

# nature REVIEWS

## NATURE REVIEWS GENETICS

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Genetics has a long history: along the way we have had to change not only our understanding of the principles of inheritance but also the way in which we conduct our research. We are no longer satisfied with merely understanding the function of one gene and its product(s) or the workings of a single pathway. Although we have always suspected that molecules or pathways do not work in isolation, it is only recently that the practical and theoretical tools have been developed that allow us to get to grips with cellular processes in their entirety.

Systems biology is a frequently-heard term, coined to describe exactly this approach. On page 84, we highlight two recent papers — the *Drosophila* and *C. elegans* interactome maps — which are an example of the resources that are necessary if researchers are to address the problems that interest them in a ‘global’ manner.

On the same page, we have highlighted a paper in which the authors look at the co-expression of genes from six distantly related, ‘post-genomic’ organisms. As well as helping gene annotation, this macro-evolutionary comparison allows us to define conserved transcriptional modules and takes us into the realm of network biology — a discipline of biology that borrows heavily from graph theory, itself a branch of mathematics. The nature of biological networks is de-mystified on page 101 by Albert-László Barabási and Zoltán Oltvai. The authors argue that the emerging universal laws that seem to govern these networks pave the way towards a better understanding of the biology that underlies both normal and pathological processes. The message is undoubtedly appealing, although it remains to be seen exactly how useful this approach will be.



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