

published on immunoassay validation and, although the subject is discussed briefly by E. W. Weiler in his chapter on plant hormone immunoassays, I feel this aspect should have been given far more prominence. On first reading the chapter titles I expected immunoassay validation to be the main theme of the second chapter on radioimmunoassay and gas chromatography-mass spectrometry of cytokinins. However, no such justification is given to describing GC-MS in this volume and its inclusion remains a mystery to me.

Two omissions from the group of chapters on small-molecule immunology are immunocytochemical localisation and immunoaffinity purification, although both techniques are described for proteins. The immunocytochemical localization of small molecules is an extremely difficult technique and the methods may not yet be well established, but immunoaffinity columns are now being used methods may not yet be well established, but immunoaffinity columns are now being used routinely for the purification of plant hormones, for example, and I am surprised this method was not discussed.

The eight remaining chapters deal with protein antigens such as phytochrome, oat globulins and a range of

enzymes, and provide a comprehensive coverage of techniques, including radioimmunoassay, immunoblotting and immunocytochemistry. This last procedure is particularly well covered and there are descriptions of immunofluorescence detection of cells by light microscopy and the use of the peroxidase antiperoxidase and colloidal gold procedures for examining sub-cellular antigen distribution by electron microscopy.

As with the other volumes in this series the presentation is generally of high quality. Unfortunately, in one chapter two figures have been transposed. Apart from the lack of overall structure commented on above, there is also on unevenness in style and English for which the editors must take responsibility since many of the contributors are non-English speaking. However, these are minor criticisms. I am sure many readers will find this book extremely useful and it is an essential addition to any library catering for plant scientists. The high price will render it less attractive to the individual.

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Plant Growth Substances 1985: edited by M. BOPP, Proceedings of the 12th International Conference on Plant Growth Substances, Springer, Berlin, 1986. 420 pp. DM 118.

This well-produced book opens with a characteristically thoughtful recapitulation, by Professor Wareing, of the conceptual aspects of plant cell responses to growth substances. Following this there are five sections of reportage covering methods, metabolism, mechanisms, effects and applications of plant hormones.

Reflecting the current fashion, the Methods section deals exclusively with immunological techniques. All of the authors are careful to warn of the pitfalls present even with this panacea. Of special interest, Crozier *et al.* and the Monsanto group demonstrate the specificity of immunoaffinity chromatography, a procedure which promises to greatly assist the analysts.

The metabolism section is lead by a review from Phinney *et al.* of the role played by dwarf mutants in the elucidation of the control of shoot elongation in maize by GA₁. Other aspects of metabolism are similarly discussed by a number of predictable, but prestigious, authors. Although not inducive to nail-biting excitement this is how science grows and scientists operate, slowly building on hard facts with hard work.

In the section headed 'Hormones: Mechanism', we find

a surprisingly narrow range of subjects discussed. Out of 14 reports there is one each on membranes, calmodulin, and gene expression. These are followed by two papers on hormone biosynthetic genes encoded in *Agrobacterium tumefaciens* and *T_i* plasmids. The following nine contributions are linked in that they all attempt to elucidate some aspect of auxin transport and the consequences of that transport. These vary somewhat, and range from a discussion of the development of polar transport models from the early days of Went, through membrane carriers, binding sites, and back again to Went. Obviously this is representative of renewed interest in, or perhaps frustration with, one of the earliest studied and, apparently, simplest of hormonal phenomena. Taken together, these reports show the diverse approaches being followed, both technically and conceptually; however, I fear the frustration will be with us for some time to come.

The two final sections dealing with hormonal effects and applications range widely over the subject demonstrating that developmental plant physiology is very much alive and well. Overall the standard of reports is high and the production excellent. These proceedings continue to provide a welcome review and a useful stimulus, and as such deserve a wide circulation.

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