Preface

Nanomaterials have been realized as potential agents for several biological applications including therapy and diagnostics. Realizing the biological activity of nanomaterials and their importance for nanomedicine, the field of nanobiotechnology emerged to emphasize the toxic effects of nanomaterials and biological applications. The field of nanobiotechnology covers concepts on the biological synthesis of nanomaterials, characterization of biologically synthesized nanomaterials, and applications in the biological sector. The unique physicochemical characteristics of the nanomaterials offer interesting activities including antibacterial, antifungal, antiviral, and anticancer. Recent decades have evidenced tremendous advancements in nanobiotechnology research with applications in diagnosis, drug delivery, and therapy.

Considering the importance of the field, the book aims to provide a basic understanding about the about the interaction of nanomaterials with living cells/proteins/enzymes at a molecular level and factors influencing the interactions. This book covers specialized topics on protein nanoparticle interactions and factors influencing these interactions, shape- and size-dependent activity of the nanomaterials, and surface functionalization of nanoparticles for stability/activity in biological systems. An interesting chapter covering the molecular factors and mechanisms that drives the anticancer activity of the nanomaterials. Understanding the surface factors of nanomaterials influencing the biological activity will help in reverse engineering of nanomaterials with tailored surface characteristics.

Overall this would be an ideal textbook for nanobiotechnology courses for chemical, biochemical, and biomedical engineering students. Glossary and reasoning type questions have also been included at the end of each chapter. This book will also help scientists to understand advanced concepts in nanobiotechnology and nano-biomanufacturing with specific characteristics. This book discusses concepts on factors influencing better microbial interactions and surface

engineering approaches specifically focused on surface engineering of nanomaterials for biomedical applications.

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