Postdoctoral Research Associate in Synthetic Organic Chemistry

Department of Chemistry

Closing date: 4 February 2018
Interview date: 27 February 2018
Vacancy reference: 6274
INTRODUCTION

A Postdoctoral Research Associate position in synthetic organic chemistry to work with Dr Will Unsworth and Prof Richard Taylor in the Department of Chemistry, University of York is available for 36 months from 1 April 2018 or as soon as possible thereafter. Funded by the EPSRC (UK Engineering and Physical Sciences Research Council), the project involves the development of novel methods to synthesise functionalised spirocycles. You will join a team led by Dr Will Unsworth and co-supervised by Prof Richard Taylor, and in addition to research responsibilities, you will be expected to assist with the supervision of more junior group members.

The position will suit a person with experience in synthetic organic chemistry, especially with a background in the development of new synthetic methods and the synthesis and characterisation of complex molecules. Experience in related areas, especially catalysis, dearomatisation reaction and/or spirocycle synthesis, is desirable, but above all, the ability to show creativity in the design and implementation of new synthetic ideas is a key requirement of this post.

The Department of Chemistry is one of the UK’s leading Chemistry departments and we are renowned internationally for our research. This is combined with a commitment to teaching and outstanding student satisfaction, and we have been recognised consistently for our family-friendly policies and are proud of our Athena SWAN Gold Award: https://www.york.ac.uk/chemistry/ed/

As a Department we strive to provide a working environment which allows all staff and students to contribute fully, to flourish, and to excel. We aim to ensure that there is a supportive and egalitarian culture at all levels and across all staff groups. We promote good practice and a strong culture of equality in higher education. Further information can be found within this brief and on our website: www.york.ac.uk/chemistry/
Spiroclip Technology: from Catalogue to Spirocycle in One Step

To meet burgeoning worldwide healthcare and food-security demands, rapid access to diverse organic compounds is crucial, both in the pharmaceutical and agrochemical industries. However, there is a growing acknowledgement that the traditional synthetic approaches that underpin these industries are limited in terms of the range of 3D-structures that they typically generate, negatively impacting discovery programmes, and hence there is much current interest in the investigation of molecules which cover much wider regions of chemical space. Existing approaches to such 3D architectures are often time-consuming and labour-intensive, with these problems particularly acute for the synthesis of spirocycles, which have been identified as important but under-exploited scaffolds. The major goal of this project is to make the synthesis of spirocycles easier.

Typical dearomatising spirocyclisation approaches (including those in our earlier work) involve the preparation of a mono-substituted aromatic precursor, which then undergoes spriocyclisation upon activation with a suitable catalyst. However, a drawback to this approach is that synthesising the starting material synthesis is often not trivial, and in many cases, this can serve as a barrier to the uptake of the method. A major goal of the research proposed herein is to remove this barrier, by developing a new family of bifunctional reagents (Spiroclip reagents) capable of functionalising the parent aromatic/heteroaromatic AND promoting spirocyclisation, thus enabling us to prepare complex spirocycles from catalogue aromatics/heteroaromatics in a single step. If successful, this approach will likely be of high value to academic and industrial chemists involved in the preparation of bioactive spirocycles, and to researchers in applied fields that rely on the efficient synthesis of diverse organic compounds.


Candidates who are short-listed for interview should be familiar with the research in the Unsworth and Taylor groups and be ready to discuss the papers listed above.

Main purpose of the role

- To conduct research into the development and application of new spirocyclisation methods and reagents, and to contribute to the production of research outputs relating to this
- To assist in the identification and development of potential areas of research and the development of proposals for independent or collaborative research projects

Key responsibilities

(Role holders will be required to undertake some or all of the duties below)

- To conduct individual and collaborative research projects, duties to include:
  - Analysis and interpretation of research data
  - Use of appropriate research techniques and methods
  - Writing up of research results and dissemination through publications (in high-profile English-language scientific journals), seminar and conference presentations and public engagement and outreach activities
  - Keeping up to date with relevant published literature and sharing information with group members
  - Contributing to the identification of possible new areas of research
- To contribute to the preparation of research proposals and applications to external bodies
To develop and initiate collaborative working internally and externally, duties to include: the building of internal contacts and participation in internal networks; collaboration with colleagues on joint projects as required; participation in and identification of external networks in order to share information and identify potential opportunities for collaboration and possible sources of funding; attendance at and contribution to relevant meetings including group meetings, meetings with collaborators and representing the group at national and international conferences.

