
CHAPTER 43: IMMUNE SYSTEM

OVERVIEW

- **Reconnaissance:** finding foreign substance/pathogen.
- **Recognition:** identify foreigner.
- **Response:** respond appropriately.
- 2 evolved defenses:
 - **Innate immunity**
 - **Adaptive immunity**

ADAPTIVE IMMUNITY

- Aka **acquired immunity**.
- Recognition of traits specific to pathogens, using a vast array of receptors.
- Vertebrates only.

INNATE IMMUNITY

- Invertebrates and vertebrates.
- Insects:
 - Exoskeleton made of chitin.
 - Digestive system lined with chitin, low pH, presence of **lysozyme** – enzyme that digests walls of microbes.
 - **Hemocytes** circulate within the hemolymph and carry out **phagocytosis** – ingestion and digestion of foreign substances.
 - Hemocytes also secrete **antimicrobial peptides** that inactivate/kill fungi or bacteria.
 - Recognized by unique molecules on their cell walls.
 - Response varies with the class of pathogen.
- Vertebrates:
 - Innate defenses:
 - **Barrier defenses**
 - **Phagocytosis**
 - **Antimicrobial peptides**
 - Unique to vertebrates:
 - **Inflammatory response**
 - **Interferons**
 - **Natural killer cells**

BARRIER DEFENSES

Biology Guide 43 Immune System Answers

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computational biology in designing of drugs targets biomarkers for early detection and prognosis of a disease It highlights the applications of computational methods in deciphering the complex processes of the immune system and its role in health and disease This book discusses the most essential topics including Next generation sequencing NGS and computational immunology Computational modelling and biology of diseases Drug designing Computation and identification of biomarkers Application in organ transplantation Application in disease detection and therapy Computational methods and applications in understanding of the invertebrate immune system S Ghosh is MSc PhD PGDHE PGDBI is PhD from IICB CSIR Kolkata awarded the prestigious National Scholarship from the Government of India She has worked and published extensively in glycobiology sialic acids immunology stem cells and nanotechnology She has authored several publications that include books and encyclopedia chapters in reputed journals and books Biomedical Index to PHS-supported Research: pt. A. Subject access A-H ,1992 **Biomedical Index to PHS-supported Research** ,1993 Peterson's Guide to Graduate Programs in the Biological and Agricultural Sciences ,1990 *Peterson's Annual Guides to Graduate Study* ,1983

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Cumulated Index Medicus ,1998 *The HPV Vaccine On Trial* Mary Holland,Kim Mack Rosenberg,Eileen Iorio,2018-09-25 A Groundbreaking Guide to the HPV Vaccine and the Science Safety and Business Behind It Cancer strikes fear in people s hearts around globe So the appearance of a vaccine to prevent cancer as we are assured the human papillomavirus HPV vaccine will seemed like a game changer Since 2006 over eighty countries have approved the vaccine with glowing endorsements from the world s foremost medical authorities Bringing in over 2 5 billion in annual sales the HPV vaccine is a pharmaceutical juggernaut Yet scandal now engulfs it worldwide The HPV Vaccine on Trial is a shocking tale chronicling the global efforts to sell and compel this alleged miracle The book opens with the vaccine s invention winds through its regulatory labyrinths details the crushing denial and dismissal of reported harms and deaths and uncovers the enormous profits pharma and inventors have reaped Authors Holland Mack Rosenberg and Iorio drill down into the clinical trial data government approvals advertising and personal accounts of egregious injuries that have followed in countries as far flung as Japan Australia Colombia India Ireland the U K and Denmark The authors have written an unprecedented expos about this vaunted vaccine Written in plain language the book is for everyone concerned parents patients doctors nurses scientists healthcare organizations government officials and schools Ultimately this book is not just about the HPV vaccine but about how industry government and medical authorities may be putting the world s children in harm s way *Journal of*

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