Pitt professor contends biological underpinnings

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Jeffrey H. Schwartz, University of Pittsburgh professor of anthropology in the School of Arts and Sciences, is working to debunk a major tenet of Darwinian evolution. Schwartz believes that evolutionary changes occur suddenly as opposed to the Darwinian model of evolution, which is characterized by gradual and constant change. Among other scientific observations, gaps in the fossil record could bolster Schwartz's theory because, for Schwartz, there is no "missing link."

In an examination that further challenges the Darwinian model, Schwartz and cowriter Bruno Maresca, a professor of biochemistry at the University of Salerno, Italy, examine the history and development of what the writers dub the "Molecular Assumption" (MA) in the article "Do Molecular Clocks Run at All? A Critique of Molecular Systematics," to be published in the Feb. 9 issue of *Biological Theory*.

The MA became a veritable scientific theory when, in 1962, biochemists Emil Zuckerkandl and Linus Pauling demonstrated species similarity through utilizing immunological activity between the blood's serum and a constructed antiserum. Upon observing the intensity of the serum and antiserum reactivity between human, gorilla, horse, chicken, and fish blood, Zuckerkandl and Pauling deduced "special relatedness"—the more intense the reaction, the more closely related the species were supposed to be.

Fish blood was most dissimilar, so it was assumed that the fish line diverged long before the other species. Human and gorilla blood were the most similar, meaning both species had the least amount of time to diverge. Ultimately, the Darwinian model of constant evolutionary change was imposed upon the static observation made by Zuckerkandl and Pauling.

To date, the scientific community has accepted the MA as a scientific truth. It is this assumption, which Schwartz is contemplating: "That always struck me as being a very odd thing—that this model of constant change was never challenged." Schwartz has his own theories regarding evolution, which are backed by recent developments in molecular biology.

Multicellular animals have large sections of genomes, the genetic material of an organism, which control their development. Schwartz argues that the structure of the genome does not keep changing, based on the presence of stress proteins, also known as heat shock proteins. These proteins are located in each cell, and their main function is to eliminate the potential for cellular error and change via maintaining normal cellular form through protein folding.

This regular cellular maintenance is what Schwartz points to regarding his refutation of constant cellular change. "The biology of the cell seems to run contrary to the model people have in their heads," says Schwartz, and he contends that if our molecules were constantly changing, it would threaten proper survival, and strange animals would be rapidly emerging all over the world. Consequentially, Schwartz argues that molecular change is brought about only by significant environmental stressors, such as rapid temperature change, severe dietary change, or even physical crowding.

If an organism's stress proteins are unable to cope with a significant change, the genomic structure can be modified. However, Schwartz notes, a mutation also can be recessive in an organism for many generations before it is displayed in its offspring. Whether or not the offspring survives is another matter. If it does in fact live, the presence of this genetically modified organism is not the product of gradual molecular change but a sudden display of the genetic mutation, which may have occurred myriad years prior.

However, it is not only the current molecular theory that intrigues Schwartz, but the failure of the scientific community to question an idea that is more than 40 years old: "The history of organ life is undemonstrable; we cannot prove a whole lot in evolutionary biology, and our findings will always be hypothesis. There is one true evolutionary history of life, and whether we will actually ever know it is not likely. Most importantly, we have to think about questioning underlying assumptions, whether we are dealing with molecules or anything else," says Schwartz.

Source: University of Pittsburgh

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