

Brain Maker: The Power of Gut Microbes to Heal and Protect Your Brain—for Life. By David Perlmutter. Boston: Little, Brown and Company; 2015, US \$16.36 (Hardcover). 320 p. ISBN: 978-0316380102

A book should be assessed as a failure or success depending on whether it achieves its own goals, which is the key insight that must be kept constantly in mind when evaluating David Perlmutter's new work *Brain Maker: The Power of Gut Microbes to Heal and Protect Your Brain – For Life*.

Perlmutter's basic argument is that the human microbiome – the universe of especially bacterial organisms that live symbiotically inside of all humans – is housed primarily in the gut, and should be properly considered an “organ system” all to itself. All told, it contains nearly ten times the number of cells as the rest of the human body, weighs as much as the brain, elaborates neurotransmitters, synthesizes vitamins, and regulates nutrient and toxin access to the blood stream. Moreover, its “health” – that is, the diversity and type of species constituting the microbiome – is determined by human actions (especially our diet and intake of antibiotics). An unhealthy or deranged microbiome has been implicated in a surprising array of neurological diseases including autism, Tourette syndrome, Multiple Sclerosis, Alzheimer's, and amyotrophic lateral sclerosis. The upshot is that it may be possible to prevent or treat many neurological diseases by nourishing our gut microbes.

At the very least, Perlmutter's thesis is both interesting and surprising, since it so completely defies the conventional theories of disease pathogenesis. It is also not totally implausible, as the book is replete with scientific studies stacking evidence in support of Perlmutter's claims.

But in writing *Brain Maker*, Perlmutter aims to be more than explanatory. His intention is to be sensational; to shock to astound his audience, to captivate and enthrall them. He recounts stories of children treated for autism by home, microbe-laced enemas; adults liberated from Multiple Sclerosis by fecal transplants. To be fair, Perlmutter stops short of branding these therapies as outright “cures,” but he comes close on a number of occasions. The effect of this almost unrestrained enthusiasm is to charge the book with energy and excitement, but simultaneously undermines its scientific credibility. Nevertheless, Perlmutter's book probably succeeds in its primary objective: to introduce a new, strange idea into the general consciousness, and to generate maximal emotional appeal. This is not a work of original scholarly research, nor is it an objective review of the totality of evidence concerning the microbiome, but it is an intriguing intro-

duction to a subject that has been unduly neglected, even by many physicians.

Jack S. Parker, MD
Department of Ophthalmology
UAB Callahan Eye Hospital

Welcome to the Microbiome: Getting to Know the Trillions of Bacteria and Other Microbes In, On, and Around You. By Rob DeSalle and Susan L. Perkins, Illustrated by Patricia J. Wynne. New Haven, CT: Yale University Press; 2015, US \$23.58 (Hardcover). 264 p. ISBN: 978-0300208405

Welcome to the Microbiome is a small book with a huge scope. Starting from the definition of life itself, authors DeSalle and Perkins move through molecular biology and genetic phylogeny all the way up to the integration of human and microbial systems in everything from diabetes to depression. The result is an incredibly comprehensive survey of a dynamic field that has only recently begun to take root in our everyday lives. The intended audience of the book also runs the gamut; inclusion of basic information about transcription and translation make the more nuanced details about phylogeny and phylotypes relatively accessible to the average reader, and perhaps even the active researcher in the field may learn something about the morphology of belly buttons.

While the book caters to everyone in theory, those unfamiliar with molecular biology and genetics may find themselves a little perplexed in the earlier chapters, which attempt to explain the scientific principles that underlie microbiome research. Curiously enough, chapter one begins with subatomic particles, then moves into the atomic scale for a sentence or two before launching into the human predilection for binary classification – that is, “yes” or “no” categories. From there, the chapter takes a molecular turn to introduce the AGCT/U of nucleotides, and the entire amino acid alphabet within two paragraphs. Later explanations of the innate and adaptive immune system are likewise nonlinear and abbreviated. Such a whirlwind tour might be a little much to track, even for the science literate.

Welcome to the Microbiome really shines, however, when it segues into the human body as a series of ecological niches, and how individual microbial signatures manifests in human ecology — the microbial fingerprints of our homes, workplaces, and cities. All of this culminates in a discussion of how geography, genetics, interpersonal interaction and diet influence the microbiome, and how science is beginning to understand the cumulative impact of microbiome on health. DeSalle and Perkins do a spectacular job of building the case for the