Outstanding Titles from PLENUM

Handbook of Lipid Research
Volume 2
The Fat-Soluble Vitamins
edited by Hector F. DeLuca
University of Wisconsin-Madison
Reviews the mechanisms of absorption, distribution in nature, metabolism, and mechanisms of action of vitamins A, D, E, and K, and their relation to disease. 300 pp., illus., 1978, $33.00/£17.33

Structure and Function of Gonadotropins
edited by Kenneth W. McKerns
University of Florida College of Medicine
This volume delineates the mechanisms of entry of gonadotropins into target cells and examines the means by which they directly regulate metabolism and gene expression in the nucleus. The mechanisms of action of chorionic gonadotropin, lutropin, prolactin, follicle stimulating hormones, and fish—mammalian hybrids in the regulation of the ovary and testis are also covered. A volume in Biochemical Endocrinology. approx. 610 pp., illus., 1978, $59.40/£31.19

The Biology of Aging
edited by John A. Behnke
Editor, BioScience
Caleb E. Finch
University of Southern California, Los Angeles
and Gaithersburg B. Momment
National Institute of Child Health and Human Development and Goucher College
Using a broad cellular and evolutionary framework, the contributors examine aging in terms of its relation to genetics, nutrition, exercise, immune responses, alcohol and drugs, and endocrine functions. 400 pp., illus., 1978, $22.74/£11.94

Enzyme Engineering
edited by Georges B. Broun
Universite de Technologie, Compiegne, France
Georg Manecke
Freie Universitat Berlin, Federal Republic of Germany
and Lemuel B. Wingard, Jr.
University of Pittsburgh
Presenting recent work in the development of technology involved in the immobilization of enzymes, cells, and organelles, these books examine advances in industrial, medical, and analytical problems and applications, as well as current work in affinity chromatography.
Volume 3: 594 pp., 1978, $47.40/£24.89
Volume 4: 512 pp., 1978, $47.40/£24.89

Subcellular Biochemistry
edited by Donald B. Roodyn
University College, London
Presents conventional biochemistry side-by-side with cell biology, genetics, and evolutionary biology to provide a report on some of the most vital work in the rapidly growing field of subcellular biochemistry.
Volume 5: 410 pp., illus., 1978, $45.00/£23.63
Volume 6: approx. 460 pp., illus., 1979, $54.00/£28.35

Immunobiology of Proteins and Peptides—I
edited by M. Z. Atassi
Mayo Medical School and University of Minnesota
and A. B. Stavitsky
Case Western Reserve University
This volume integrates data from studies of different antigens, and examines such topics as antibody synthesis, secretion, affinity, and responses to B cell populations; immune responses to proteins; lymphocyte subsets and membrane markers; soluble helper and suppressor factors; hapten-carrier systems; and amino acid polymers. Advances in Experimental Medicine and Biology, Volume 98, 524 pp., 1978, $54.00/£28.35

Enzymes of Lipid Metabolism
edited by Shimon Gatt
Hebrew University—Hadassah Medical School, Jerusalem, Israel
and Louis Freyaz and Paul Mendel
Louis Pasteur University, Strasbourg, France
While thoroughly covering classical aspects of enzyme studies—isoenzyme, purification, and specificity—this book examines the problems of interact- ing enzymes and lipid substrates, including effects of detergents and activators, biosynthesis of lung surfactant, and enzymatic aspects of lipid storage disease. Advances in Experimental Medicine and Biology, Volume 101, 806 pp., 1978, $71.40/£37.49

Nutritional Improvement of Food and Feed Proteins
edited by Mendel Friedman
U.S. Department of Agriculture
This volume brings together outstanding international scientists who critically assess methods for measuring protein malnutrition, and ways of improving the quality, quantity, and nutritional availability of foods and feeds. Advances in Experimental Medicine and Biology, Volume 105, 896 pp., 1978, $83.40/£43.79

227 West 17th Street, New York, N.Y. 10011
In United Kingdom: Black Arrow House, 2 Chandos Road, London NW10 6NR, England
Described below are just two examples of the many up-to-date techniques, which have been pioneered or applied for routine use at The Radiochemical Centre. These developments are part of our constant endeavour to maintain our position at the forefront of the specialised field of tracer methodology, so that we can continue our supply of radiochemicals of the highest quality and technical specifications.

Distribution of labelling in tritium compounds

Modern techniques for the production of tritiated compounds are more sophisticated than those used in the early days of tritium labelling, and produce compounds labelled in specific positions rather than generally labelled. Nevertheless, it is necessary for many tracer applications of tritium compounds to know the precise position and configuration of the tritium labels. Traditional chemical methods of doing this are tedious and time consuming and subject to considerable error, and so the routine supply of such information has until recently not been possible.

