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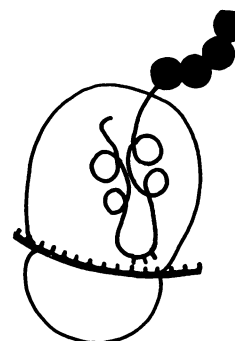
# GENE EXPRESSION

## — Regulation at the RNA and Protein Levels

Edited by J. Kay, F.J. Ballard and R.J. Mayer

204 pp. ISBN 0 904498 24 7 Price £35 (US \$65) BIOCHEMICAL SOCIETY SYMPOSIUM NO. 55

List of contents and authors: *Gene Expression and Differentiation in F9 Mouse Embryonal Carcinoma* by Merilyn J. Sleigh; *Regulation of Genes Associated with Drug Metabolism* by William H. Elliott, Brian K. May, Michael J. Bawden & Antony J. Hansen; *Cloning and Expression of the Genes for Calpains and Calpastatins* by Takashi Murachi, Emiko Takano, Masatoshi Maki, Yoshifumi Adachi & Masakazu Hatanaka; *Peptide Signals for Protein Degradation within Lysosomes* by J. Fred Dice & Hui-Ling Chiang; *Haemopoietic Growth Factor Control of Normal and Neoplastic Cellular Proliferation* by Antony W. Burgess, Jonathan Cebon & Sandra Smith; *Nuclear Pre-mRNA Splicing in Saccharomyces cerevisiae* by Jean Beggs, Marie Lossky & Gordon J. Anderson; *Control of mRNA Stability During Development of Dictyostelium discoideum* by Giorgio Mangiarotti; *Effects of Insulin-Like Growth Factors on Protein Metabolism: Why are some Molecular Variants more Potent?* by F. John Ballard, Geoffrey L. Francis, Christopher J. Bagley, Laszlo Szabo & J. C. Wallace; *Hormonal Regulation of Gene Expression* by John W. Funder; *Mechanisms by which Prolactin and Glucocorticoids Regulate Casein Gene Expression* by Jeffrey M. Rosen, Patrick Poyet, Heather Goodman & Kuo-Fen Lee; *Processing of the Polymeric Immunoglobulin Receptor* by Roberto Solari, Esther Schaefer, Corinne Tallichet, Liliane Racine & Jean-Pierre Kraehenbuhl; *Experimental Characterization of the Autophagic-Lysosomal Pathway in Isolated Rat Hepatocytes* by Paul B. Gordon, Gunn Ø. Kisen, Attila L. Kovacs & Per O. Seglen; *The Molecular Chaperone Concept* by R. John Ellis, Saskia M. Van Der Vies & Sean M. Hemmingsen; *Protein Folding and Intracellular Transport: Studies on Influenza Virus Haemagglutinin* by Mary-Jane Gething & Joe Sambrook; *Role of Protein Disulphide-Isomerase in the Expression of Native Proteins* by Robert B. Freedman, Neil J. Bulleid, Hilary C. Hawkins & Jan. L. Paver; *Intermediate Filament-Ubiquitin Diseases: Implications for Cell Sanitization* by R. John Mayer, James Lowe, Graham Lennox, Michael Landon, Ken MacLennan & Fergus J. Doherty; Subject index.



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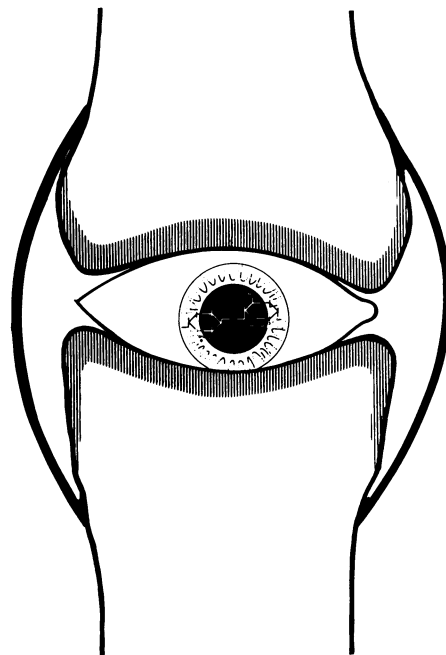
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# KERATAN SULPHATE

Chemistry, Biology,  
Chemical Pathology

Edited by

HELMUT GREILING  
&  
JOHN E. SCOTT



Keratan sulphate is unique, standing at a crossroads, sharing the potential of both typical glycoproteins and typical proteoglycans. In one direction lie immunology, cell development and oncogenesis; in the other, important roles in the ultrastructure and function of cornea, joints and intervertebral discs. This book, the first in the field, is the fruit of the first full international symposium on keratan sulphate. The challenge of new viewpoints produced controversy, but also much common ground; this is revealed by the edited discussions, grouped for continuity, which follow the main sections. The bibliography is collected into one section, providing much of the literature on keratan sulphate in one place.

