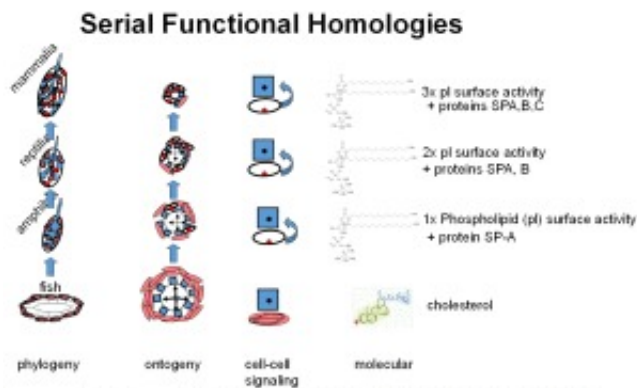


A central theory of biology

Like all sciences, Biology began with the systematic categorization of plants and animals, beginning with Linnaeus's Binomial Nomenclature. That process was based on the appearance of organisms, which we know is subjective due to the way that we use our senses in order to determine form and function. In the paper on A Central Theory of Biology I have proposed a novel way of looking at biologic systems based on their 'history', starting with unicellular organisms, moving forward based on cell-cell communication as the origin of multicellular plants and animals. All complex life begins as one cell either through asexual or sexual reproduction, growing into multicellular organisms through cell-cell signaling mediated by soluble growth factors that determine the patterns of physiologic structure and function. The significance of such interactions is seen when there are changes in the environment such as the rise in carbon dioxide and oxygen over the last 500 million years, altering the physiology of organisms.

