An interesting experience he relates in the book is about the first time on his own in a laboratory in Paris. There he found that cells could multiply till about a 100 in sulfanilamide before they were inhibited. He says, 'Not being a good biochemist, I failed to see the implications of this finding […]. This could have led me to explain the mode of action of sulfonamides, a discovery made a year later by the British biochemist D. D. Woods. It was the first – not last – lost opportunity in my scientific career. It is a risk that faces the naïve scientist venturing into a new field without the required knowledge of the background.' Reading this, we were filled with enthusiasm as well as trepidation. It showed us how easy it is to make a discovery as well as to miss one. It taught us that one must forever be asking questions and never take anything for granted. According to Luria, 'One defines a problem that seems significant in its implications and worth exploring; then one looks for a system […] that offers a promising point of attack.'

Another unforgettable piece of advice is his description of 'Beadle and Tatum's work' on gene control of organism traits. Beadle had earlier tried to tackle this question by working on the pigmentation in the eyes of fruit flies. The problem proved too difficult, so he now used common bread mould, *Neurospora*. 'Beadle's shift to bread mold – which incidentally illustrates the opportunism of scientific research, shifting from one material to another in pursuit of the solution of a general problem – was an astute and brilliant move.' In this simple example, he has competently explained the essence of the unity of living organisms.

Apart from research, we learn about politics, literature, art, science, ethics, religion and so much more from this book. Luria maintains a clever balance between modesty and self-esteem. His clear ardour for science can be seen in every other thing. One interesting statement was 'The world of science may be the only participatory democracy'.

An admirable fact about Luria – from the beginning, he foresaw the integration of disciplines. He speaks often of the usefulness of the analytical view of a physicist in biology and the vital need for chemistry in biochemistry. In fact, he was the one who made James Watson (co-discoverer of the DNA structure with Francis Crick) study biochemistry.

Luria, in his life, met and befriended a large number of great minds which are held in such esteem today. His descriptions of them are quite refreshing and unexpected. It was pleasant to read these personal tidbits about such revered men and women. He spoke his mind in every page, whether his thoughts were controversial, biased or irreverent. For example Luria says, 'I have a nasty suspicion that a good deal of traditional subject matter is kept in textbooks because it provides […] quiz questions.' He himself maintained a singular dislike towards mugging throughout his life.

His book is an honest and unbiased exploration of himself. It gives many insights into various aspects of life, and is definitely a must read. The reverence with which he speaks of science and his colleagues is inspiring. Reading this book, it feels like we actually get to know Luria. He ceases to be a 'Nobel-Prize winner' and rather becomes an admirable man who has much to teach us about life.

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Annual Review of Microbiology, 2012. Susan Gottesman, Caroline S. Harwood and Olaf Schneewind (eds). Annual Reviews, 4139 El Camino Way, P.O. Box 10139, Palo Alto, California 94303-0139, USA. Vol. 66. x + 533 pp. Price: US$ 89.

The 66th volume of *Annual Review of Microbiology* contains 25 reviews, contributed by 55 experts, which encompass various topics ranging from biology of conductive microorganisms, bacterial transcription, *Trypanosoma brucei* editosome analysis, microbial drivers of plant–soil feedback, fungal RNA interference pathways, peroxisome biogenesis in eukaryotic microorganisms to physiology and diversity of ammonia-oxidizing archaea.

Another alluring feature of this book is three wonderfully written memoirs by Agnes Ullmann, Peter Lengyl and Gerald Hazelbauer wherein they discuss their contributions towards elucidating the role of adenylate cyclase in bacterial virulence, deciphering the genetic code and delineating the molecular mechanisms of bacterial chemotaxis, respectively. While reflecting upon their most famous findings, Ullmann, Lengyl and Hazelbauer take readers along on the path to these discoveries as well as to their other arduous not-so-successful journeys. These articles will not only inspire the next generation of scientists but also make us all aware of the privileges that we take for granted. Susan Gottessman's remark in the Preface of the book 'A reread of Agnes Ullman's chapter may be a good antidote for a tendency to complain' concisely sums it all up.

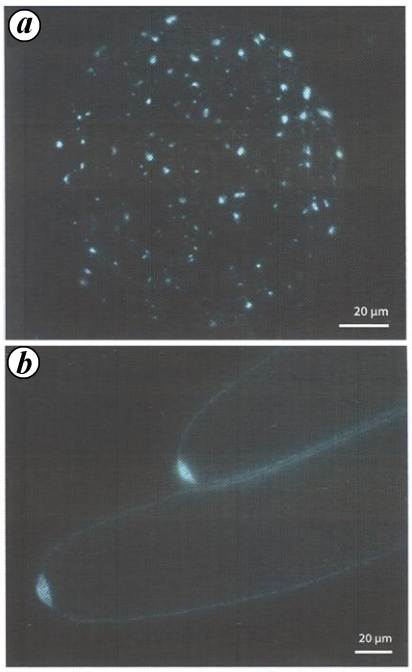
Multidrug resistance, owing to the overexpression of broad-specificity ATP-binding Cassette (ABC) transporters, is the most common cause for the failure of anticancer, antibacterial and antifungal therapy. Rajendra Prasad and Andre Goffeau delve into structure, physiological roles, substrate promiscuity and transport mechanisms of the yeast family of ABC multidrug efflux pumps, also referred as pleiotropic drug resistance (Pdr) transporters. Presence of 2–20 genes in the genome of each fungal species, which code for Pdr proteins belonging to at least 10 unique phylogenetic clusters, underscores their essential roles in cell physiology. They opine that future research in the fungal drug resistance arena should be geared towards systematic large-scale expression, purification and crystallization of Pdr efflux pumps and their interaction analyses with membrane lipid constituents.

