nature REVIEWS

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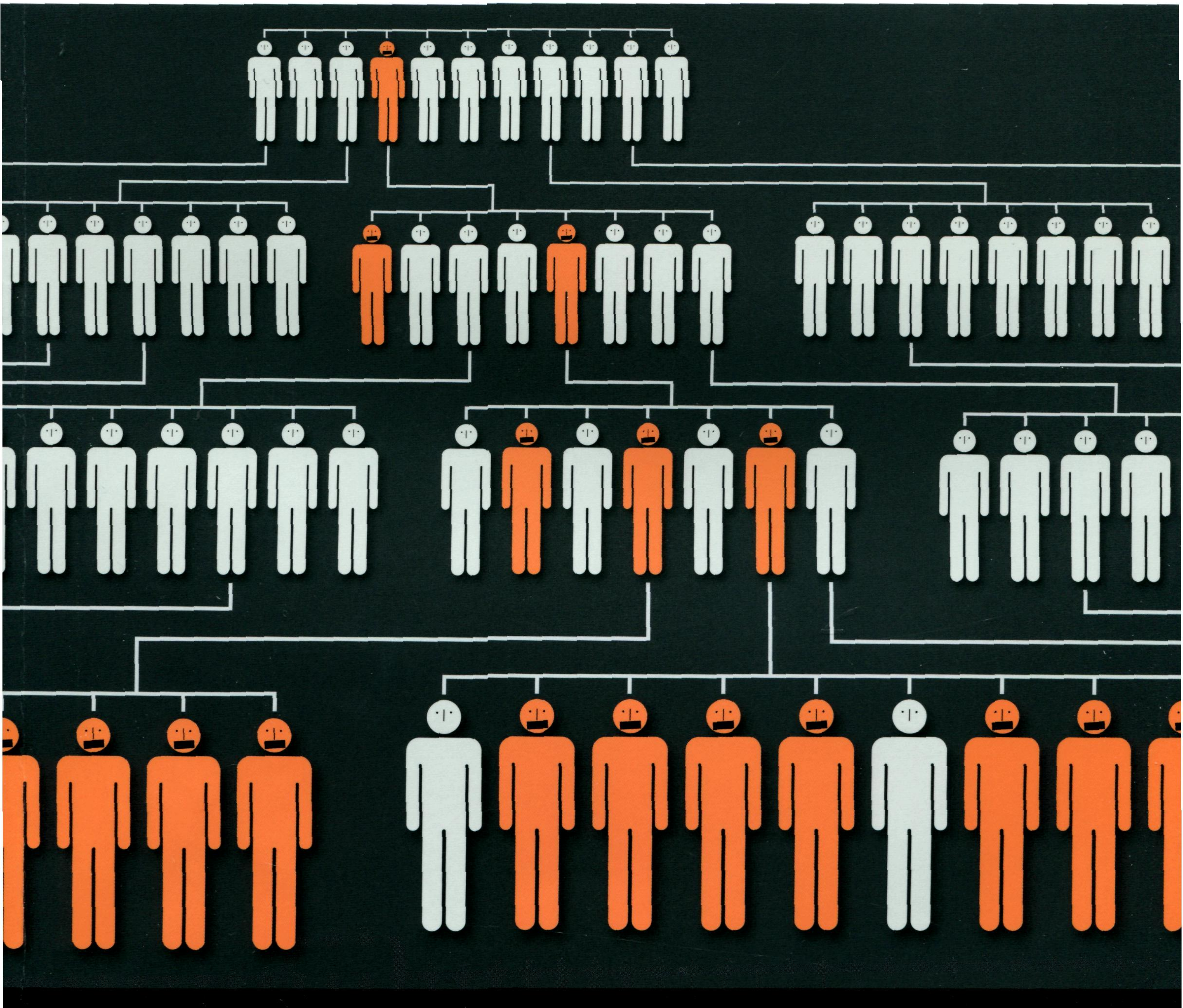
MICROBIOLOGY

