

## Special Issue

# Bacterial Cell Biology and Development: Ionic Homeostasis, Nutritional Immunity, and Pathogenesis

### Message from the Guest Editor

Bacterial cell biology and development are tightly coupled to ionic homeostasis and host–pathogen interactions. During infection, the host restricts access to essential metals (nutritional immunity), imposing selective pressures that reshape bacterial growth, morphology, and regulatory programs. Bacteria counter with specialized transport and sensing systems for key ions (e.g.,  $Mg^{2+}$ , Fe, Zn, Mn) that maintain homeostasis and, in a species- and context-dependent manner, modulate membrane remodeling, secretion system activity, biofilm formation, and virulence regulation. Recent work highlights magnesium transporters and the PhoP–PhoQ network as central nodes interfacing with other metal transport systems to contribute to developmental transitions and persistence, with implications for antibiotic tolerance and therapeutic targeting. This Special Issue invites original research and reviews spanning molecular mechanisms, structural and imaging analyses (including cryo-EM/ET), physiology and genetics, and host–pathogen crosstalk. We aim to clarify how ionic fluxes and their regulation shape bacterial cell biology and development across species and disease contexts.

### Guest Editor

Dr. Jeong Min Chung

Department of Biotechnology, The Catholic University of Korea,  
Bucheon-si 14662, Republic of Korea

### Deadline for manuscript submissions

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*Microorganisms*  
Editorial Office  
MDPI, Grosspeteranlage 5  
4052 Basel, Switzerland  
Tel: +41 61 683 77 34  
[microorganisms@mdpi.com](mailto:microorganisms@mdpi.com)

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### Message from the Editor-in-Chief

"Microorganism" merges the idea of the very small with the idea of the evolving reproducing organism is a unifying principle for the discipline of microbiology. Our journal recognizes the broadly diverse yet connected nature of microorganisms and provides an advanced publishing forum for original articles from scientists involved in high-quality basic and applied research on any prokaryotic or eukaryotic microorganism, and for research on the ecology, genomics and evolution of microbial communities as well as that exploring cultured microorganisms in the laboratory.

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### Editor-in-Chief

Dr. Nico Jehmlich

Department of Molecular Systems Biology, UFZ-Helmholtz Centre for Environmental Research, 04318 Leipzig, Germany

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