results) might be prevented (or at least attenuated) by nutritional intake (or supplementation) of phytochemicals – in theory. This field, including the experimental and clinical results presented in this book, suffers from the fact that conclusions are being drawn from in vitro and animal studies, or from very small clinical human studies. However, as partly exemplified in the book, technical solutions and theoretical platforms have now emerged to approach this with genomic and metabolomic techniques.

The material in each chapter is well structured, with an introduction followed by experimental details and ending with results and conclusions. The reader should, however, take care not to overestimate the findings presented as they seem to be – and in many cases are – drawn from pilot studies.

Several irritating misspellings and mistakes in botanical and chemical names can be found throughout the book (such as camellia sinensis and Ribes nigræ, or naringin instead of naringenin and misplaced stereochemistry indications), which might pass unnoticed by the unspecialized reader and cause misunderstandings.

According to the back cover the book ‘provides pragmatic information for food companies, supplement manufacturers, and researchers interested in developing functional foods and nutraceuticals for the aging population’. This promise holds true for the three initial chapters, but the rest of the book presents basic research still a long way from practical applications.

In conclusion, the book presents some interesting avenues towards tackling the health problems of the world’s ageing population – but the significance of the findings presented will be reliant on further studies. It should be noted that since the conference, the US Food and Drugs Administration has approved a green tea ointment for treatment of genital warts – which, even though the indication is outside the scope of the book, encourages further research on botanical products promoting human health.

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doi:10.1093/aob/mcp248
Published electronically: 29 September 2009

Plant systems biology. Annual
Plant Reviews, Volume 35
Coruzzi GM, Rodrigo A. Gutiérrez RA. eds. 2009.

Many of us have been mired in arguments over the last few years about what systems biology really is, and what it is not. So first, let us specify what choice the editors have made when assembling this new book: they emphasize approaches taking advantage of ‘omics’ data sets to decipher the properties of their favourite systems. Most chapters have been written by and for wet-lab experimentalists, rather than mathematicians or computer scientists. Thus, the book does not describe quantitative modelling that studies the behaviour of a few connected components with high-resolution parameters, nor does it deal with synthetic biology.
The book is structured in two parts. The first presents an overview of systems biology and contains four chapters. The two first introductory sections appropriately cover the basic notions of omics, network biology and data integration; however they are partly redundant and could have been advantageously merged. The third chapter aims at illustrating how specific projects in prokaryotic research have paved the way towards building system-level understanding. Unfortunately, this part rather misses its target: instead of highlighting showcase achievements that could instruct plant researchers, this long chapter – 70 pages out of a total of 350 – provides too many lengthy historical accounts about the incremental dissection of biological processes specific to bacteria, which are often only remotely linked to systems approaches, with the exception of data-driven models of regulatory networks. The fourth chapter is far more instructive and summarizes the collaborative work of several groups over the past few years to define functional modules involved in the early embryogenesis of the worm *Caenorhabditis elegans*. These elegant studies combine large-scale reverse genetics, yielding digital phenotypic signatures with gene expression and protein interaction data, and result in the unsupervised identification of functional modules at play during the initial embryonic divisions. This example is particularly relevant, because *C. elegans* and the plant model *Arabidopsis thaliana* are multicellular organisms of similar complexity, but the worm system-level research is arguably slightly ahead and should thus inspire plant scientists.

The second part of the book is better balanced and focuses on plant research: although topics are always put into a broader perspective (e.g. in terms of software tools and resources listed), the examples pertain to plants in general, and often to *Arabidopsis* in particular. Briefly, the topics covered are the visualization and mining tools for the interpretation and integration of omics data; the characterization of transcription factors and cis-regulatory elements that together form transcriptional networks; the profiling of microRNA populations matched with their potential targets; the various technologies for proteome profiling; the metabolome, its relationship with the proteome, metabolome profiling techniques and downstream applications, the fingerprinting and modelling of networks including metabolite profiles; and the systematic analysis of the elemental composition, dubbed ionomics, applied to plants samples.

The last two chapters each have a different outlook. The first describes how the root constitutes a fine tractable biological system to investigate and model the factors that drive the co-ordinated development of an organ. It reviews how the interaction between the different cell types can be analysed through transcriptional networks; how the kinematic analysis of root growth can be streamlined because the position, size and division of root cells can be relatively easily imaged; and how the modelling of the auxin transporter network can predict the phenotypes of corresponding mutants. The final chapter explores the interplay between components across the very different scales defining biological systems: molecules, regulatory mechanisms, organs (physiology), entire organisms (phenotype) and ecological niches (environment). It highlights the importance of variation and adaptation, which are rarely taken into consideration in experimental settings, and advocates the adoption of systems approaches to study ecosystems.

To conclude, the book delivers an accurate and up-to-date review of the main progress made by plant researchers to capture, interpret and integrate different types of omics data, and to model plant biological processes taking into consideration multiple components of the system under scrutiny. However, the topics that the book does not address indicate indirectly what has yet to be tackled. As stated by one of the authors, plant biologists are still setting the stage for systems biology, but the transition between functional genomics and whole-system modelling will soon be over, and plant scientists must be prepared to reap the benefits of their efforts in that area. This volume of the Annual Plant Reviews series dedicated to *Plant systems biology* is a valuable contribution to this grand goal.

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