THE NATURAL HISTORY OF MEDICINE: APPLICATIONS FROM EVOLUTIONARY BIOLOGY FOR ASPIRING PHYSICIANS

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Purpose: We developed and implemented a mini-elective course for first year medical students called “The Natural History of Medicine”. The goals of this course were to: 1) integrate modern principles of evolutionary biology into the medical curriculum, 2) highlight some of the clinical implications of human evolutionary history, and 3) give medical students access to the vast biological, paleontological, and anthropological research collections of a major natural history museum.

Methods: The course was divided into four sessions, each lasting two hours. Each session included a formal lecture, followed by hands-on activities utilizing items from the scientific collections of the Carnegie Museum of Natural History to amplify and embellish points made during the lecture. The course was restricted to a small number of students to facilitate discussion and interaction with rare and valuable museum specimens. The first session addressed fundamental principles of evolutionary biology as they relate to biomedical research and clinical practice. The second and third sessions investigated different anatomical systems (including the upper and lower limbs, the temporomandibular joint, and the eyes, ears, and nose) in detail, placing human anatomy within an evolutionary context to understand how certain medical conditions arose as a result of human evolution. The fourth session explored the health status of archaeological populations, highlighting how certain diseases that were once common and widespread are now primarily restricted to the developing world. Lectures were designed to be interactive, allowing students and faculty to elaborate on points of particular interest and to examine relevant objects from the museum’s collection. Students then pursued one topic at the intersection of evolutionary biology and medicine in greater detail, culminating in an essay based on their library research and consultation with the faculty.

Results: Both students and faculty enjoyed the course. Moreover, based on the diversity of student essays and discussions during class, it is apparent that everyone involved in the course developed a much deeper appreciation for the numerous ways in which evolutionary biology can inform medicine (and vice versa). The innovative nature of this unique collaboration between a medical school and a natural history museum was immediately grasped by a much wider audience, as the course drew attention from both local and national print and broadcast media.

Conclusions: Biomedical research and the clinical practice of medicine, like all other fields of biology, rely upon fundamental principles of evolution to make sense of a diverse range of phenomena. “The Natural History of Medicine” marks the first time that these unifying evolutionary concepts have been integrated into a medical school curriculum with the benefit of museum objects as an important didactic tool.