

# Healthy Science™ by Mannatech

## Gastrointestinal Research Is Becoming More than a Gut Feeling

Jane Ramberg

I have a gut feeling ...

... that many of us underestimate the important role our gastrointestinal tract plays in our overall health. If you have been following the literature, however, you will have noticed an explosion of scientific interest in this area—research made possible with the development of creative tools that can explore the inhospitable territory of our gut, our “inner tube of life.”<sup>1</sup> Much of this research has focused on the 1,000 trillion microorganisms (primarily bacteria) that live there. Dubbed the “dark matter of life” by the renowned scientist E.O. Wilson, these microorganisms outnumber the cells of our bodies 10:1 and, as a group, their genes outnumber ours 100:1.<sup>2</sup> They have been tough to study because they thrive in an environment that defies replication in the laboratory. So, scientists have resorted to genetic techniques to obtain their population “fingerprints.”

The emerging science is uncovering the exquisitely complex symbiotic (mutually beneficial) relationship that we share with these microorganisms.<sup>1,3</sup> The benefit for them, of course, is a nice, warm, safe place to live! And what do we gain? We’re learning that these gut bacteria do a lot more than their long-acknowledged tasks of breaking down complex molecules that human enzymes can’t digest and producing biotin and vitamin K. Their functions are much more sophisticated: producing hormones that direct fat storage; regulating intestinal physiology, development and function; “training” the immune system, and preventing the growth of harmful, pathogenic bacteria. We’ve also learned that gut microbial ecosystems can be perturbed by antibiotics,<sup>4</sup> associated with changes in body weight<sup>5</sup> and correlated with blood glucose levels.<sup>6</sup>

### Increase in Probiotic Research

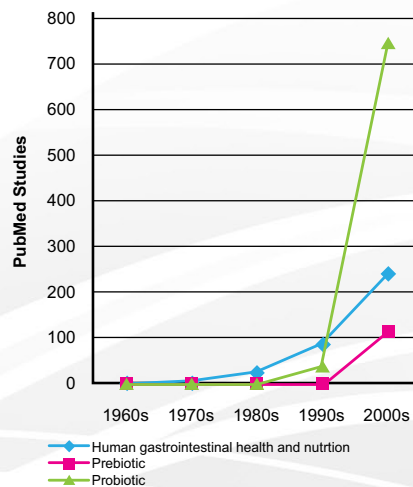
Nutrition researchers have been paying attention, investigating a means to modulate GI tract function and support health. Probiotic research has recently become a hot topic, as can be seen in this chart showing an overview of studies published over the past five decades.

Mannatech has been in the forefront of developing supplements that support GI tract health. Ambrotose® complex, launched in 1996, was a prebiotic supplement ahead of its time.\* Both Ambrotose complex and Advanced Ambrotose® powder have been shown, in *in vitro* studies using human colonic bacteria, to exert positive prebiotic effects.\*<sup>7,8</sup> GI-ProBalance™ slimsticks were formulated to work together to enhance the effectiveness of Ambrotose products.\*

Probiotics are bacteria, taken orally, that are designed to colonize and support the health of the GI tract.  
Prebiotics are oligosaccharides and polysaccharides that support the growth of healthy bacteria in the GI tract.

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4. Dethlefsen L, Huse S, Sogin ML, Relman DA. The pervasive effects of an antibiotic on the human gut microbiota, as revealed by deep 16S rRNA sequencing. *PLoS Biol* 2008;6:e280.
5. Turnbaugh PJ, Hamady M, Yatsunenko T, et al. A core gut microbiome in obese and lean twins. *Nature* 2008.
6. Larsen N, Vogensen FK, van den Berg FW, et al. Gut Microbiota in Human Adults with Type 2 Diabetes Differs from Non-Diabetic Adults. *PLoS ONE* 2010;5:e9085.
7. Sinnott RA, Ramberg J, Kirchner JM, et al. Utilization of arabinogalactan, aloe vera gel polysaccharides, and a mixed saccharide dietary supplement by human colonic bacteria in vitro. *Int J Probiotics Prebiotics* 2007;2:97–104.
8. Marzorati M, Verhelst A, Luta G, et al. *In vitro* modulation of the human gastrointestinal microbial community by plant-derived polysaccharide-rich dietary supplements. *Int J Food Microbiol* 2010;139:168–76.

### HUMAN GI TRACT HEALTH AND NUTRITION STUDIES



Jane Ramberg is Director of Product Science at Mannatech

\* This statement has not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.