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-- Part III. Intercellular Communication in Cancer and Infection -- Chapter 13. Mechanisms of Intracellular Communication in Cancer and Pathogen Spreading -- Chapter 14. Intercellular Molecular Transfer Mediated by Extracellular Vesicles in Cancer -- Chapter 15. Tunneling Nanotubes: Implications for Chemoresistance -- Chapter 16. Tunneling Nanotubes – the Cables for Viral Spread and Beyond -- Chapter 17. Tunneling Nanotubes in Myeloid Cells: Perspectives for Health and Infectious Diseases -- Chapter 18. Intercellular Transport of Viral Proteins -- Chapter 19. Microbial Extracellular Vesicles in Host-Microbiota Interactions -- Chapter 20. Subversion from Within and Without: Effector Molecule Transfer from Obligate Intracellular Apicomplexan Parasites to Human Host Cells -- Chapter 21. Bacterial Infections in Patients Living with HIV -- Chapter 22. Theranostic Diagnostics.

Sommario/riassunto

This volume covers recent developments on the role, composition, and functional significance of intercellular and interorganellar transfer. It highlights the involvement of intercellular and interorganellar transfer in cell and developmental biology, differentiation, pathogen dissemination, shaping the genetic makeup of organisms, and the development of various diseases. Animals and plants evolved different communication mechanisms and transfer of molecules and organelles between cells and between organelles within the individual cells. Tunneling nanotubes (TNTs) in animals, discovered as recently as 2004, and their functional equivalent in plants, plasmodesmata, discovered over 100 years ago, are the membranous bridges that mediate the transfer of organelles, membrane patches, vesicles, DNA/RNA, and different molecules between cells. In addition, there are other means of transfer and communication between the cells, such as cytonemes, airinames, extracellular vesicles (exosomes), and others. Variations in cytoskeletal composition, morphology, modality, and connected cells suggest that these structures play a role in development, establishment of cell fate, progenitor cell differentiation, cell reprogramming, ferroptosis, generation of cancer stem cells, and various diseases. The exchange of intact membrane patches (trogocytosis) between cells of the immune system may modify the immune response. Additionally, the transfer of genetic information between nucleus and organelles and cells of different species can shape the species and evolutionary outcome. Viral and bacterial pathogens can hijack the inter-cellular transfer routes to spread more efficiently. Cell-to-cell transfer of animal and plant pathogens can also occur by the virological synapse (VS). These specialized pathogen-induced structures share similarities and differences with neurological and immunological synapses.