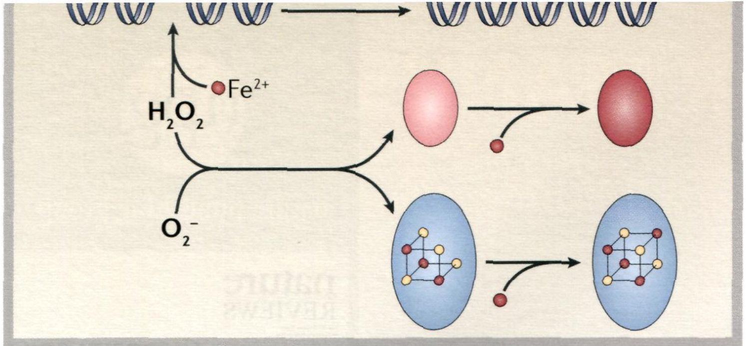


BEATING THE SILENT EPIDEMIC

Advanced antiviral therapy for HCV

Do the maths

Fulfilling the promise of systems virology



Oxidative damage and defence p443

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443 **The molecular mechanisms and physiological consequences of oxidative stress: lessons from a model bacterium**

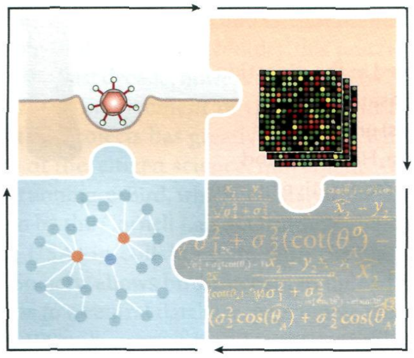
James A. Imlay

To survive in oxic environments, all organisms require mechanisms to degrade toxic reactive oxygen species (ROS). In this Review, James Imlay describes the oxidative stress response of *Escherichia coli* and considers the damage caused by ROS and the adaptive strategies used by this bacterium to minimize intracellular ROS accumulation.

455 **Systems virology: host-directed approaches to viral pathogenesis and drug targeting**

G. Lynn Law, Marcus J. Korth, Arndt G. Benecke and Michael G. Katze

Katze and colleagues provide an overview of the evolution of systems virology and the insights obtained from using such methodologies to study virus–host interactions. Combining systems, mathematical and computational approaches with traditional virology research will offer a better understanding of how viruses cause disease and will help in the development of therapeutics.



467 **Fortifying the barrier: the impact of lipid A remodelling on bacterial pathogenesis**

Brittany D. Needham and M. Stephen Trent

Lipid A is the bioactive component of the Gram-negative outer membrane and is extensively remodelled to enable the bacterium to subvert the immune system of the host. Here, Needham and Trent describe the regulation of lipid A-modifying enzymes, the host defences that target lipid A and the strategies that bacterial pathogens use to avoid immune detection.

482 FEATURED ARTICLE **The molecular and structural basis of advanced antiviral therapy for hepatitis C virus infection**

Ralf Bartenschlager, Volker Lohmann and Francois Penin

Hepatitis C virus infection is a major cause of liver cirrhosis and cancer, and current therapies are often ineffective or have severe side effects. Here, Bartenschlager and colleagues review how structural and functional insights into the viral life cycle have allowed the development of novel direct-acting antiviral agents.

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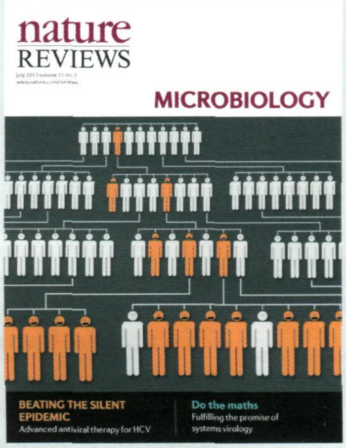

► **COVER:** 'Silent epidemic' by Philip Patenall, inspired by the Review on p482.


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