

# nature

## REVIEWS

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# MICROBIOLOGY

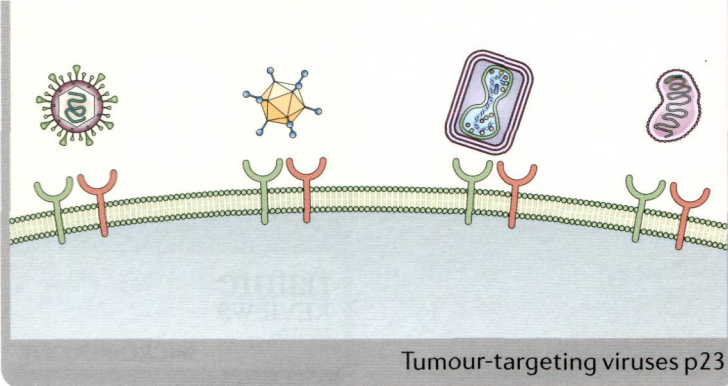


### SINGLE-MOLECULE STUDIES

Opening a window into the bacterial cell

### Targeting translation

Structural and mechanistic studies of ribosomal antibiotics



## REVIEWS

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### Exploring bacterial cell biology with single-molecule tracking and super-resolution imaging

*Andreas Gahlmann and W. E. Moerner*

Here, Gahlmann and Moerner describe single-molecule imaging in live bacterial cells, which has transformed the study of bacterial cell biology. They discuss the insights that have been gained about the bacterial cytoskeleton, nucleoid organization and chromosome segregation and partitioning, as well as transcription and translation.

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### New viruses for cancer therapy: meeting clinical needs

*Tanner S. Miest and Roberto Cattaneo*

Oncolytic viruses can infect and destroy tumour tissues; however, many have proven less effective in clinical trials than anticipated. Miest and Cattaneo outline strategies to enhance the efficacy of next-generation virotherapy and to provide the clinic with a range of viruses that are engineered to safely and specifically destroy cancer cells.

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FEATURED  
ARTICLE

### Ribosome-targeting antibiotics and mechanisms of bacterial resistance

*Daniel N. Wilson*

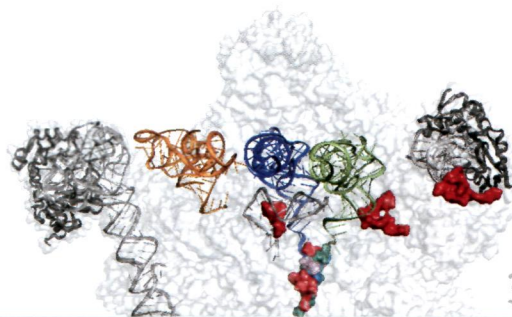
The ribosome is one of the primary antibiotic targets in the bacterial cell. Here, Daniel Wilson discusses how high-resolution crystal structures of antibiotic-ribosome complexes have provided molecular insight into the mechanisms of antibiotic action and bacterial resistance, in addition to the approaches being pursued for the development of improved and novel ribosome-targeting antibiotics.

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### Adhesion, invasion and evasion: the many functions of the surface proteins of *Staphylococcus aureus*

*Timothy J. Foster, Joan A. Geoghegan, Vannakambadi K. Ganesh and Magnus Höök*

*Staphylococcus aureus* is an important human pathogen that can cause invasive, potentially fatal infections. *S. aureus* expresses several virulence factors, which include cell wall-anchored surface proteins. Here, Foster and colleagues review the structural characteristics and functions of these proteins and how this knowledge can be used to combat *S. aureus* infection.



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**SINGLE-MOLECULE STUDIES**  
Opening a window into the host-trait cell

**Targeting translation**  
Structural and mechanistic studies of ribosomal antibiotics

► **COVER:** 'Window into the cell' by Philip Patenall, inspired by the Review on p9.

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## NEWS & ANALYSIS

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## PERSPECTIVES

### OPINION

- 63 **Bacterial programmed cell death: making sense of a paradox**

*Kenneth W. Bayles*

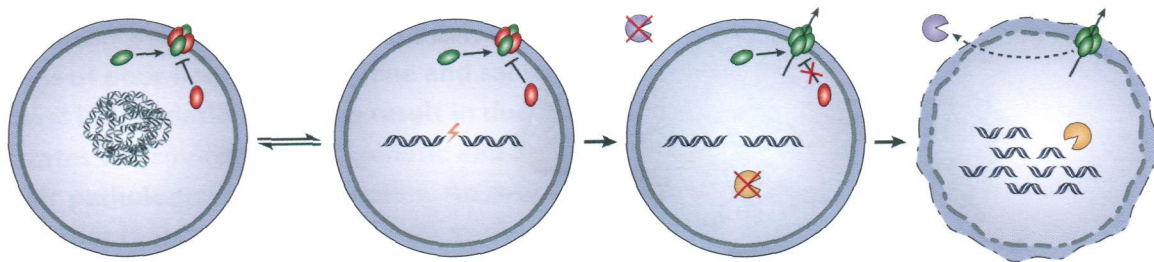
In this Opinion article, Kenneth Bayles describes our current knowledge of programmed cell death in bacteria and argues that the processes involved are functionally analogous to eukaryotic systems. On the basis of recent observations, a testable model to guide further investigations in the field is presented.

- 70 **Antimalarial drug discovery — approaches and progress towards new medicines (erratum)**

*Erika L. Flannery, Arnab K. Chatterjee and Elizabeth A. Winzeler*

- 70 **Structural insights into the coupling of virion assembly and rotavirus replication (erratum)**

*Shane D. Trask, Sarah M. McDonald and John T. Patton*



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