Viruses & How to Beat Them: CELLS, IMMUNITY, VACCINES

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Viruses, ¿Can Virtual Classes Achieve? This, propagate, and vaccines

The first two paragraphs are in Hebrew, discussing the spread of viruses in universities and how they are handled.

The next few paragraphs are in English, discussing the effect of training on reading fluency and its uniqueness in the core language.

The paragraph then discusses the effect of training on writing fluency and its uniqueness in the core language.

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Lesson 1: Cells are the Units of Life

- Life is More Than Just Being Alive
- Measuring the Physical World in Units
- Atoms, Chemical Elements, the Periodic Table
- From Leeuwenhoek to Schleiden & Schwann - the “Cell Doctrine”
- Cells – the Units of Life
- Inanimate vs Organic Chemistry
- Water and Hydrogen Bonds
- Sugars, Lipids and the Cell Membrane
- Cell Organelles

Lesson 2: Macromolecules – from DNA to Proteins

- The Structure of Linear Polymers
- Condensation and Hydrolysis Reactions
- DNA – the Discovery that DNA is the Stuff Genes are Made of.
- Nucleotides: Structure and DNA Composition – Chargaff's Rules
- The Double Helix – Discovery and Structure
- Semi-Conservative DNA Replication
- Information Flow - From DNA to Proteins
- Amino Acids and the Polymeric Structure of Proteins
- The Genetic Code
- Ribosomes - Translating RNA to Proteins

Lesson 3: Viruses: Structure, Function, Infection & Replication

- Non-Contagious (Non-Communicable) Diseases – (NCDs)
- Getting Rid of Damaged Proteins via the Ubiquitin/Proteasome System
- Pathogens and Infectious Disease
Lesson 4: Human Viral Diseases
- Modes of Virus Transmission
- Smallpox
- Yellow Fever
- Ebola Hemorrhagic Fever
- Influenza
- Polio
- Why and How Epidemics Emerge

Lesson 5: Innate Immunity - Our First Line of Defense
- The Anatomy and Cells of Our Immune System
- Phagocytes and Lymphocytes
- Physical and Chemical Barriers: Skin and the Mucosa
- Mucus and Lysozyme
- Fleming’s Discovery of Penicillin
- Macrophages and Pathogen Recognition: PRRs and PAMPS
- Inflammation: Redness, Swelling, Heat and Pain
- How the Microbiome Participates in Innate Immunity
- Innate vs Adaptive Immunity

Lesson 6: Adaptive Immunity: Knocking Out the Enemy
- B-Cell Immunity: Antibodies Structure and Function
- How Antibodies Neutralize Viruses
- T-Cells and the MHC Reporting System
- IgE - Mast Cells and Fighting Worms and Allergy
- Immunodeficiency: Malnutrition, SCID and AIDS
- The Importance of Blood Tests and How They Work

Lesson 7: Vaccines – How They Work: Pros & Cons
- Vaccination – Basic Principles
- Eradication of Smallpox
- Live and Killed Polio Vaccines
• Subunit Vaccines
• Vaccine Challenges for the Future
• Pros and Concerns about Vaccines
• The Vaccine Schedule: Composition and Considerations