A brilliant account of origin and diversification of eukaryotes is compellingly told by Laura Katz wherein after a general introduction to three major domains of the tree of life, viz. Bacteria, Archaea and Eukaryota, she reviews our current understanding of the origin of eukaryotes based on feature analysis of the last eukaryotic common ancestor (LECA), evolution of photosynthesis with eukaryotes and relationships among extant eukaryotic lineages. While dwelling on the fact that microbes compose bulk of the genetic diversity, she raises concerns regarding naming of the higher taxa, based on limited data, by few researchers to include recently identified clades and emphasizes the importance of compre-

hensive taxon sampling to comprehend the root and the structure of the eukaryotic tree of life.

Readers interested in bacterial physiology will find reviews on bacterial persistence and toxin–antitoxin loci, evolution of two-component signal transduction systems, structure and regulation of type VI secretion system and twitching motility in *Pseudomonas aeruginosa* insightful with excellent figure illustrations and comprehensive bibliographies. Esther Angert's discourse on maintenance of cytoarchitecture and DNA dynamics in large-sized (>200 μm diameter) bacteria, via massive polyploidy and predominant distribution of nucleoids toward the plasma membrane, makes an engaging read and invokes questions on existence and evolutionary implications of eccentric life styles and deviant cell types in microbial community.

Additionally, Ma *et al*. in their chapter on vaginal microbiota focus on the mutualistic relationship between human vagina and the resident vaginal bacterial community and development and use of cultivation-independent approaches to identify vaginal microflora. They accentuate the need to define vaginal health on the basis of composition as well as function of the vaginal ecosystem and dissociate it from the mere presence of *Lactobacillus* species.



Large bacteria, stained with DAPI, display a similar arrangement of their cellular DNA. ***a***, Numerous nucleoids found in the peripheral, active cytoplasm of a spherical *Thiomargarita namibiensis* cell are associated with the plasma membrane. A surface layer focal plane of a small *T. namibiensis* cell is shown. ***b***, Half of a large *Epulopiscium* sp. type B mother cell.

Reviews on Herpesvirus transport to nervous system, Polyomaviruses large T antigens and Recognition of viral pathogens by host innate immune system will appeal to those interested in the study of host–virus interactions.

My personal favourite is Derek Levley's review on electromicrobiology, an emerging exciting discipline of science, which studies unique electrical properties of microbes and their interactions with external electronic devices. Several microorganisms are capable of donating to and accepting electrons from electrodes without any external aid. For example, two metal-reducing bacteria, *Shewanella oneidensis* and *Geobacter sulfurreducens*, predominantly interact with electrodes via release of soluble electron-shuttling molecules, flavins, and outer-surface, redox-active *c*-type cytochromes, respectively. Furthermore, *G. sulfurreducens* biofilms, owing to the presence of pili, capable of long-range electron transport along their length, display conductivity similar to that of synthetic conducting polymers. This microbe-electrode electron exchange holds great promise for the areas of bioenergy, sensing and bioremediation, anaerobic microbial ecology and microbial electrosynthesis. Fittingly enough, while providing a timely overview of this field, Derek Levely cautions to tread carefully and avers that delineation of basic mechanisms of electromicrobiology is imperative for practical advancements.

The book culminates with a review on the use of a soil bacterium, *Corynebacterium glutamicum*, as a biocatalyst in the postgenomic era. Although *C. glutamicum*, an industrial work horse, has historically been used for the production of amino acids, nucleotides and vitamins, sequencing and analysis of its complete genome has paved way for new applications including commercial production of fuels and chemical building blocks for use in transport and polymer industries. The current chapter not only summarizes the information available on corynebacterial systems biology but also brings unique, economically beneficial features of *C. glutamicum* physiology (ability of growth-arrested cells to produce several metabolites under oxygen-deprived conditions and concurrent metabolization of diverse carbon sources) to the forefront. Vertès *et al*. discuss how rationale-based design and inverse metabolic engineering may be used to improve the industrial robustness, homeostasis and biosynthetic power of *C. glutamicum* strains in order to fully exploit the economic potential of this microbe.

Overall, reviews in this book are superbly written, highly informative and provide ample fodder to inspire budding young microbiologists.

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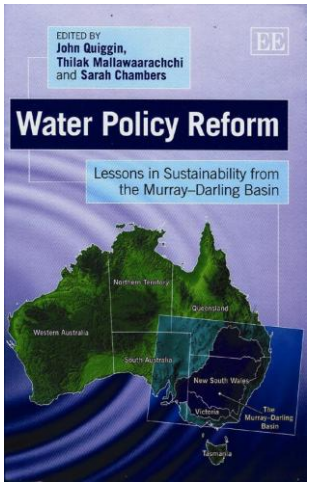

Water Policy Reform: Lessons in Sustainability from the Murray–Darling Basin. John Quiggin, Thilak Mallawaarachchi and Sarah Chambers (eds). Edward Elgar Publishing Limited, The Lypiatts, 15 Lansdown Road, Cheltenham, Glos, GL50 2JA, UK. 2012. xix + 238 pp. Price not mentioned.

The book under review is an edited volume that is the outcome of a workshop held by the Risk and Sustainable Management Group of the University of Queensland, Australia to discuss the guide to the Murray–Darling Basin Plan and to input into the water policy process. The guide to the plan released in October 2010 was opposed by farmers of