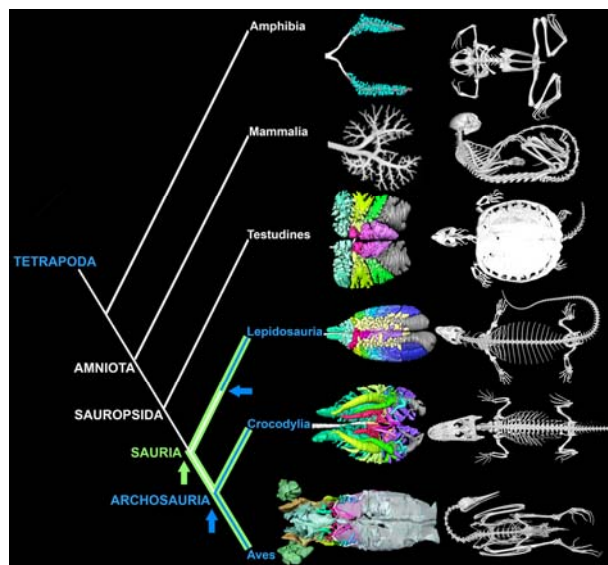




Patterns of Airflow in the Lungs of Tetrapods

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In contrast to the tidal movement of respiratory gases in mammalian lungs, gases flow unidirectionally through most of the airways of birds. Until recently this pattern of flow was considered an avian feature that may help birds meet the high demands for oxygen requisite for powered flight. However, we have discovered unidirectional flow in the multi-chambered lungs of crocodilians and monitor lizard, as well as the simple lungs of the green iguana, indicating we do not understand the evolutionary history of this trait or its functional significance. Fluctuations in atmospheric oxygen may have been a driver in the evolution of diffusion-dependent processes of respiration; respiration in turn affecting the evolution of aerobic and locomotor capacities, body size, and other key life-history traits that underpin ecomorphological diversification. Thus, retrodicting the history of unidirectional flow may shed light on a major transition in the history of life: the usurpation of synapsids by the archosaurs during the Mesozoic Era.



Thursday December 12th at 10.15 (coffee room at Zoophysiology)