

Professor David O'Hagan Head of Organic Chemistry

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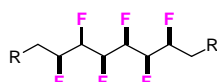
tel: 01334 467176



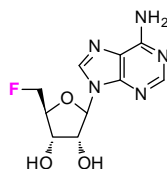
Research Interests: organic chemistry, organo-fluorine chemistry, biological chemistry, natural products, biotransformations, enzyme mechanism, biosynthesis.

Our research has a strong focus on organo-fluorine chemistry, and particularly organo-fluorine chemistry focused on bio-organic and chemical biology research. We are interested in the influence of the fluorine atom on the conformation and behaviour of biomolecules. We also have a strong interest in enzymatic fluorination (the fluorinase) and how that can be applied to biotechnological solutions, through molecular biology, towards the production of organisms that can produce organo-fluorine compounds by fermentation (eg. antibiotics). We have a strong interest in synthetic organic chemistry and we are focussing on the synthesis of new motifs in organo-fluorine chemistry which can be used in a variety of performance molecules.

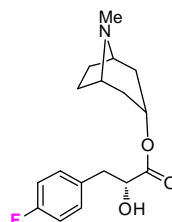
These research areas require that the research group has activities in organic synthesis, fluorine chemistry, protein chemistry and molecular biology. Some of the molecules we have explored recently are shown below.



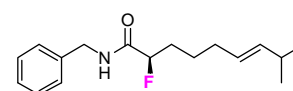
six -fluorines adjacent to each other



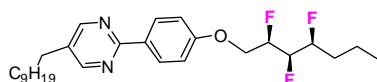
fluoro-deoxyadenosine.
The product of the fluorinase enzyme reaction



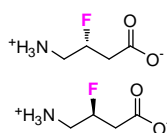
fluoro tropine alkaloid



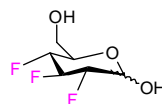
fluorocapsaicin a potential analgesic



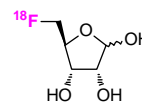
ferroelectric liquid crystal



3-fluoro-GABA enantiomers neurotransmitter analogue



D-glucose analogue containing three fluorines in place of OH's
(*Chem. Commun.*, 2010, 5434)



F-18 labelled ribose for positron emission tomography (PET) imaging studies

SELECTED RECENT PUBLICATIONS

1. L. Hunter, P. Kirsch, A. M. Z. Slawin, D. O'Hagan, , Synthesis and structure of a multivincinal hexafluoroalkane stereoisomers' *Angew. Chemie. Int. Ed.*, 2009, **48**, 5457.
2. D. Farran, A. M. Z. Slawin, P. Kirsch, D. O'Hagan, 'Diastereoselective synthesis of multivincinal 2,3,4,5,6-pentafluoroheptanes' *J. Org. Chem.*, 2009, **74**, 7168.
3. M. Onega, J. Domarkas, H. Deng, L. F. Schweiger, T. A. D. Smith, A. E. Welch, C. Plisson, A. D. Gee, D. O'Hagan. 'An enzymatic route to 5-deoxy-5-[¹⁸F]-fluoro-D-ribose, a [¹⁸F]-fluorinated sugar for PET imaging' *Chem. Commun.*, 2010, 139.
4. A. S. Eustáquio, D. O'Hagan, B. S. Moore, 'Engineering fluorometabolite production: Fluorinase expression in *Salinispora tropica* yields fluorosalinosporamide' *J. Nat. Prod.*, 2010, **73**, 378.
5. J. W. Schmidberger, A. B. James, R. Edwards, J. H. Naismith, D. O'Hagan 'Halomethane biosynthesis: Structure of a SAM-dependent halide methyltransferase from *Arabidopsis thaliana*,' *Angew. Chemie. Int. Ed.*, 2010, **49**, 3646.