Why a ‘Systems Approach to Microbiology’ Might Not Be the Best Approach
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As a teaching professor for undergraduate and graduate science and health science majors at a small, but rapidly growing, private university, some of my more entertaining and challenging students are freshman nursing students. These second semester freshmen must get a ‘C’ in my medical microbiology course to continue in the nursing program. This added stress, while motivating to a degree, makes the subject seem overwhelming to a good number of students, especially those still adapting to college life. Therefore, a textbook that is readable and engaging is an absolute must. I have used Microbiology: A Systems Approach, originally by Marjorie Kelly Cowan and Kathleen Park Talaro, for many years now, beginning with the first edition. However, I am currently considering a change, for reasons I’ll explain here.

The third edition of Microbiology: A Systems Approach has two obvious differences. First, it lacks Cowan’s original collaborator, Kathleen Talaro, a noted science illustrator. However, she gained a collaborator, Jennifer Herzog, who has contributed many new digital learning tools. These tools include computerized testing, flashcards, a few virtual labs and McGraw-Hill’s LearnSmart, most of which (I am embarrassed to admit) I have not used. Instead, I have found the textbook’s images, case studies, and concept mapping tools, provided at the end of each chapter, to be very useful and easily adaptable to group learning during lecture or laboratory sessions. The second obvious difference is just 26 fewer pages of text, judiciously removed from multiple chapters. More subtle changes involve updating many of the figures, particularly in the immunology chapters, which pleased me, and more current, real-world or insight readings. Otherwise, it is my opinion the third edition, not surprisingly, is very similar to the second.

I like this textbook because I believe it is written in a manner appropriate to the level of freshman college students but also challenges them to expand their vocabulary in microbiology and beyond. I like the case studies and give extra credit to those students who visit the CDC and WHO websites to find the actual case reports or their summaries and investigate more about the microbes involved. I also like the early introductions to eukaryotic microbes and viruses. I believe it helps the students stay focused on why they are learning about microbial biology. Finally, I originally chose this textbook because the pathogenic microorganisms were introduced and described based on the organ systems they infect. What could be more logical for nursing students who will
need to respond to their patients’ infections in a practical way? However, therein lies my problem with the text.

When my students take medical microbiology, they have not completed the second semester of anatomy and physiology, which focuses on the composition and function of internal organ systems, including the immune system, and have not had any exposure to the pathophysiology (or cellular basis) of disease. As such, learning the litany of different microbes that infect a particular organ system becomes a game of memorizing Latin names. However, when I present a series of short PowerPoint lectures that focus on a taxonomic family of pathogens, the students are able to correlate the pathogen with its microbial biology. So, although a systems approach seems like a logical method for learning human pathogens, it does not work well with my student population. Therefore, while I consider Dr. Cowan’s third edition of Microbiology: A Systems Approach, to be a well-written, updated text with many new digital learning tools, I suggest you consider the background of your students before adopting this approach to teaching medical microbiology.

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