two chapters deal with the questions of whether we carry the cause of cancer in our cells and with activation of cancer causing genes. However, several biological explanations are mystifying rather than illuminating, leaving the reader confused and bewildered, and the factual content is faulty: here, it is stated that regulatory sequences are also carried inside a gene and called introns, that the product of v-*src* is a phosphorylase, that growth factors are bound to the cell membrane and that oncogene activation by LTR's is an 'only artificial possibility'. The normal function of anti-oncogenes is described as inhibiting the overproduction of oncogene products, the viral version of the v-H-*ras* as having a single point mutation (it has two of importance, in addition to amino acid 12, also 59 is mutated), and how it is possible, in 1994, to write: 'Although the structure of the cellular proto-oncogene of v-Ki-*ras* is yet unknown, it is highly probable that also in c-Ki-*ras* the amino acid glycine should be encoded in this position' (referring to position 12), is beyond me. The references to these first two chapters, in total 82 and 67, respectively, includes 4 and 1 from 1990 and later, and on page 33, the sentence: 'We only want to note here that, up to 1984, ...', reveaels that indeed, this part of the manuscript was completed a decade ago.

Perhaps 'application of theoretical models using approved methods from quantum theory and solid state physics' does not need the same up-to-date information as does knowledge from the oncogene field, but linking it 'with information on the disturbance of the cell's self-regulation' most certainly does. I doubt that this book supplies the reader with useful ideas, based as they are on outdated information. Those with a genuine interest in understanding the beginnings of cancer in the cells will have to go elsewhere for information.

B. Willumsen

Lectin–Microorganism Interactions; Edited by R.J. Doyle and M. Slifkin, Marcel Dekker Inc.; New York, 1994; viii + 401 pages. $ 165.00. ISBN 0-8247-9112-4.

In 1936, Sumner and Howell reported that concanavalin A, then the only well characterized lectin, agglutinates certain bacteria. This observation remained almost unnoticed until the early 1970's, when a steady flow of publications started to appear on the interaction of lectins, mostly from plants, with a variety of microorganisms, on their application to the study of microbial carbohydrate-containing polymers, and on their potential use as typing reagents for bacteria and viruses. At the same time, the important discovery was made that bacteria by themselves produce lectins, mostly in the form of surface appendages known as fimbriae or pili. These lectins and the key role they play in infectious disease, are discussed in great detail in another recently published book 'Bacterial Adhesion to Cells and Tissues' written by I. Ofek and Doyle (Chapman and Hall, London, 1994).

The publication of the first book devoted solely to lectin–microbial interactions, is most welcome. It has been edited by two veteran researchers in the area, each of whom also contributed one of the ten chapters of the book, a lengthy introduction (by Doyle) and a survey of the applications of lectins in clinical microbiology (by Slifkin). Seven of the other chapters deal with more specialized topics, such as the use of lectins in virology, and the interaction of lectins with medically important yeasts, with *Leishmania* and with trypanosomes. The last chapter is devoted to blood group-specific lectins and their applications. Although not directly related to the main subject of the book, it has been included because of the traditional association between blood bank laboratories and microbial diagnostic laboratories. Between them, the chapters contain a wealth of information documented from a total of over 1,600 references, many unavoidably repetitious. They provide access to techniques the principles of which are often well described in the text. However, very few of the references are to articles published after 1990.

The introductory chapter is particularly interesting, because of the brief survey it gives of lectins (although recent exciting developments on the role of lectins in the migration of leukocytes to sites of inflammation are not mentioned) and of their applications in microbiology. Another helpful feature of this chapter is the appendix, which lists some 350 lectins from diverse sources and their specificities, and provides an update of the list published earlier by Wu et al. (Adv. Exp. Med. Biol. 288, 819–847, 1988).

As made clear throughout the book, lectins are useful tools in microbiology because of their stability and ability to probe subtle differences between carbohydrates in solution and as well as on cell surfaces, often by simple procedures (precipitation, agglutination or light microscopy). Many of them are commercially available, both in their native form and as different derivatives, e.g. for light and electron microscopy and in immobilized form for affinity chromatography. Indeed, lectins have been widely employed in the isolation and characterization of microbial glycoconjugates, and for detection and identification of microbial surface polymers. They can also serve as an aid for discriminating between closely related organisms and thus for diagnostic purposes.

