope.be) is the outcome of a workshop in Montreux, Switzerland in 2008 organised by ILSI Europe in association with the International Dairy Federation. It comprises five papers giving guidance for substantiating evidence on probiotic benefits: current status and recommendations for future work (Rijkers GT *et al*); effect on digestive system metabolism (Rabot S *et al*); benefits for IBD and IBS (Haller D *et al*); prevention and management of infections (Wolters D *et al*); prevention and management of allergic disease (Källiomaki *et al*).



Research round-up

Systematic review: probiotic safety in nutritional support (Whelan & Myers 2010)

This recent review in the American Journal of Clinical Nutrition examined the safety of probiotics in patients receiving nutritional support such as enteral or parental nutrition. Use of probiotics in this way can be prompted by concern about the risk of diarrhoea associated with enteral feed or antibiotic use, so this exhaustive review is important in weighing current evidence and offering guidance.

A total of 1,966 articles were identified, with 72 fulfilling the authors' inclusion criteria. Of these 20 reported adverse events in 32 patients receiving nutritional support that included probiotics. These studies were tabulated, giving full information on strains, type of delivery, dosage, and outcomes.

Of 53 trials in which 4,131 patients received probiotics, most showed no effect or a positive effect on outcomes relating to safety. Further information on three trials in which there were complications is given: in two of these the probiotic was delivered via postpyloric tube.

The authors concluded that probiotics have been used safely in patients on nutritional support, although an increased risk of complications has been shown in particular patient groups. The paper, particularly the discussion section, contains clear observations and recommendations that healthcare professionals will find valuable.

- Whelan K & Myers CE (2010) Safety of probiotics in patients receiving nutritional support: a systematic review of case reports, randomized controlled trials, and nonrandomized trials. *American Journal of Clinical Nutrition* **91**: 687–703.

For pet lovers (Ogue-Bon *et al* 2010)

The intestinal microbiota of companion animals (i. e. pets) is subject to much the same stresses as humans'. This mini-review discusses the potential of using probiotics, prebiotics and synbiotics in pet food, summarising the current evidence.

An emerging area of interest perhaps, for pet food manufacturers and animal lovers!

- Ogue-Bon E, Gibson G & Rastall RA (2010) The application of probiotics, prebiotics and synbiotics in companion animals. *Food Science & Technology Bulletin* 4th March online.

Biomarkers associated with intestinal microbiota metabolism identified in autistic children (Yap *et al* 2010)

Professor Jeremy Nicholson's research group at Imperial College London conducted this study, which attracted media attention when published.

Children with autism spectrum disorders (ASD) often suffer gastrointestinal problems and appear to have an abnormal gut flora. There have been suggestions that toxic by-products of certain gut bacteria might contribute to ASD, and perhaps even be involved in their aetiology.

In this study, nuclear magnetic resonance spectroscopy was used to compare the urine of children with autism (n = 39), their non-autistic siblings (n = 28) and age-matched healthy controls (n = 34). Analysis of urine samples from children with ASD (and not

the controls) revealed that certain gut bacterial metabolites were increased, which indicated negative changes in some metabolic pathways.

These results have raised suggestions that this chemical signature could be used to diagnose ASD early in life, or to monitor the effects of therapy. It is important, however, that conclusions are not overstated but these are certainly very interesting findings that should be investigated in larger studies. A good summary of this topic can be found in the *New Scientist* online (Geddes 2010).

- Geddes L (2010) Gut bacteria may contribute to autism. *New Scientist* online 7 June, (<http://www.newscientist.com/article/dn19011-gut-bacteria-may-contribute-to-autism.html>).
- Yap IKS, Angley M, Veselkov KA, Holmes E, Lindon JC & Nicholson JK (2010) Urinary metabolic phenotyping differentiates children with autism from their unaffected siblings and age-matched controls. *Journal of Proteome Research* **9**: 2996–3004.

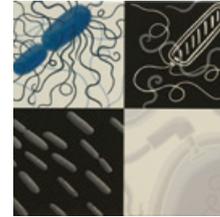
Manchester Metropolitan University (MMU): Microbiology & Art

Hannah Baker,
Yakult UK



BELOW: "A Clockwork Orange" – *Staphylococcus aureus* on milk agar, by John Tucker. (Joint First Prize). Based on an original work by Bill Gold (1971). Photograph taken by Paul Capewell.

Biscuits in the shape of food poisoning bacteria, by Siobhan Webb, Anthony Clayton and Mark Worrall (Third prize)



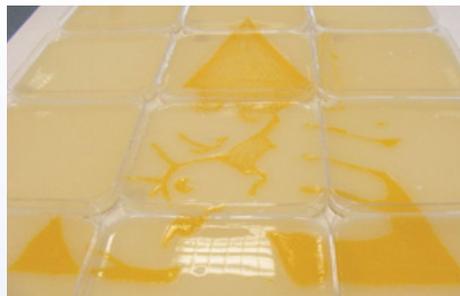
Graphic art images of motility



Jewellery inspired by the artist Mucha, by Emily Robertson (Joint First Prize)

For the past three years Yakult has sponsored an award at MMU. Recently I visited Professor Joanna Verran at the university and was delighted to have the opportunity to see some of the work associated with this.