**Contents:** **PART I - CHEMISTRY:** Structure of keratan sulphate proteoglycans: core proteins, linkage regions, carbohydrate chains (*Stuhlsatz, Keller, Becker, Oeben, Lennarts, Fisher & Greiling*); Structural and conformational analysis of keratan sulphate oligosaccharides and related carbohydrate structures (*Hounsell*); Discussion. **PART II - IMMUNOLOGY:** Keratan sulphate oligosaccharides, members of a family of antigens of the poly-N-acetyl-lactosamine series (*Feizi*); Studies of keratan sulphates of aorta and cartilage utilizing MAb 6D2 (*Baker*); Detection and purification of corneal keratan sulphate proteoglycan from non-corneal tissues (*Funderburgh & Conrad*); Discussion. **PART III - BIOSYNTHESIS:** Biosynthesis of skeletal and corneal keratan sulphate (*Balduini, De Luca & Castellani*); Keratan sulphate proteoglycans: chemistry and biosynthesis of the linkage regions (*Hascall & Kimura*); Discussion. **PART IV - REGULATION OF BIOSYNTHESIS:** Factors affecting the pathway for the biosynthesis of keratan sulphate (*Mason & Sweeney*); Sulphation, chain elongation and chain termination in keratan sulphate biosynthesis (*Keller, Stuhlsatz & Greiling*); Keratan sulphate: a functional substitute for chondroitin sulphate in O<sub>2</sub>-deficient tissues? (*Scott, Stockwell, Balduini & De Luca*); Discussion. **PART V - DEGRADATION:** Substrate specificity of keratan sulphate-degrading enzymes (endo- $\beta$ -galactosidase, keratanase and keratanase II) from micro-organisms (*Nakazawa, Ito, Yamagata & Suzuki*); Degradation of keratan sulphate proteoglycans (*Kresse*); Discussion. **PART VI - KERATAN SULPHATE IN THE TISSUES:** The chemical morphology of keratan sulphate proteoglycans (*Scott*); Articular cartilage keratan sulphate: maturation, ageing, biomechanical and scale effects (*Stockwell*); Proteoglycans of mammalian corneal stroma (*Damle & Gregory*); Discussion; Developmental aspects of keratan sulphate (*Cintron, Covington, Kublin, Gregory & Damle*); Keratan sulphate proteoglycans in organ and cell culture (*Dahl*); Discussion. **PART VII - CHEMICAL PATHOLOGY:** Studies of the metabolism of keratan-sulphate-bearing proteoglycans of cartilage (*Thonar, Williams, Sweet, Maldonado, Lenz, Schnitzer & Kuettner*); Serum keratan sulphate in rheumatoid arthritis and different clinical subsets of osteoarthritis (*Seibel, Towbin, Braun, Kiefer, Müller & Paulsson*); Factors affecting the determination of keratan sulphate using monoclonal antibodies in immunoassay procedures (*Caterson, Brooks, Sattangi, Ratcliffe, Hardingham & Muir*); Discussion; Alterations in the synthesis of keratan sulphate proteoglycan in corneal wound-healing and in macular corneal dystrophy (*Hassell, SundarRaj, Cintron, Midura & Hascall*); Distribution of keratan sulphate-containing proteoglycans in human aorta and their possible role in the calcification of aorta (*Greiling, Loffler & Stuhlsatz*); Discussion. *Bibliography. Index.*

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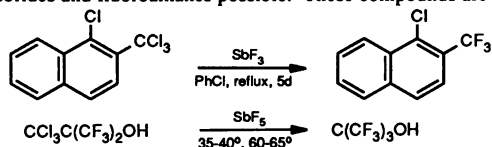
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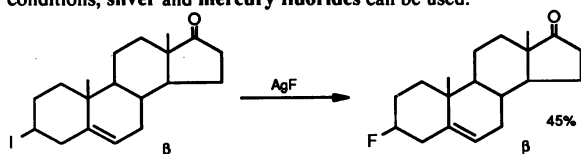
# Reagents for Fluorination

