

Immune Responses to Malaria (Part 3)

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12:12 mins (13 Slides)

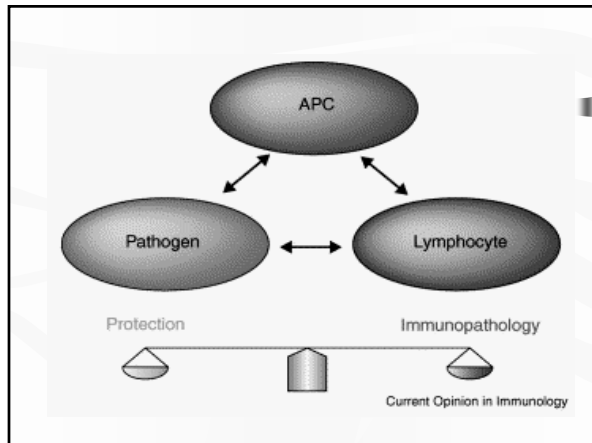
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School of Public Health and Tropical Medicine
a global commitment to public health

Immunity to Infectious Pathogens

- Extracellular organisms, e.g. blood-borne bacteria or protozoa, and helminths =
--ANTIBODY-MEDIATED IMMUNITY
- Intracellular organisms, e.g. obligate intracellular bacteria, protozoa, and viruses=
--CELL-MEDIATED IMMUNITY



“The Good, The Bad, The Ugly”

- Potentially protective cytokines (IL-12, IFN- γ , TNF- α), when over-produced (stimulate chronic inflammatory responses). Typically, type 1 cytokine responses against intracellular pathogens.

Cytokine Profiles

- Type 1: IL-2, IFN- γ , TNF- β , IL-15, IL-18 [IL-12, TNF- α , GM-CSF, IL-23]
- Type 2: IL-4, IL-5, IL-9, IL-10, IL-13 [IL-6, IL-14]
- Pro-Inflammatory: IL-1, IL-6, TNF- α [IL-12, IFN- γ , IL-8, IL-16, various chemokines]
- Anti-Inflammatory: IL-4, IL-10, IL-13; TGF- β (type 3)

Summary

- Type 1: delayed-type hypersensitivity, cytotoxicity (CTL), macrophage activation/monokine induction.
- Type 2: antibody production, proliferation of mast cells and eosinophils, suppression of monokines.

Types of Immune Responses

- **Type 1**
 - Good: anti-viral, anti-tumor, anti-intracellular pathogen.
 - Bad: chronic inflammation, autoimmunity mediated by T cells, allograft rejection.
- **Type 2**
 - Good: anti-inflammatory, anti-tumor, anti-extracellular pathogens.
 - Bad: allergies, autoimmunity mediated by antibodies.

Immune Responses to Malaria

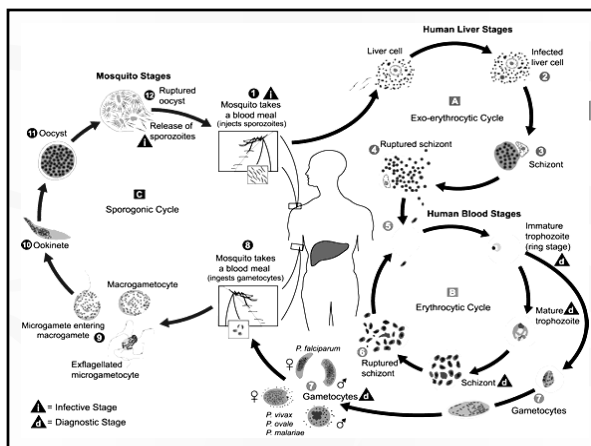
- Mechanisms of immunity to malaria
- Role of cytokines in immunity and disease
- T cell suppression in malaria

Effector Mechanisms in the Immunity to Parasites

- Essence of the host-parasite interaction: Continual balance between immunity and escape of the immune response that represents a confrontation between the host and the parasite.

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Protective Immune Responses

- Prevention of infection:
In general, the complexity of the parasite life cycle limits the capacity to develop solid immunity against either infection or disease.
- Unique antigens:
Expressed at each stage of the life cycle: immune responses are specific for each life cycle stage.

Protective Immune Responses

- Prevent or minimize morbidity and mortality:

Semi-immune state (immunity against disease but not against infection) typical of residents of hyperendemic regions depends on multiple exposures to the parasite over the course of one's life.