

174
F37

u75u

FEMS

THEMATIC ISSUE

MICROBIOLOGY REVIEWS

**Molecular Insights into Environmental
Microbes**

Volume 37

Issue 3

May 2013

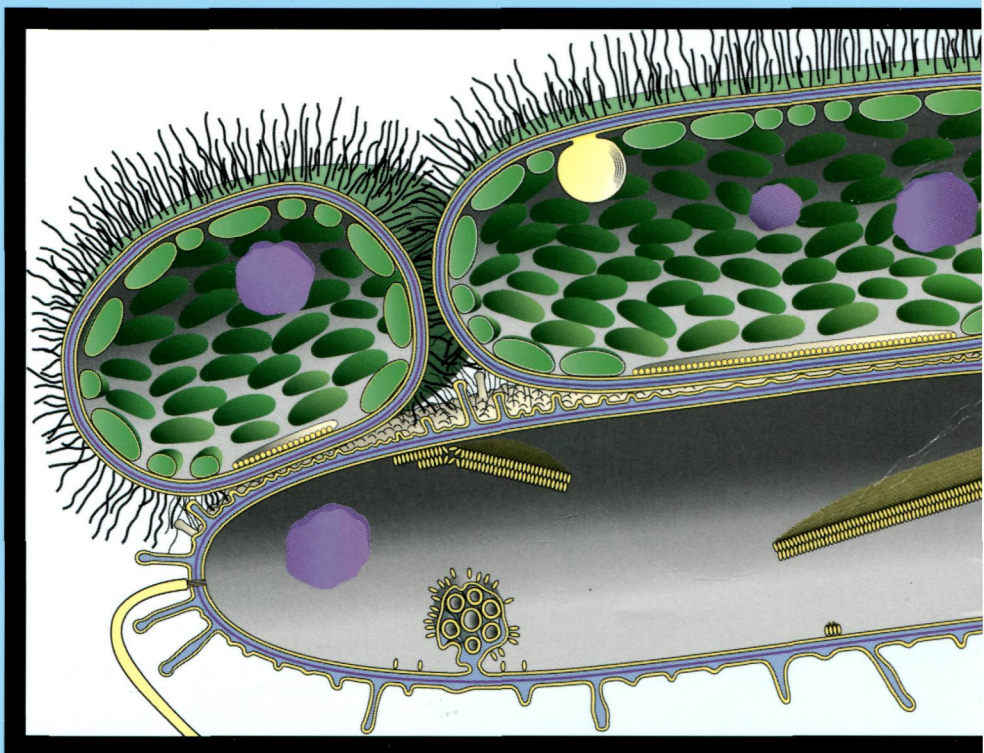
ISSN 0168-6445

Issue Editors

Hauke Hennecke

Staffan Kjelleberg

Corina Brussaard



WILEY
Blackwell



Discover this journal online at
WILEY ONLINE LIBRARY
onlinelibrary.com/journal/femsre

FEMS Microbiology Reviews

Special Issue: Molecular Insights into Environmental Microbes

May 2013

Volume 37, Issue 3

Pages 285–476

• *Editorial*

Molecular insights into environmental microbes (page 285)

Hauke Hennecke, Staffan Kjelleberg and Corina Brussaard

• *Review Articles*

Trichodesmium – a widespread marine cyanobacterium with unusual nitrogen fixation properties (pages 286–302)

Birgitta Bergman, Gustaf Sandh, Senjie Lin, John Larsson and Edward J. Carpenter

Article first published online: 20 SEP 2012 | DOI: 10.1111/j.1574-6976.2012.00352.x

The substantial progress related to processes and mechanisms involved in the diazotrophic biology of the cyanobacterium *Trichodesmium* is reviewed.

Key microbial drivers in Antarctic aquatic environments (pages 303–335)

David Wilkins, Sheree Yau, Timothy J. Williams, Michelle A. Allen, Mark V. Brown, Matthew Z. DeMaere, Federico M. Lauro and Ricardo Cavicchioli

Article first published online: 20 NOV 2012 | DOI: 10.1111/1574-6976.12007

Antarctica is arguably the world's most important continent for influencing the Earth's climate and ocean ecosystem function, and this review puts into perspective the insight that has been and can be gained about Antarctica's aquatic microbiota by using molecular biology, and in particular, metagenomic approaches, by revealing deep insight into which

microorganisms are present in cold environments, and what biogeochemical processes they perform.

Cues and regulatory pathways involved in natural competence and transformation in pathogenic and environmental Gram-negative bacteria (pages 336–363)

Patrick Seitz and Melanie Blokesch

Article first published online: 20 SEP 2012 | DOI: 10.1111/j.1574-6976.2012.00353.x

In this review, we summarize recent data on cues and regulatory circuits driving natural competence and transformation in representative Gram-negative bacteria.

Molecular insights into bacteroid development during *Rhizobium*–legume symbiosis (pages 364–383)

Andreas F. Haag, Markus F. F. Arnold, Kamila K. Myka, Bernhard Kerscher, Sergio Dall'Angelo, Matteo Zanda, Peter Mergaert and Gail P. Ferguson

Article first published online: 2 APR 2013 | DOI: 10.1111/1574-6976.12003

Rhizobia differentiate from free-living soil bacteria to nitrogen fixing endosymbionts of legume plants requiring specific adaptations for chronic maintenance.

Microbial syntrophy: interaction for the common good (pages 384–406)

Brandon E.L. Morris, Ruth Henneberger, Harald Huber and Christine Moissl-Eichinger

Article first published online: 8 APR 2013 | DOI: 10.1111/1574-6976.12019

Many microbial communities are based on syntrophy; this obligately mutualistic, interactive exchange of metabolic products allows them to perform ecologically important, low-energy yielding but survival-ensuring chemical conversions in extreme natural and man-made niches.

The future is now: single-cell genomics of bacteria and archaea (pages 407–427)

Paul C. Blainey

Article first published online: 11 FEB 2013 | DOI: 10.1111/1574-6976.12015

New cultivation-independent technologies for single-cell genome sequencing are driving environmental microbial genomics farther across the tree of life and deeper into populations of bacteria and archaea.

How to make a living from anaerobic ammonium oxidation (pages 428–461)

Boran Kartal, Naomi M. de Almeida, Wouter J. Maalcke, Huub J.M. Op den Camp, Mike S.M. Jetten and Jan T. Keltjens

Anaerobic ammonium-oxidizing (anammox) bacteria make their living from the conversion of ammonium and nitrite into dinitrogen gas using a new route. Here, current concepts on this new route are reviewed and its connection with energy (ATP) conservation and biomass formation is discussed.

The seaweed holobiont: understanding seaweed–bacteria interactions (pages 462–476)

Suhelen Egan, Tilmann Harder, Catherine Burke, Peter Steinberg, Staffan Kjelleberg and Torsten Thomas

This review discusses the diversity and ecology of seaweed (macroalgae)-associated bacteria with an emphasis on the factors that influence epiphytic community composition and function.