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Autore	Tonelli Fernanda Maria Policarpo
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nanoparticles for nanoremediation -- Part III: Conjugating nanoremediation to other remediation strategies -- Chapter. 12. Green-based nanomaterial and plants in nanophytoremediation strategies -- Chapter. 13. Main interactions of green nanomaterials and microorganisms on nanoremediation protocols -- Part. IV: Safety aspects and analysis of nanoremediation -- Chapter. 14. Supporting nanotechnology safety through nanoinformatics -- Chapter. 15. Conventional strategies of environmental pollution remediation versus Green Nanoremediation -- Chapter. 16. Using nanoremediation strategies: cost/benefit analysis -- Chapter. 17. Strategies to evaluate nanoremediation efficiency.

Sommario/riassunto

This book focuses on green nanoremediation addressing aspects related to the use of nanomaterials generated through green synthesis protocols to efficiently restore polluted environs. Nanomaterials' characteristics such as large surface area, capacity to easily reach into contaminated sites, good reactivity, and possibility of being developed to present photocatalytic activity and/or to deal with targeted substances by chemical surface modification are useful specially to perform remediation. As an alternative to conventional physicochemical methods, the green-based synthesis protocols reject the use of harmful reagents, prevent waste production, apply renewable energy source and/or materials, and consider in first place offering the smallest negative impact possible to living beings and to the ecosystem. Green synthesis in nanotechnology field involves the use of seaweeds, bacteria, cyanobacteria, yeasts, fungi, plants (living ones, biomass, extracts) and/or bio-derived products to generate the nanomaterials. The introductory chapter will be dedicated to nanomaterials' characteristics that enable them to be used in environmental remediation. The first part of the book will be dedicated to organic and inorganic pollution and the threats they pose to living forms; advantages, disadvantages and mechanisms of nanoremediation; comparison between conventional strategies of environmental pollution remediation and the green nanoremediation; carbon-based and non-carbon-based green nanomaterials capable of promoting environs' remediation; cost/benefits of using nanomaterials and nanoinformatics to a safe nanotechnology. The second part will be dedicated to green nanoremediation of water and soil, microbe-based, algae-based and plant-based synthesis of nanomaterials to nanoremediation. This part will also contain chapters dedicated to relevant nanomaterials for green nanoremediation protocols, nano-phytoremediation strategies, strategies to evaluate the efficiency of protocols related to this kind of remediation, main interactions of green nanomaterials and microbes during nanoremediation and, as a consequence of it, biocompatibility of green nanomaterials. This book's main purpose is to offer readers extensive knowledge on green nanoremediation as a feasible strategy to fight pollution's harmful consequences and clean environmental pollution, but also present the challenges that should be surpassed.