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A STUDY OF HUMAN SKIN COLOR, A NATURAL SUNSCREEN: PHYSIOLOGY, MOLECULAR EVOLUTION, PUBLIC HEALTH, AND STUDENT LEARNING

Juan Ayala and Soma Mukhopadhyay

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A Study of Human Skin Color, a Natural Sunscreen: Physiology, Molecular Evolution, Public Health, and Student Learning

Presenter: Juan Ayala (Poster Presentation)

Authors: Juan Ayala and Soma Mukhopadhyay

Faculty Sponsor(s): Soma Mukhopadhyay, PhD

Department Affiliation: Biological Sciences

ABSTRACT

Human skin coloration is a combination of pigmentation, ultraviolet (UV) exposure, gene expression and natural selection. Skin tone is also associated with several physiological processes, such as vitamin D synthesization, calcium homeostasis, maintaining proper blood folate concentration, and the production of serotonin. In recent years, the study of molecular evolution has become very significant not only to understand the human body but also becoming an integral part for understanding public health and other fields of medical science. Our goal of this project was to create an interactive course module for Anatomy and Physiology students to show how skin physiology was driven by evolutionary pressures. The module was also intended to show how exposure to some UV radiation is important for certain biological processes and for offering protection against cancer, as well as how, on the other hand, overexposure might cause damage and lead to cancer. Students were introduced to molecular evolution of skin color and the production of different pigments, eumelanin and pheomelanin to shield DNA from harmful UV light. Additionally, UVAB and UVC irradiance were measured and compared to the UV index which indicates the strength of UV radiation for the day to make people aware of the environmental factors around.

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Correspondence: Juan Ayala, Augusta University, 1120 15th St. Augusta, GA 30912, jayala@augusta.edu