

Immunology and Celestial Frontiers

Immunology · Practice Test · 10 Questions

1. Which immune system component was observed in studies on astronauts to show altered gene expression during long-term spaceflight?

- A) Eosinophils
- B) T-lymphocytes
- C) Platelets
- D) Basophils

2. Microgravity environments, such as those found on the International Space Station, have been shown to inhibit the activation of which immune signaling molecule?

- A) Nuclear Factor-kappa B (NF- κ B)
- B) Albumin
- C) Hemoglobin
- D) Thyroxine

3. The study of 'Spaceflight-Associated Immune Dysregulation' focuses on the reactivation of which virus that stays latent in human hosts on Earth?

- A) Epstein-Barr virus
- B) Rhinovirus
- C) Influenza A
- D) Rotavirus

4. What physiological stressor common to the vacuum of space and cosmic radiation exposure is known to elevate serum cortisol, thereby suppressing immune cell function?

- A) Weightlessness
- B) Atmospheric pressure
- C) Ionizing radiation
- D) Solar wind

5. In the context of astrobiology and immunology, what term describes the potential for biological contamination of other planets by terrestrial immune-compromised microorganisms?

- A) Panspermia
- B) Planetary protection
- C) Biological shielding
- D) Exo-immunology

6. Which type of immune cell has demonstrated reduced motility and decreased ability to form immunological synapses in simulated microgravity conditions?

- A) Natural Killer cells
- B) Red blood cells
- C) Mast cells
- D) Osteoclasts

7. What is the primary immunological concern for human space explorers traveling beyond Earth's magnetosphere, which shields us from high-energy particles?

- A) Increased antibody production
- B) Chronic systemic inflammation
- C) Overactive bone marrow
- D) Enhanced cytokine release

8. Research on mice aboard the Space Shuttle indicated that microgravity negatively impacts the production of which primary antibody isotype?

- A) IgG
- B) IgE
- C) IgM
- D) IgA

9. What cellular organelle, essential for immune response regulation, has shown structural changes under the microgravity conditions of space?

- A) Nucleus
- B) Lysosome
- C) Mitochondria
- D) Ribosome

10. The 'Sun-Earth-Moon' orbital dynamics influence circadian rhythms; what hormonal regulator of the immune system is significantly disrupted by the artificial light cycles in space stations?

- A) Melatonin
- B) Insulin
- C) Glucagon
- D) Estrogen