The book might have benefited from more careful editing. This would have weeded out lapses of style, for example, 'lectins capable of agglutinating agglutinated erythrocytes' (p. 143), 'The use of HPA was used' (p. 149), and 'because of the ... lectin definition that limits their specificities to carbohydrates, lectins can now be used only for the detection and study of glycosylated blood group antigens'. (p. 327). Attention should have been paid to incorrect terminology, for instance, neuraminidase (p. 97) for sialidase, 'N-acetylglucose' (p. 113) for N-acetylglucosamine, 'mannosialogangliosides' (p. 310) for monosialogangliosides, 'tagerin' for 'taglin', the trypsin-activated lectin of *Giardia lamblia* (p. 310) and the inconsistent use of the configurational designation of the monosaccharides (D- and L-) as well as their abbreviated names (NeuAc, NeuNAc and Neu-5-Ac for *N*-acetylneuraminic acid). There are also errors of fact, e.g. *Erythrina corallodendron* lectin is not specific for *N*-acetylglucosamine (Table 1, p. 47) but for *N*-acetylgalactosamine, nor are the lectins of *Datura stramonium* (thorn apple or jimson weed) and of *Solanum tuberosum* (potato) specific for β-(1-4) oligomers of *N*-acetylgalactosamine (p. 147), but of *N*-acetylglucosamine.

Like in many books published these days, the index lacks important entries. Thus, there is no mention of organisms such as *Bacillus anthracis* or *Bordetella pertussis* discussed frequently in text, of bacterial fimbriae, and of peanut agglutinin or soybean agglutinin that appear often in the book.

This book will be of interest to lectinologists and microbiologists alike and is especially recommended to laboratories of clinical microbiology that wish to explore the possibilities of introducing lectins as diagnostic tools. Unfortunately, it is rather expensive.

Nathan Sharon

Modern Analytical Ultracentrifugation. Acquisition and Interpretation of Data for Biological and Synthetic Polymer Systems; Edited by T.D. Schuster and T.M. Laue, Birkhauser; Basel, Boston, Berlin, 1994. xii + 360 pages. $ 94.50. ISBN 0-8176-3674-9.

Analytical ultracentrifugation is apparently undergoing a revival due to new equipment, computerisation and sophisticated software. In this book, no less than 42 authors have contributed to 16 chapters. The book is divided in 4 parts covering sedimentation equilibrium, sedimentation velocity, acquisition and data reduction and finally some specific examples.

Part I opens appropriately with a chapter by Hiroshi Fujita, modestly entitled: Notes on the derivation of sedimentation equilibrium equations. The intention is clearly to help understanding the difficult parts of sedimentation equilibrium theory, however the treatment very soon becomes rather sophisicated and sets the style for many of the following chapters. Another chapter gives detailed hints on the analysis

of sedimentation equilibrium experiments. Allen P. Minton presents a new algorithm for the elimination of the reference concentration as an independently variable parameter in the analysis of sedimentation equilibrium. Two other chapters discuss interactions between proteins and of proteins with nucleic acids using experimental data and rather complicated mathematical methods.

Sedimentation velocity experiments are treated in 6 chapters in Part II. Although sedimentation velocity has been used only rarely to study complex mixtures of molecules, here it is shown that much information on molecular interactions can be obtained using modern equipment and desk top computing. Two chapters deal with macromolecular interactions. One describes the use of the apparent sedimentation coefficient distribution function replacing but remotedly related to the less sensitive plot of dc/dr vs r. The other deals with different interaction models. The sensitivities of modern optics are amazing. Schlieren optics requires protein concentrations higher than 1 mg/ml, the interference optical system 0.1 mg/ml and UV scanning not more than a few μg/ml. Comparison between experimental results and simulated results is discussed. Numerical methods for estimation of sedimentation coefficients, diffusion coefficients and hence molecular weights are described, and a chapter is devoted to computer simulation of macromolecular interactions. Waxman and co-workers describe how combination of data from two different techniques can lead to refined information about the shape of macromolecules. In this case, ultracentrifugal techniques are used along with time-resolved fluorescence anisotropy decay measurements, but clearly many other possibilities are obvious.

Acquisition of and reduction of the enormous amount of data collected automatically is an important part of todays ultracentrifugation, but surprisingly part III of this book comprizes only three chapters. One deals very carefully with the Rayleigh optical system recorded using a television camera. Two different approaches are described. Another discusses how to improve graphic programs for this specific purpose, and finally a graphical method for estimation of the ideality of sedimenting boundaries is given.

The last part of this book deals with the use of analytical ultracentrifuges to solve specific problems in biotechnology, drug design and in studies of heterogeneous polysaccharides.