Unlike most of the awards Yakult sponsors, this award is for a project concerning visual communication of science. Students studying microbiology in their first year can complete an assignment demonstrating links between microbiology and art. This popular option follows a lecture exploring this intriguing



combination, illustrated with many unusual and interesting examples. The project allows students to explore their creative side, and certainly seems to inspire spectacular and original pieces of coursework. Prizes are given to the top three pieces based on their scientific accuracy and creativity.

During my trip to Manchester I saw some wonderful pieces of art with amazing and intricate detail. One of my favourites used agar as a canvas and microbes as paint to reproduce the theatrical poster of Stanley Kubrick's 'A Clockwork Orange' (see below).

Examples of other work included pieces of fashion inspired by malaria (!), graphic art images of bacterial motility, and biscuits and cakes in the shapes of pathogens – which unfortunately (or fortunately?) had all been eaten by the time I arrived.

Our congratulations to the worthy winners – I am already looking forward to 2011 to see what next year's students come up with!

The European Congress of Psychiatry

Dr Rod Lambert
Lecturer at the
University of East Anglia



The European Congress of Psychiatry is an annual event organised by the European Psychiatric Association (EPA). Despite the European focus, it felt much more global in interest and relevance, with attendance of 3,200 delegates from over 80 countries.

I presented a poster on a randomised controlled trial that compared an occupational therapy-led lifestyle approach to routine GP care of panic disorder in primary care. The main focus of the poster however, was an explanatory model resulting from this work, which illustrated the occurrence of complex interactions that produce emergent mood and behaviour patterns. These can be adaptive – helping people to cope with everyday pressures, or maladaptive – leading to symptoms associated with mental health problems such as anxiety, depression and panic attacks.

Although this model was developed from my work on panic disorder, more recently I undertook a pilot study with a small cohort of 20 patients with irritable bowel syndrome (IBS). In this group of patients, 70% had experienced IBS for over five years.

The work (funded by Yakult) used a complex model to examine whether regular probiotic use (two bottles of Yakult per day for twelve weeks) could not only positively influence the symptoms of IBS, but also reduce levels of anxiety and depression – comorbid with IBS.

The preliminary results in this small cohort, showed that using a paired t-test for baseline and follow-up Beck Anxiety Inventory, mean scores reduced from 16.6 ($SD = 7.1$) to 9.63 ($SD = 9.14$; $P = 0.005$), and Beck Depression Inventory II mean scores reduced from 17.2 ($SD = 10.5$) to 10.9 ($SD = 11.3$; $P = 0.004$).

These results warrant further investigation; in summary the results indicate the following:

- The complex adaptive systems model I developed has a potentially broader application than panic disorder.
- Regular probiotic use with patients with IBS can potentially influence comorbid anxiety and depression.

Science team notice board

Diary Date: Yakult UK Symposium

The next Yakult UK Symposium will take place at 76 Portland Place in London on 12th October 2010.

Visit www.yakultsymposium.co.uk to view the programme and download a registration form. Generous discounts are available for NHS employees.

This is always a respected and popular event: spaces are filling up quickly—book soon and don't miss out!

Yakult
UK Symposium 2010

Food Allergy – The Widening Perspective

A joint meeting of Allergy Academy and Allergy Research Foundation

This meeting, on Wednesday 3rd November at 66 Portland Place, London, includes a talk by Prof Glenn Gibson on 'Probiotics – do they work? Some facts and myths'.

Visit www.allergyresearchfoundation.org/events for more details.



1st UK International Functional Food Conference

Organised by the Functional Food Centre at Oxford Brookes University, this conference takes place at the Barceló Oxford Hotel on 25th and 26th November.

Email functionalfoodconference@gmail.com for further information.

How can we support you?

- Free probiotic literature
- Free supply of Yakult for limited trial period
- Probiotic Bulletin newsletter
- Free educational talks by our team of nutritionists
- Advice on probiotics
- Dedicated website for healthcare professionals, www.yakult.co.uk/hcp

Pass it on

If you enjoy reading the Probiotic Bulletin and think your colleagues would also find it interesting, please forward it and encourage them to email science@yakult.co.uk to sign up.

Contact us

If you have any questions about probiotics, please do not hesitate to get in touch.

020 8842 7600

Science Department, Yakult UK Ltd
Artemis, Odyssey Business Park
West End Road, South Ruislip
Middlesex HA4 6QE

science@yakult.co.uk



Editor: Hannah Baker
Assistant Science Manager
Yakult UK Ltd