

Account for the ‘dark matter’ of biology

Philip Ball correctly opines of DNA that “we should lift some of the awesome responsibility for life’s complexity from its shoulders” (*Nature* **496**, 419–420; 2013). In addition to the ‘-omes’ he lines up for this responsibility, other components that are vital to all life forms are the metabolome (small-molecule intermediates), the lipidome (including cellular membranes) and the glycome (massive arrays of sugar chains on cell surfaces and extracellular compartments).

We now know that these other ‘-omes’ mediate much of the diversity and complexity found in natural biological systems. Ball makes an apt analogy to the 1998 discovery that the expansion of the Universe is accelerating, which forced cosmologists to think beyond the standard model and realize that dark matter and dark energy actually dominate many key processes.

Likewise, it is time for more biologists to venture beyond the standard model of biology (involving DNA, RNA and proteins) that has served us so well, and take into account the ‘dark matter’ of the biological universe — as well as the physical, biological, social and cultural environment.

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