

Second Edition

Viruses

From Understanding to Investigation

Susan Payne

Viruses: From Understanding to Investigation, Second Edition presents the definitions and unique characteristics of viruses. The book includes major topics such as virus life cycle, structure, taxonomy, evolution, history, host-virus interactions, and methods to study. In addition, the book assesses the connections between the aforementioned topics and provides an integrated approach and in-depth understanding of how viruses work. The new edition also provides an expanded methods chapter containing new information on deep sequencing for in virus identification, mathematical formulas to calculate titers, and a description of quantitative PCR for enumerating viruses. The vaccine chapter has been updated to include vaccine efficacy, mRNA vaccines, and SARS-CoV-2 vaccine development. The viral pathogenesis chapter has been expanded to include mechanisms of virally induced cancers. Viral taxonomy sections have been updated and chapters revised to accommodate new virus family designations. New chapters include nucleocytoplasmic viruses (very large DNA viruses), replication of viroids, and COVID-19/SARS-CoV-2.

Key features

- Employs a comparative strategy to emphasize unique structural and molecular characteristics that inform transmission, disease processes, vaccine strategies, and host responses
- Presents a review of host cell, molecular biology, and the immune system
- Features topical areas of research, including genomics in virus discovery, the virome, and beneficial interactions between viruses and their hosts
- Includes text boxes throughout with experimental approaches used by virologists
- Covers learning objectives in each chapter

About the author

Susan Payne is an associate professor emeritus at Texas A&M University. Her primary research interests were molecular aspects of viral replication, pathogenesis, and evolution. For many years, her research focused on equine infectious anemia virus (EIAV), an equine retrovirus. She published extensively on genetic and antigenic variation and the molecular basis of EIAV pathogenesis. She also studied avian bornaviruses, negative strand RNA viruses that are the etiological agents of proventricular dilatation disease of parrots. Her long teaching career included courses for undergraduate and graduate students as well as participation in courses for medical and veterinary students. She was a member of the Bornavirus Study Group of the International Committee for Taxonomy of Viruses from 2014 to 2019.



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