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Growth is a carefully orchestrated process in all organisms, involving many tightly regulated proteins, but it can also be affected by physical phenomena. For instance, in the case of fungi that form hyphae, the internal pressure (turgor) in the hyphal tip contributes to hyphal growth, as described by Lew on page 509; furthermore, turgor causes the mass flow of cytoplasm from the basal mycelial network towards the expanding hyphal tips. Interestingly, the processes that are involved in growth and homeostasis of eukaryotic cells can be targets for bacterial toxins. On page 487, Aktories describes how bacterial toxins modify host regulatory GTPases through ADP-ribosylation, glucosylation, adenylylation, proteolysis, deamidation and transglutamination. This affects the activities of these regulatory proteins and leads to changes in processes such as membrane transport, cytoskeleton maintenance and the formation of immune synapses. Studies of the mechanisms of action for these toxins have provided insight not only into the pathogens but also into the details of the affected host processes. Similarly, as described by Martin-Serrano and Neil on page 519, the study of retroviral release and the role of proteins from the endosomal sorting complex required for transport (ESCRT) machinery has revealed interesting aspects of host cell trafficking pathways and, furthermore, identified the host plasma membrane as an important barrier to retroviral release. Finally, Sohm, Webb and Capone describe on page 499 how new research has provided fresh insight into patterns of marine nitrogen fixation. In particular, they focus on the roles of phosphorus, iron, temperature, fixed nitrogen and physical forces in the distribution of nitrogen fixation by bacteria in marine environments.



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Printed in Wales by Cambrian Printers
on acid-free paper