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All organisms must acquire carbon from their environment for the generation of energy and the production of macromolecules such as proteins and lipids. Archaea use several different carbon fixation mechanisms, depending on the environment in which they are found. On [page 447](#) Georg Fuchs and colleagues discuss the three carbon fixation mechanisms that have been discovered in archaea so far and explain how elucidating these pathways can enhance our understanding of ancestral autotrophic carbon fixation mechanisms.

Similarly to archaea, intracellular bacterial pathogens must adapt to their environment (in this case the host cell) to acquire carbon for metabolic processes. On [page 401](#), Werner Goebel and colleagues discuss how technological advances have furthered our understanding of the carbon metabolism of intracellular bacterial pathogens that replicate in the host cytosol or in vacuoles, including *Shigella flexneri* and *Listeria monocytogenes*. These pathogen-specific metabolic adaptations may be required for the optimal expression of virulence genes, and further research into this area could provide us with new targets for antimicrobial therapy.

Indeed, the development of new antimicrobials is sorely needed owing to the increase in prevalence of drug-resistant bacteria. Most antimicrobials currently in use inhibit DNA, RNA and cell wall or protein synthesis. Although the mechanisms by which the drugs interact with their targets are known, the complex bacterial responses that lead to cell death are not as well understood. On [page 423](#) Michael Kohanski, Daniel Dwyer and James Collins review our current knowledge of drug–target interactions and the bacterial responses that ensue and discuss new insights into these processes, obtained from the study of biological networks, that could facilitate the development of new treatments.

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