Journal of Fluorine Chemistry 143 (2012) 10

Contents lists available at SciVerse ScienceDirect

Journal of Fluorine Chemistry

journal homepage: www.elsevier.com/locate/fluor

Editorial

This issue honors the 2012 winner of the ACS Award for Creative Work in Fluorine Chemistry, Professor David O'Hagan, and the contributions he has made to the field of Bio-organic Fluorine Chemistry. Many of the papers included in this special issue are from the laboratories of the invited lecturers who participated in a special award symposium.

David O'Hagan was born in Glasgow in 1961 and studied chemistry at the University of Glasgow (1982). Chemistry at Glasgow had a good tradition of natural products chemistry and biosynthesis and he carried out an undergraduate research project with Professor Karl H. Overton on the mechanism of a bacterial amino mutase enzyme. This was his first involvement in enzyme research. He moved to the University of Southampton to carry out a Ph.D. (1985) under Professor John A. Robinson (now University of Zurich) where he was involved in biosynthesis and enzyme studies of tylosin and monensin-A, two polyketide antibiotics from *Streptomyces* bacteria. He spent a postdoctoral year at the Ohio State University with Professor Heinz G. Floss, carrying out further antibiotic biosynthesis studies this time on the modified peptide antibiotic thiostrepton.

In 1986 he was appointed to the University of Durham as a Senior Demonstrator. Senior Demonstrators had teaching responsibilities but independent research was strongly encouraged, generally supported by senior colleagues. It was at this time that he established a strong interest in organo-fluorine chemistry, influenced by Professor Dick Chambers FRS, who encouraged him to consider exploring research in bioorganic aspects using fluorine. Together they carried out investigations into the structure of CF_2-phosphonates and explored the enzymology of the CF_2-phosphonate analogue of glycerol-3-phosphate. Two years later in 1988 he was made Lecturer at Durham, and also began to develop a broader research programme into the biosynthesis of a range of bacterial and fungal polyketides and plant alkaloids and terpene natural products. He also began to explore the very rare organo-fluorine natural products and in particular the biosynthesis of fluoroacetate and 4-fluorotheronine from *Streptomyces cattleya*. Metabolism studies with isotope labels were used to pin down the metabolic pathway to these metabolites. This was assisted by a very productive collaboration with Professor David Harper a microbiologist, and Dr Jack Hamilton a mass spectrometrist, both at the Queen's University of Belfast.

He remained at Durham until 2000 before moving to his current position as Professor and Head of Organic Chemistry at the University of St Andrews. In 2002 the fluorinase enzyme was identified and purified. This is the enzyme involved in the first step in fluorometabolite biosynthesis in *S. cattleya*, and remains the only biosynthetic fluorination enzyme to have been identified. Over the last decade the enzyme has been characterised at the genetic and structural levels in important collaborations with Dr Jonathan Spencer at Cambridge University and Prof Jim Naismith at St Andrews University. His research group is focussed on developing bio-technological aspects of the fluorinase.

In a collaboration with Professor Bradley Moore at the Scripps Institution of Oceanography, the fluorinase gene was cloned into a marine microorganism (*Salinispora tropica*) which resulted in the organism being able to produce a novel fluorinated metabolite (a fluoro salinosporamide) by genetic engineering. His research group is also exploring the fluorinase as a catalyst for fluorine-18 isotope incorporation for positron emission tomography (PET). The PET work is carried out in collaboration with radiochemistry laboratories and particularly with Prof Matteo Zanda at the University of Aberdeen at their cyclotron and clinical radiochemistry facility. Alongside the fluorinase enzyme research, his group are exploring the consequences of introducing C–F and CF_2 into organic motifs and into bioactive molecules such as neurotransmitters (e.g. GABA) to influence conformation by exploiting stereoelectronic effects. They also have a programme focussed on the assembly of vicinal fluoromethylene motifs where alkane chains are constructed carrying runs of adjacent fluorine atoms with defined stereochemistry. Such compounds represent novel motifs which are being explored as future motifs for liquid crystal applications.

He was a founding member and a past Chairman of the Royal Society of Chemistry, Fluorine Subject Group. He was awarded the RSC Malcolm Campbell Memorial Prize in Medicinal Chemistry in 2005, was a recipient of the RSC Tilden Medal in 2006/2007 and was awarded the RSC *Natural Product Reports* Lectureship in 2009. He has edited two themed issues (2008 and 2010) in Fluorine Chemistry for the *Beilstein Journal of Organic Chemistry*.

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0022-1139/$ – see front matter © 2012 Elsevier B.V. All rights reserved.
http://dx.doi.org/10.1016/j.jfluchem.2012.07.013