The Radiochemical Centre, in collaboration with the University of Surrey, has developed over the past eight years the technique of tritium nuclear magnetic resonance (tmmr) spectroscopy for this purpose. This method is much quicker and more accurate than the traditional chemical or biochemical methods for determining distribution of tritium labelling.

It is now used routinely to establish the distribution of tritium labelling produced by the usual methods of tritiation employed at The Radiochemical Centre. We supply accurate details as to the position and configuration of the tritium labels for an increasing number of our labelled compounds.

High performance liquid chromatography (HPLC)

This relatively new development of column chromatography is carried out using high efficiency microparticulate column packings of closely defined size. Chromatography is carried out under pressure to ensure good flow rates and reduce diffusion of separated compounds. Dead volumes are kept to an absolute minimum. The result is that many separations can be carried out more quickly and with better resolution than with previously used chromatographic methods such as thin-layer chromatography or conventional column chromatography.

Work aimed at developing the applications of this method to radiolabelled compound separations is still in progress, but the Radiochemical Centre is already using the technique in many of its production processes, and in analytical applications. The result is purer compounds for the customer and greater efficiency of working.

The example illustrated below illustrates the clear superiority of HPLC when used as an analytical tool. The mixture used comprised the tritium labelled monophosphates of adenosine, cytidine, guanosine and uridine, and all are clearly separated in the HPLC system.

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**Labelled compounds you can trust**

The Radiochemical Centre Amersham


In the Americas: Amersham Corporation, Illinois 60065, Tel: 312 593 6300.

In West Germany: Amersham Buchler GmbH & Co., K.G., Braunschweig. Tel: 05383 4693 97.
Nocodazole [methyl [5-(2-thienylcarbonyl)-1H-benzimidazol-2-yl]carbamate, R17934] is a new synthetic microtubule inhibitor, chemically unrelated to the microtubule-disintegrating alkaloids colchicine, the vinca alkaloids, rotenone, and podophyllotoxin. Investigation into the mechanism of its activity against experimental neoplasms \(^2\) revealed that the compound exhibited highly specific antimitotubular activity, inducing the total disappearance of microtubules from neoplastic cells in vivo \(^3\) and from mammalian cells in culture. \(^4\) This activity and the ensuing cell-biological effects were identical to those produced by the antimicrotubular alkaloids. Effects include:  
1) loss of directional cell movement \(^4\)  
2) alteration of cell shape \(^4\)  
3) loss of ordered subcellular organelle movements \(^4\)  
4) randomization of subcellular organelle topography \(^2\) \(^4\) \(^5\)  
5) inhibition of insulin secretion \(^6\)  
6) induction of Con-A cap formation on human polymorphonuclear leukocytes  
7) appearance of bundles of 10nm-filaments and annulate lamellae \(^3\) \(^4\) \(^8\) \(^9\)  
9) destruction of the mitotic spindle with ensuing mitotic block \(^3\) \(^4\) \(^10\)  

The high degree of specificity was demonstrated by the absence of nonspecific side effects unrelated to its antimicrotubular properties. \(^4\) \(^4\) The cell-biological effects were identical within a large dose range (0.04-100μg/ml), and concentrations that had no effect on microtubules (<0.01 μg/ml) showed no effects whatsoever on cellular structure, behavior, growth or viability. \(^4\) The antimicrotubular activity in tissue-cultured cells was almost immediately visible and reversible.  

Subsequently, it was shown that Nocodazole inhibited the polymerization of tubulin in vitro in a dose-dependent way and that it shared the same binding site on the tubulin molecule with colchicine. \(^11\) In contrast to colchicine, however, Nocodazole is easily removed from its binding site. \(^11\)  

Comparison of its effects with those of colchicine should help establish the involvement of tubulin and microtubules in the studied phenomena. Colchicine-induced alterations unrelated to interaction with tubulin have indeed been reported. \(^2\) \(^3\) The rapid penetration of Nocodazole and the lack of irreversible binding should facilitate short-term experiments, especially when phenomena related to the reappearance of microtubules are studied. The reversibility of its action can also be favorably exploited when cell synchronization is attempted through a reversible mitotic block.  

A number of organisms that are relatively resistant to the action of colchicine could prove sensitive to Nocodazole. Preliminary data indicates, for instance, that Nocodazole shows antimicrotubular effects in fungi. \(^14\)  

The compound is stable in biological media for at least 7 days.  

Thus, the availability of a synthetic compound with a simple chemical structure unrelated to the plant alkaloids and with a specific antimicrotubular activity is potentially useful in the field of microtubule research.  

References:

19,429-8 Nocodazole 10mg $9.90; 50mg $34.85