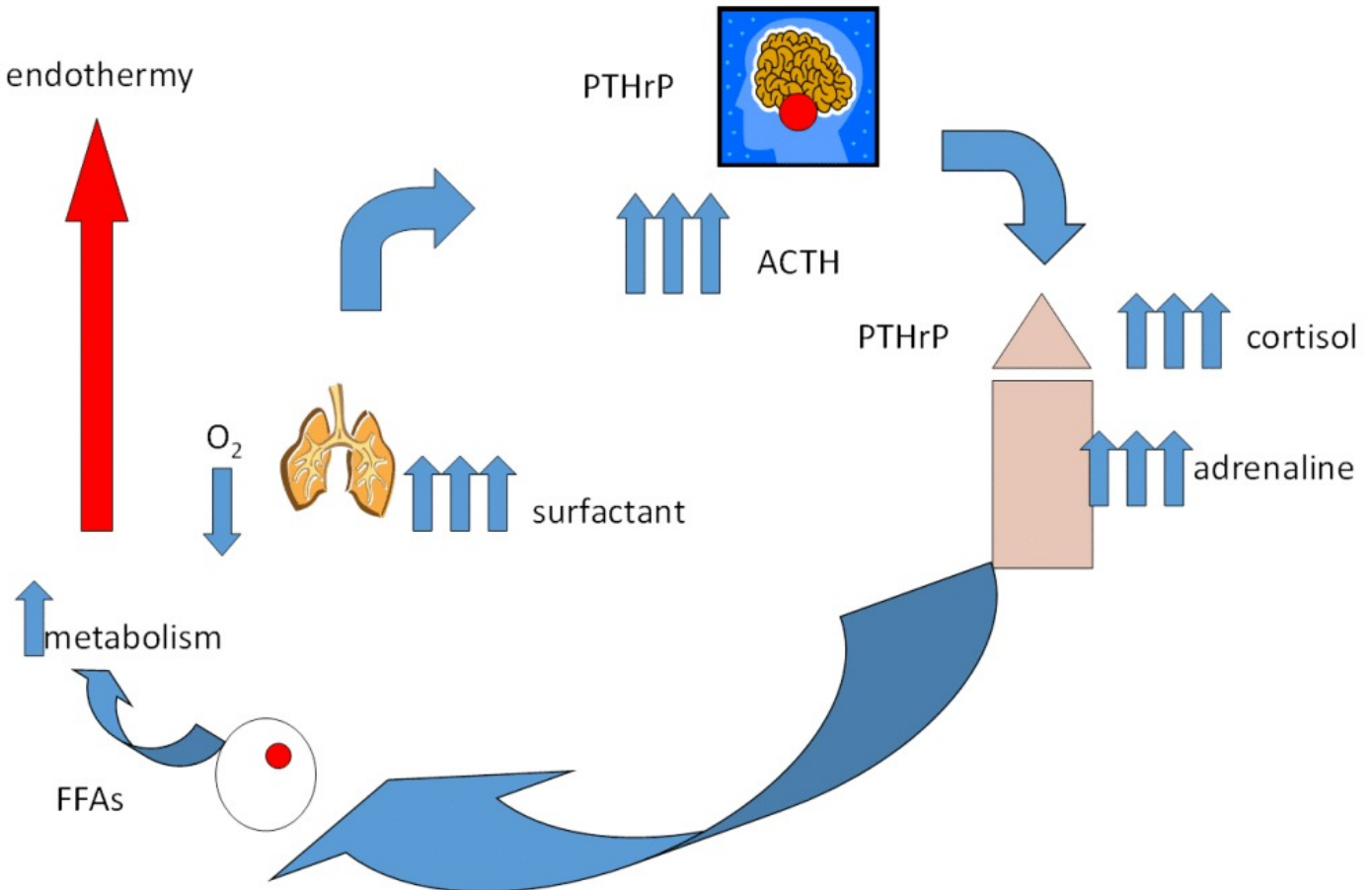


From left to right, is the phylogeny of the lung from the swim bladder; the ontologic development of the lung; the cell-cell interactions that mediated the ontogeny and phylogeny of the lung; the changes in lung surfactant lipid that facilitated the evolution of the alveoli for gas exchange

For example, the increasing production of carbon dioxide by Blue-Green algae caused the acidification of the oceans, forming carbonic acid; the carbonic acid leached calcium from the bedrock, forcing unicellular organisms to adapt to the rising calcium levels in the seawater by forming channels to regulate the levels of calcium within them. Rising levels of oxygen in the atmosphere subsequently caused the evolution of peroxisomes, which protected single celled organisms against oxidant stress. Ultimately, the rising levels of carbon dioxide caused a 'greenhouse effect', raising the atmospheric temperature, causing the drying up of bodies of water globally. That event caused the transition of plants and animals from water to land approximately 300 million years ago. In our ancestors the vertebrates that event caused both structural and genetic changes that specifically affected the evolution of the lung, necessary for the adaptation to land. The structural and functional evolution of the swim bladder of fish to the lungs of amphibians,

reptiles, mammal and birds is documented by specific gene duplications that give insight to the how and why physiologic changes occurred.

Integration of Lung, Pituitary, Adrenal Physiology



Evolution of Warm-Bloodedness. During periods of deficient lung evolution the resulting hypoxia stimulated pituitary ACTH stimulation of adrenocortical cortisol, increasing adrenaline production by the adrenal medulla. Adrenaline stimulated surfactant secretion by the lung alveoli, relieving the hypoxia; in tandem, the adrenaline stimulated fatty acid (FFAs) secretion by fat cells, increasing metabolism and body heat, evolving into endothermy.

More importantly, this approach to understanding how the specific traits of land vertebrates evolved has given insight to the evolution of warm-bloodedness in mammals and birds for the, leading to speculation about the underlying nature of bipedalism and the evolution of the central nervous system. With this causal perspective, physiology is now predictive rather than descriptive, offering the opportunity to understand the true nature of biologic systems for the first time. And since

biology is the scientific basis for medicine, this way of understanding physiology from its developmental and phylogenetic origins forward will change the way that we diagnose and treat illness and formulate medications based on evolutionary principles.

Publication

[A central theory of biology.](#)

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Med Hypotheses. 2015 Jul