1. Record Nr. UNINA9910633932403321

Titolo	Next-generation nanobiosensor devices for point-of-care diagnostics / / Gorachand Dutta, editor
Pubbl/distr/stampa	Singapore : , : Springer, , [2023] ©2023
ISBN	9789811971303 9789811971297
Descrizione fisica	1 online resource (252 pages)
Disciplina	610.28
Soggetti	Biosensors Nanostructured materials Point-of-care testing
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Intro -- Preface -- Contents -- About the Editor -- Recent Development in Detection Systems for Human Viral Pathogens from Clinical Samples with Special Reference to Biosensors -- 1 Preamble -- 2 Direct Cultivation Approach -- 3 Nucleic Acid-Based Approach -- 3.1 Real-Time PCR -- 3.2 Isothermal PCR -- 3.3 Droplet Digital PCR -- 3.4 Nucleic Acid Sequencing -- 3.5 CRISPR/Cas-Based Systems -- 4 Protein-Based Approach -- 4.1 Hemagglutination Assay -- 4.2 Hemagglutination Inhibition Assay -- 4.3 Virus Neutralization Assay -- 4.4 Lateral Flow Immunoassay -- 5 Biosensor-Based Approach -- 5.1 Micromechanical Biosensors -- 6 Current Challenges and Prospects -- 7 Conclusion -- References -- Nanobiosensors for COVID-19 -- 1 Introduction -- 2 Smart Materials for Sensor Technologies -- 3 Structure of SARS-CoV-2 -- 4 Infection Mechanism of SARS-CoV-2 -- 5 Nanotechnologies in the Diagnosis of COVID-19 -- 6 Nanotechnologies in the Treatment of COVID-19 -- 7 Inorganic Nanoparticles -- 8 Nanobiosensors for the Detection of Human Coronavirus (2019-nCoV, SARS/MERSCoV) and Influenza Viruses -- 9 Electrochemical Nanobiosensors -- 10 FET-Based Electrochemical Nanobiosensor -- 11 Cell-Based Electrochemical Nanobiosensor -- 12

Piezoelectric Nanobiosensors -- 13 Nucleic Acid Biosensor -- 14 Conclusion -- References -- Electrochemical Detection of Cancer Fingerprint: A Systematic Review on Recent Progress in Extracellular Vesicle Research from... -- 1 Introduction -- 2 Early Detection Is the Best Answer for Cancer -- 3 EV, a Promising Youngster in Liquid Biopsy -- 4 Conventional EV Detection Techniques -- 5 Electrochemical Detection of EVs -- 5.1 Enzyme-Based Amplification -- 5.2 Hybridization-Based Amplification -- Rolling Circle Amplification -- Strand Displacement Reaction Amplification -- Catalytic Hairpin Assembly -- Hybridization Chain Reaction -- DNA Nanomachines.
6 Challenges and Future Directions -- 7 Conclusion -- References -- Nano-biosensors for Diagnosing Infectious and Lifestyle-Related Disease of Human: An Update -- 1 Introduction -- 2 Design of Nano-biosensors -- 3 Clinical Application of Nano-biosensors -- 3.1 Application of Nano-biosensors for the Diagnosis of Infectious Diseases -- Detection of Viral Pathogens -- Detection of Bacterial Pathogens -- Detection of Other Pathogens -- 3.2 Nano-biosensors Used in Lifestyle Diseases -- Detection of Diabetes and Hypertension -- Detection of Inflammatory Disease -- Detection of Cancer -- Detection of Neurological Disorders -- Detection of Other Diseases -- 4 Advantages and Disadvantages -- 5 Conclusion and Future Direction -- References -- Design and Analysis of One-Dimensional Photonic Crystal Biosensor Device for Identification of Cancerous Cells -- 1 Introduction -- 2 Theoretical Formulation -- 3 Results Analysis -- 4 Conclusions -- References -- Smart Nanobiosensing for COVID-19 Diagnosis -- 1 Introduction -- 2 Coronavirus -- 2.1 Structure and Morphology -- 2.2 Origin, Natural Reservoirs, and Intermediate Hosts of SARS-CoV-2 -- 2.3 Transmission of Novel SARS-CoV-2 -- 2.4 Viral Pathogenesis and Cellular Replication -- 2.5 Specific Biomarkers for Diagnosing COVID-19 -- Viral Genomic RNA -- Viral Antigens -- Host Antibodies -- Predictive Algorithms for Discovering Potential Biomarkers -- 2.6 Clinical Specimens for COVID-19 -- 3 Contemporary Biosensing Devices for Detection of Coronaviruses -- 3.1 Plasmonic Biosensor -- 3.2 Field-effect Transistor Based Biosensor (BioFRT) -- 3.3 Quartz Crystal Microbalance Biosensors -- 3.4 Colorimetric Biosensors -- 3.5 Fluorescence-Based Biosensor -- 3.6 Other Prospective Electrical or Electrochemical Immunosensors for Detecting Coronaviruses -- 4 Comparative Analysis of Biosensors on a Few Technical Parameters.
5 Future Perspectives -- References -- Machine Learning-Enabled Biosensors in Clinical Decision Making -- 1 Introduction -- 1.1 AI-ML in Medical Sensors -- 2 Different Biosensors with Machine Learning -- 2.1 Electrochemical Biosensors -- 2.2 SERS and Other Spectra-Based Biosensors -- 2.3 Colorimetric and Fluorometric Biosensor -- 2.4 Cytometry Based Biosensors -- 3 Machine Learning for Biomedical Processing -- 3.1 Data Preprocessing -- Baseline Correction -- Data Standardization -- Data Compression -- 4 Non-neural Algorithm -- 4.1 PCA and LDA -- 4.2 Support Vector Machine (SVM) -- 4.3 Random Forests (RFs) and Decision Trees (DTs) -- 4.4 Hierarchical Cluster Analysis (HCA) -- 5 Artificial Neural Network Algorithms -- 5.1 Feed Forward Artificial Neural Network -- 5.2 Recurrent Neural Network -- 5.3 Convolutional Neural Network -- 6 Conclusion and Outlook -- References -- Recent Progress on the Development of Chemosensors -- 1 Introduction -- 2 Pyrene-Based Chemosensor for Detection of CO2 -- 3 Intra-molecular Hydrogen Bonding Stabilisation Based Fluorescent Chemosensor for Detection of CO2 -- 4 Squaraine-Based System for Detection of CO2 -- 5 -Cyanostilbene-Based Fluorescent Chemosensor for Detection of CO2 -- 6 pH Indicator-Based Sensors for

