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EFFECTS OF NEGATIVE AIR IONS (NAIS) AND ELECTRON DEPRIVATION ON HUMANS AND ORGANISMS ONBOARD INTERNATIONAL SPACE STATION

Abstract

As bioelectricity and the flow of electrons is the primary method of communication for human cells, humans and organisms typically evolve with a net neutral charge. Negative Air Ions (NAIs) or O₂⁻ with a captured electron and increase the psychological health of humans and organisms with the potential to relieve symptoms of allergies to dust, mold spores, and to reduce Particulate matter (PM) air pollutants. The natural NAI sources include (1) radiant or cosmic rays in the atmosphere; (2) sunlight including ultraviolet; (3) natural and artificial corona discharge including thunder and lightning; (4) the shearing forces of water (Lenard effect); (5) plant-based sources of energy. (Jiang, et al, 2018). Positive ions or those that have lost one or more electrons are primarily generated from air-conditioning systems, fluorescent lights, cell phones, televisions, computers, paint, air pollution, and electromagnetic devices (cell phones, fluorescent lights, computers, etc.) such as from the devices on the International Space Station (ISS).

Based on deductive reasoning and analysis of onboard ISS equipment, it is theorised that the ISS environment consists of primarily positive ions and very minimal NAIs, resulting in astronauts and organisms that experience long term exposure to positive ion environments and electron deprivation. As most oxygen in tanks on ISS is from electrolysis or splitting of imported H₂O, prolonged human exposure to electrical imbalances would impact astronaut medical data and understanding on effects of microgravity since the 1970's.

This literature review analyses the physiological effects from a lack of Negative Air Ions (NAI) and natural oxygen (O₂⁻) in the atmosphere on humans and candidate organisms such as plants, fungi, and bacteria species. Researchers assess potential differences in molecular behavior, electrostatic charges, and physiological effects between electrolysis-derived oxygen, plant-based NAI release system, and NAI's or O₂⁻ produced from moving water via the lenard effect, where negatively charged electricity is generated when water droplets collide with each other. The biomolecular and cellular processes associated with electron deprivation are referenced and correlated to reported symptoms from fluid shift, Spaceflight-Associated Neuro-Ocular Syndrome (SANS), and other spaceflight microgravity associated symptoms.

Researchers review potential O₂⁻ deprivation effects on plants, bacteria, and other organisms and suggest countermeasures to increase the NAI production, circulation, and bioavailability absorption. This research study and presentation represents one of the first studies evaluating the effects of NAI exposure on astronauts and organisms onboard the ISS and in space.