Aldrich offers the world's largest range of fluorine-containing products. In addition, we offer many reagents for introducing fluorine into molecules, most of which can be handled safely and easily in standard laboratory glassware. There are four general classes of fluorination reactions, and Aldrich offers reagents suitable for use in each class.<sup>1</sup>

**1. Halogen exchange** is perhaps the best known method for introduction of fluorine into organic compounds. Pioneering work by Swarts using antimony fluorides made the early preparation of benzo-trifluorides and fluoroalkanes possible. These compounds are more



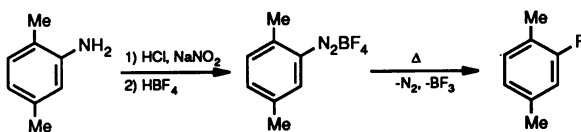
commonly prepared now using large-scale batch or continuous processes employing HF. In small-scale reactions needing much milder conditions, silver and mercury fluorides can be used.



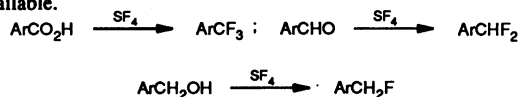
Potassium fluoride offers a readily available source of fluoride ion and is used extensively in so-called 'Halex' reactions to produce good yields of highly fluorinated products. The desire to obtain better yields under milder conditions has resulted in the development of a number of new reagents such as TBAF, KF/CaF<sub>2</sub> and TAS-F.<sup>2</sup>

A new and easy-to-handle source of nucleophilic fluoride ion is triethylamine trihydrofluoride (Et<sub>3</sub>N·3HF). The versatility of this reagent has been demonstrated in halofluorination reactions of alkenes,<sup>3</sup> quantitative opening of epoxides to fluoroalcohols<sup>4</sup> and the fluoride substitution of activated alcohols.

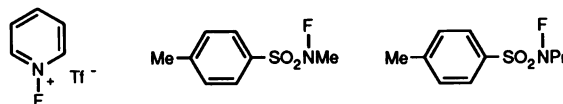
**2. Balz-Schiemann** reactions are the classical method for introducing fluorine to an aryl nucleus. An arylamine is converted to a diazonium tetrafluoroborate and then decomposed thermally to the aryl fluoride. Improved yields have been reported in some cases using arenediazonium hexafluoroantimonate or hexafluorophosphate intermediates or by photolytic decomposition of the tetrafluoroborate salt.



**3. Sulfur tetrafluoride and analogs** have been used extensively for the conversion of oxygen-containing functional groups to fluorinated substituents. Sulfur tetrafluoride itself presents handling and toxicity problems and replacements are continually being sought. Perhaps the best known is diethylaminosulfur trifluoride (DAST)<sup>2</sup> which can be used to convert -CHO to -CHF<sub>2</sub> and -CH<sub>2</sub>OH to -CH<sub>2</sub>F. Recently, morpholinosulfur trifluoride<sup>5</sup> has been reported as a safer alternative to DAST. Other aminosulfur trifluorides are also available.



**4. Electrophilic fluorinating agents** have been developed as alternatives to elemental fluorine for the selective introduction of fluorine into biologically active molecules. *N*-Fluoropyridinium triflates and *N*-fluorosulfonamides offer varying fluorination strength by altering the substitution on the molecule.



## References:

- 1) For a more detailed discussion, see Hewitt, C.D.; Silvester, M.J. *Aldrichim. Acta* 1988, 21(1), 3.
- 2) For references, see *Aldrichim. Acta* 1988, 21(1), 27.
- 3) Alvermhe, G.; Laurent, A.; Haufe, G. *Synthesis* 1987, 6, 562.
- 4) *Idem J. Fluorine Chem.* 1986, 34, 147.
- 5) For references, see *Aldrichim. Acta* 1988, 21(4), 109.

17,512-9	Antimony pentafluoride	100g \$128.80
20,111-1	Antimony trifluoride, 98%	5g \$10.00; 100g \$21.10 500g \$72.00
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20,092-1	Silver difluoride, 98+%	10g \$49.80; 50g \$184.00
22,686-6	Silver(I) fluoride, 99%	5g \$27.10; 25g \$100.80
24,151-2	Tetrabutylammonium fluoride hydrate, 98% (TBAF)	10g \$18.40; 100g \$125.10
34,464-8	Triethylamine trihydrofluoride, 98%	5g \$7.00 25g \$22.00
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