CO2 -- 7 Amine-Based Sensors for CO2 -- 8 Deprotonation-Assisted Sensors for CO2 -- 9 Chemosensors Based on Functional Material for Detection of CO2 -- 10 Chemosensors Based on Metal-Oxide Semiconductors for Detection of CO2 -- 11 Conclusions and Outlook -- References -- Medical Device and Equipment Sector in India: Towards Sophisticated Digital Healthcare Systems-An Overview -- 1 Introduction -- 2 Objectives -- 3 Methods -- 4 Scenario of Medical Device Sectors in India -- 5 Growing Opportunities in Medical Device in India -- 5.1 Medical Devices Sector and Growth -- 5.2 Health Insurance.
5.3 Hospital and Medical Infrastructure -- 5.4 Biotech and Digital Healthcare Sector -- 5.5 Refurbished Medical Equipment -- 5.6 Policies and Regulations Governing Healthcare Instruments and Devices -- 6 Medical Devices, India and Future Growth -- 6.1 Market Size and Export Scenario -- 6.2 Growth and Challenges in Medical Device Sector in India -- 7 Conclusion -- References -- Application of Radiopharmaceuticals in Diagnostics and Therapy -- 1 Introduction -- 2 Monitoring of Tissues and Organs by Radiopharmaceuticals -- 2.1 Single Photon Emission Computed Tomography (SPECT) -- 2.2 Positron Emission Tomography (PET) -- 3 Diagnostic Applications of Radiopharmaceuticals -- 3.1 Uses of Technetium-99m -- 3.2 Radiopharmaceuticals Used for Diagnosis of Cardiovascular Diseases -- Myocardial Perfusion Imaging (MPI) or Myocardial Perfusion Scintigraphy (MPS) -- 3.3 Radiopharmaceuticals Used for Study of Liver and Diagnosis of Diseased Condition -- 3.4 Radiopharmaceuticals Used in the Diagnosis of Cancer -- To Detect Cancerous Growth in the Body: Metabolic Study Using FDG -- Tumour Imaging -- 3.5 Radiopharmaceuticals Used for Diagnosis in Kidney Diseases -- 3.6 Radiopharmaceuticals for Diagnosis of Haematopoietic Disorders -- 3.7 Radiopharmaceuticals for Diagnosis of Lung Disorders -- 4 Therapeutic Applications of Radiopharmaceuticals -- 4.1 Delivery of Radionuclides by Nanocarriers -- Polymeric Nanoparticles -- Inorganic Nanoparticles -- Dendrimers -- 5 Role of Electrochemical Sensors for Detection of Radiopharmaceuticals -- 6 Radiotherapy -- 6.1 Treatment of Thyroid Diseases -- 6.2 Treatment of Metastatic Bone Pain -- 6.3 Treatment of Non-Hodgkin´s Lymphoma -- 6.4 Treatment of Hepatocellular Carcinoma -- 6.5 Treatment of Neuroendocrine Tumours -- 7 Conclusion -- References.