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The *Nature* Insight 'Frontiers in Biology' aims to cover timely and important developments across biology, ranging from subcellular molecular mechanisms to whole-organism physiology, and biomedicine.

The Insight begins with a review on the amygdala, a brain structure that responds to both negative and positive associations during functionally different behaviours. This structure has assumed a complex position within the circuits underlying emotional and motivational processes. Embracing this complexity, Patricia Janak and Kay Tye reveal how advances in genetic targeting, anatomical tracing and neuronal activity modulation are providing the means to define a road map for this important structure's complex connectivity.

David Artis and Hergen Spits then go on to review the rapidly moving field of innate lymphocyte biology. Innate lymphoid cells are the most recently identified constituents of the innate immune system. They have important roles in protective immunity and inflammation, integrating innate and adaptive immune responses and controlling tissue homeostasis in infection, chronic inflammation, metabolic disease and cancer.

The ability to sense and to respond to nutrients such as glucose, amino acids and lipids is essential for life. David Sabatini and colleagues explore how mammals sense these nutrients and discuss the deregulation of sensing mechanisms in disease.

Programmed cell death is essential for many physiological processes, including the shaping of developing organs, epithelial cell renewal and lymphocyte selection. Manolis Pasparakis and Peter Vandenabeele discuss the regulation, initiation and execution of different types of regulated cell death with a particular focus on the non-apoptotic cell-death process necroptosis.

DNA methylation is an epigenetic modification that is generally associated with gene silencing. Recent technological advances have enabled the generation of genomic maps at unprecedented resolution that should help resolve its specific functions. In the final Review, Dirk Schübeler summarizes our current understanding of the regulation and function of DNA methylation, and discusses its utility as a cellular marker in basic biology and biomedicine.

Alex Eccleston, Noah Gray, Sadaf Shadan & Ursula Weiss
Senior Editors

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