Editorial overview

Intestinal flora and human health- introductory remarks

Paul Nestel, MD, FRACP

Baker Medical Research Institute, Melbourne, Australia

This area of medical science began as a branch of microbiology- medical ecology, or the relationship between living beings and the microorganisms with which they coexist. That the colonic bacteria profoundly influence our health is a novel concept, intuitively grasped through food folklore long before medical scientists seriously tackled the question.

The discipline has made enormous progress in recent years and the health potential is being rapidly adopted by consumers and producers. As often happens in this era of mass communication, there is the danger that public expectation and the forces of the marketplace will exceed scientific consensus. This can harm an industry which in Australia is at a relatively early stage of product acceptance. It is therefore a credit to the industry for having sponsored this symposium. The program tackles the major issues and the scientific presentations contain new and exciting information, but couched carefully and conservatively. This is the only credible road to progress.

My role was to overview briefly the key issues which the speakers emphasised and these have been summarised in the following tables.

Table 1. Established and postulated functions of colonic microflora

Colonic microflora
Postulated functions
Metabolic, nutritive, immunologic, protective
Energy conservation
Carbohydrate, protein fermentation
Metabolic regulation
Bile acids, cholesterol, lignans, isoflavones
Colonocyte proliferation/ differentiation
Role of butyric acid
Protection
Bacteriostatic and bacteriocidal products
Barriers to pathogenic bacteria
Detoxification of carcinogens, etc
Immunocompetence
Clinical improvement of biomarkers
Experimental
Antimutagenic
Epidemiologic & experimental evidence

Table 2. Therapeutic potential of probiotic microorganisms

Therapeutic benefits
Diarrhoeal diseases
Infantile diarrhoea
Lactose maldigestion
Antibiotic related
Future advances
Improved Immunocompetence
Needs: Better biomarkers
Clinical trials
Preventing colonic neoplasia
Establish significance of:
SCFA especially butyrate
Detoxification of carcinogens
Regulation of colonocyte biology
Clinical trials
Healing gastric ulcers
H. pylori biology
Adjuvants to radiotherapy, etc

Table 3. Product research and development

Probiotics, prebiotics, symbiotics
Probiotic bacteria
Which bacteria?
Need evidence for:
Viability and survival
Capability to colonise colon
Therapeutic potential
Candidate bacteria
Lactobacilli (acidophilus, casei, gasseri, etc)
Bifidobacteria, Enterococci etc
Prebiotics
Non-digestible food ingredients that promote bacterial growth
Oligosaccharides
Symbiotics
Optimal combinations of prebiotics and probiotics
Technological challenges
Biological safety
Microbiological functionality
Substrate optimisation
Product acceptance
Responsible consumer information
Clinical challenges
Bioavailability
Clinical efficacy, safety

Correspondence address: Prof Paul Nestel, Baker Institute, Commercial Road, Prahran, VIC, Australia 3181
Tel: +61-3-9522-4302 Fax: +61-3-9521-1362