

**Developing Novel Antimicrobial Agents: Is There Any Hope?**

Karen Bush

Indiana University, USA

Although the number of large pharmaceutical companies engaged in antibiotic research has diminished, the biotech industry has maintained an active presence in this area. As a result, novel antimicrobial agents remain in the pharmaceutical pipeline. Many of these are improvements of known antibiotic classes, resulting in more potent activity against resistant bacteria. Examples include the aminoglycoside plazomicin, the macrolides cethromycin and solithromycin, the oxazolidinones tedizolid phosphate and radezolid, assorted quinolones including delafloxacin, nemonoxacin, zabofloxacin, and JNJ-Q2, and various β -lactams. The anti-pseudomonal cephalosporin ceftolozane, which has been combined with tazobactam, is currently in late stage clinical trials. Novel non- β -lactam β -lactamase inhibitors currently in development include avibactam, MK-7655 and RPX7009, combined with known cephalosporins or carbapenems. The siderophore monosulfactam BAL30072 has a novel mechanism of action that serves as a representative monocyclic beta-lactam with stability to metallo-beta-lactamases and increased uptake into the bacterial cell. Less clinical success has been observed with agents that target nonclassical antibiotic targets. However, there is optimism for compounds such as the peptide deformylase inhibitor GSK1322322, the novel synthetic mimic of host defense proteins PMX-30063, and the fatty acid synthesis inhibitor AFN-1252, all of which have completed at least one Phase 2 clinical trial. Although the drug approval process is not straightforward, the current antimicrobial pipeline offers the hope that useful antimicrobial drugs will emerge from at least some of these novel development candidates.