The Enterococci

Pathogenesis, Molecular Biology, and Antibiotic Resistance
The Enterococci
Pathogenesis, Molecular Biology, and Antibiotic Resistance

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Preface

The introduction of antibiotics represents, by many measures, the most important advance in modern medicine. Seemingly overnight, leading causes of death became treatable, and the average lifespan was dramatically extended. The inevitable consequence of what for millions, if not billions, was a life-saving miracle, was the rise to prominence of organisms that are unfazed by antibiotics because of either intrinsic ruggedness or the result of having acquired resistance traits. Enterococci have emerged among the vanguard of these bacteria both because they are intrinsically unaffected by many antibiotics and because they have acquired resistance genes to counter the antibiotics that once were effective. Beginning in the mid 1980s, enterococcal infections started cropping up that were untreatable with antibiotics; these infections now occur around the world, particularly in the United States, and the rate is increasing essentially unabated.

Those directly involved in health care quickly became aware of and alarmed by the emergence of “pan-resistant” enterococci. However, for a number of reasons relating to economics, bureaucratic inertia, and competing needs with higher-profile constituencies, an infrastructure to effectively combat the emergence of highly resistant bacteria did not exist. Arguably, this infrastructure is still far from being in place.

With the first signs of this emerging health care crisis arising in the late 1970s and early 1980s, a small coterie of dedicated and very persistent investigators began to coalesce around the few pioneers probing enterococcal disease, molecular biology, and antibiotic resistance. This group included the co-editors and many of the chapter authors for this volume, as well as a few who came before. As the percentage of variably resistant enterococci continued to climb, the gap between the magnitude of the problem and effective action spread, despite the best efforts of those engaged (and these efforts were impressively insightful and creative, with such discoveries as conjugal transposons, pheromone signaling among bacteria, and descriptions of entirely novel antibiotic resistance mechanisms). In late 1998 it became clear that enterococcal research was reaching either a break point or an inflection point. “Hypothesis driven” became the mantra of public research funding agencies, locking in the status quo and effectively thwarting the development of new research fields that lacked data on which a competitive hypothesis could be advanced.
This growing disparity spawned the 1st International ASM Conference on Enterococci, which was held in Banff, Canada, February 27–March 2, 2000. Thanks in large part to the organizational assistance provided by the American Society for Microbiology, and the robust support from the private sector, which survives by its ability to rapidly recognize and respond to an emerging problem, the conference was by all measures a success. During the course of the proceedings, it became clear that a key tool for recruitment of new investigators to the fray would be a comprehensive primary text on enterococci—not just the proceedings of the meeting—covering pathogenesis of infection, molecular biology, and antibiotic resistance. It was felt that such a resource would be of great value to those dealing daily with consequences of antibiotic-resistant infection, those actively engaged in enterococcal research, and those searching for a scientific basis for public policy decisions.

It has been immensely rewarding to see this idea grow from concept to press in exactly 2 years, and there are many to thank for their support and attention to detail. First I would like to thank my co-editors, who have done much to set the very positive and collaborative tone for enterococcal research. Second, I would like to thank the authors for their creative synthesis of uniformly authoritative chapters—and for commendably adhering to schedule. On that note I would also like to thank Greg Payne of ASM Press for being gentle but persistent in guiding this project to fruition. None of this would have happened without the support and assistance that staging the Banff meeting required, and although those contributors are too many to acknowledge here, there are several who rose above and beyond the call, including Don Clewell and David Shlaes, who served admirably as co-organizers of the Banff meeting (I still remember Don’s telephone call just days before the meeting asking whether I had ever stopped to consider the February temperature in Banff). Joe Ferretti, Jim Hoch, Yasu Ike, Molly Schmid, Lisa Nalker, Gail Cassell, Bob Cochran, Dan Sahm, and Julian Davies all made key contributions at particularly critical points in the process that were absolutely essential for the success of the meeting, and ultimately the production of this volume. Neither the book nor the meeting would have been possible without the energetic and enthusiastic support of the “Lab Guys”: Lynn Hancock, Brett Shepard, Phil Coburn, Wolfgang Haas, Michael Engelbert, Ken Hatter, Chris Cox, Keeta Gilmore, Midge Carey, Chris Pillar, Debbie Griggs, and associates Nathan Shankar, Arto Baghdayan, and Mark Huycke, who were unflinchingly loyal whenever pressed into service. With the next generation of enterococcal investigators of this caliber, I have great confidence in our ability to address the enterococcal problem. Finally, these undertakings invariably encroach into one’s personal life, and I gratefully acknowledge the love and support of my entire family, and especially my wife Keeta and my daughter Stephanie, who agonized with me over many of the details and uncertainties, who often had to cope with my absence, and who were also pressed into service on many occasions.

My hope is that this text will foster the transition from the path that follows the problem, to the one that leads to success.

Michael S. Gilmore
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