As a whole, this is a fine and concise book. It places the main emphasis on theoretical problems and the use of computers. Unfortunately, in most cases it is not clear how to obtain the programs. It is definitely written by experts for experts and I shall strongly advise newcomers to this area to start with an introductory text before advancing to the present book and to have some handbooks of mathematics at hand while reading it.

Jens Steensgaard

The Metabotropic Glutamate Receptors; Edited by P.J. Conn and J. Patel, Humana Press; Totowa, New Jersey, 1994; x + 277 pages; $ 99.50. ISBN 0-89603-291-4.

The Metabotropic Glutamate Receptors offers a thorough and up-to-date review of all aspects concerning the mGluRs.

The book begins with a chapter discussing cloning, expression, and pharmacology of the various mGluR subtypes. This chapter is followed by two chapters which in more detailed manner describe the agonist and antagonist pharmacology and the second messenger systems coupled to the mGluRs. Although a certain overlap exists between Chapters 1–3, these chapters give an excellent summary of the state-of-the-art in the pharmacology field. It is clear that one of the future focuses will be on the discovery of subtype selective agonists and antagonists by using cloned receptors.

Chapter 4 gives a nice and clear presentation of the anatomical distribution of the mGluRs in the mammalian brain. mRNA of the specific subtypes are detected using in situ hybridation in various brain regions and these data are correlated to data showing phosphoinositol turnover and cAMP formation, as well as to radioligand binding studies and immunocytochemistry. This chapter is very well written with illustrative figures.

Chapters 5–7 describe the involvement of mGluRs in modulation of ion currents and synaptic transmission. This modulation involves activation or inhibition of various K^+ and Ca^{2+} channels and potentiation of AMPA responses and depression of $GABA_A$ responses. The involvement of certain mGluR subtypes in regulation of glutamate release from glutamatergic synapses is discussed, as well as the role of mGluRs in long-term potentiation, long-term depression, and kindling.

In chapter 8 the involvement of mGluR in regulation of neuronal circuits is discussed. The chapter is hard to read and more illustrations would have been helpful. Finally, the last two chapters describe the role of mGluR in both neurotoxicity and neuroprotection as well as the changes in mGluR plasticity in physiological and pathological conditions.

The Metabotropic Glutamate Receptors not only gives a state-of-the-art in the field but also points out the needs for future research and thereby becomes of itnerest to both scientist working with the metabotropic glutamate receptors and with receptors in general.

Charlotte Klitgaard Tygesen
Peter Høngaard Andersen

Vegetables and Vegetable Products. Modern Methods of Plant Analysis; Edited by H.F. Linskens and J.F. Jackson, Spinger-Verlag; Berlin, Heidelberg, New York, 1994; xv + 187 pages. DM 198.00. ISBN 0-387-55843-8.

This hands-on methods volume is one of a series aimed at the applied area of plant biology. As such, the whole series covers basic analysis of the contents of plants and quality control through to down-stream processing and analysis of a wide range of marketable products originating from plant material. It is therefore designed to fill a niche for the need for source works of methods used by workers in agriculture and horticulture, pharmaceuticals and other industries. It therefore contrasts favourably with Academic Press's Methods in Plant Biochemistry series which is more aimed at basic research. Volume 16 describes applied techniques of use in the analysis of vegetables and vegetable products. However, it is not a protocol volume per se and consists of commentaries on available methodologies from which the researcher can develop methods for their particular problem.

The present volume is rather more broad-based than some of the earlier titles in the series in that it deals with a wide range of materials and situations and contains chapters that could have fitted, though perhaps prevented by timing, into any of a number of earlier volumes. The result is less thematic and it is really a collection of potentially useful articles and not an all-encompasing treatise. The authors go some way to dispel these misgivings by giving their rationale for the volume. As it is, they stress the importance and relevance of each chapter often within the socio-economic context. It is refreshing to see a methodology book on plant analysis addressing social problems particularly with respect to dietary intake. Thus the potential for plant-derived proteins and the importance of fibre intake are stressed in the chapters on their analysis. Residue analysis of xenobiotics is also dealt with thoroughly. Aspects of plant breeding are also covered both with respect to the genetics of carotenoid content of fruits and modern methods for the genetic mapping of linkage groups of the pea. The last two chapters discuss analyses relevant to problems encountered with third world crop systems that are aimed at addressing existing efforts to improve nutrition in tropical Africa.

Whether conscious or not a number of chapters are particularly timely. The fibre and antioxidant content of plant products are particularly 'hot topics' at this time. Aspects of dietry fibre are dealt from the point of view of physico-chemical and rheological analysis and