
Contents

Part I

Molecular Physiology of Metal-Microbe Interactions According to Mechanisms

Understanding How Cells Allocate Metals

S. Tottey · D. R. Harvie · N. J. Robinson 3

Metalloregulators: Arbiters of Metal Sufficiency

J. D. Helmann · S. Soonsanga · S. Gabriel 37

Transcriptomic Responses of Bacterial Cells

to Sublethal Metal Ion Stress

J. L. Hobman · K. Yamamoto · T. Oshima 73

Bacterial Transition Metal Homeostasis

D. H. Nies 117

Biosensing of Heavy Metals

H. Harms 143

A Glossary of Microanalytical Tools to Assess the Metallome

D. Wesenberg · C. Bleuel · G.-J. Krauss 159

Part II

Molecular Physiology of Metal-Microbe Interactions According to Groups

Acquisition of Iron by Bacteria

V. Braun · K. Hantke 189

New Transport Deals for Old Iron

G. Grass 221

Manganese: Uptake, Biological Function, and Role in Virulence

K. M. Papp-Wallace · A. S. Moomaw · M. E. Maguire 235

How Bacteria Handle Copper

D. Magnani · M. Solioz 259

Microbial Physiology of Nickel and Cobalt

R. P. Hausinger · D. B. Zamble 287

Zinc, Cadmium, and Lead Resistance and Homeostasis

C. Rensing · B. Mitra 321

Microbiology of the Toxic Noble Metal Silver

S. Franke 343

**Mercury Microbiology:
Resistance Systems, Environmental Aspects,
Methylation, and Human Health**

S. Silver · J. L. Hobman 357

Arsenic Metabolism in Prokaryotic and Eukaryotic Microbes

H. Bhattacharjee · B. P. Rosen 371

Reduction and Efflux of Chromate by Bacteria

C. Cervantes · J.ú. Campos-García 407

Molybdate and Tungstate:**Uptake, Homeostasis, Cofactors, and Enzymes**

G. Schwarz · P.-L. Hagedoorn · K. Fischer 421

Subject Index 453