To provide guidance to other staff and students, as required, as well as coordinating the work of small research teams. This will include working closely with PhD students, Masters and undergraduate level project students contributing to their training and scientific development.

To participate in, and contribute to, a supportive and egalitarian working culture.

The above list of duties is not exhaustive and is subject to change. The post holder may be required to undertake other duties within the scope and grading of the post.
# PERSON SPECIFICATION

## Qualifications

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<tr>
<th>Qualifications</th>
<th>Essential/Desirable</th>
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<tbody>
<tr>
<td>First degree in Chemistry or a related Chemistry-based degree (e.g. Natural Sciences)</td>
<td>Essential</td>
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<td>PhD in synthetic organic chemistry or equivalent experience</td>
<td>Essential</td>
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## Knowledge

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<th>Knowledge</th>
<th>Essential/Desirable</th>
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<tr>
<td>Knowledge in synthetic organic chemistry to engage in high quality research</td>
<td>Essential</td>
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<td>Knowledge and experience of a range of research techniques and methodologies (e.g. organic synthesis, chromatography, spectroscopy)</td>
<td>Essential</td>
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<td>Has research expertise in an area that will complement and enhance the department’s and the Unsworth/Taylor groups’ research strategy and goals</td>
<td>Essential</td>
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<td>An understanding of the operation of a research laboratory and an awareness of health and safety issues</td>
<td>Essential</td>
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<tr>
<td>Knowledge of one or more of the following areas: Dearomatisation reactions, spirocycle synthesis, catalysis</td>
<td>Desirable</td>
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<td>Knowledge of the research carried out in the Unsworth and Taylor groups</td>
<td>Desirable</td>
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## Skills, abilities and competencies

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<tr>
<th>Skills, abilities and competencies</th>
<th>Essential/Desirable</th>
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<tbody>
<tr>
<td>Ability to perform multi-step organic synthesis</td>
<td>Essential</td>
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<td>Ability to perform purification and spectroscopic assignment of organic molecules</td>
<td>Essential</td>
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<td>Highly developed communication skills to engage effectively with a wide ranging audience, both orally and in writing, using a range of media</td>
<td>Essential</td>
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<td>Ability to write up research work for publication in high profile journals and engage in public dissemination</td>
<td>Essential</td>
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<td>Ability to develop research objectives, projects and proposals for own and joint research, with the assistance of a mentor if required</td>
<td>Essential</td>
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<td>Competency to conduct individual and collaborative research projects</td>
<td>Essential</td>
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<td>Ability to plan and prioritise own work in order to meet deadlines, including using initiative to plan research programmes</td>
<td>Essential</td>
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<td>Ability to work as part of a team and also to work independently using own initiative</td>
<td>Essential</td>
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<tr>
<td>Ability to identify sources of funding and contribute to the process of securing funds, with collaborators if required</td>
<td>Desirable</td>
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## PERSON SPECIFICATION

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<th>Experience</th>
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<tr>
<td>Experience of carrying out research in synthetic organic chemistry (e.g. methodology development, target synthesis, chromatography)</td>
<td>Essential</td>
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<td>Experience of collecting, interpreting, analysing and writing up the spectral data of complex molecules, especially using NMR spectroscopy</td>
<td>Essential</td>
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<tr>
<td>Ability to work as part of a team and also to work independently using own initiative</td>
<td>Essential</td>
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<tr>
<td>Experience of carrying out both independent and collaborative research</td>
<td>Desirable</td>
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<td>Experience of supervising project students</td>
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<td>Experience of teaching organic chemistry to undergraduates</td>
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<td>Experience of writing up research work for publication</td>
<td>Desirable</td>
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<th>Personal attributes</th>
<th>Essential</th>
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<tr>
<td>Attention to detail and commitment to high quality</td>
<td>Essential</td>
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<td>Collaborative ethos</td>
<td>Essential</td>
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<td>Interest in and enthusiasm for the subject matter of the project(s)</td>
<td>Essential</td>
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<td>Positive attitude to colleagues and students</td>
<td>Essential</td>
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<td>Willingness to work proactively with colleagues in other work areas/institutions</td>
<td>Essential</td>
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<tr>
<td>Strong work ethic and ability to plan and prioritise own work in order to meet deadlines, including using initiative to plan research programmes</td>
<td>Essential</td>
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<td>Commitment to personal development and updating of knowledge and skills</td>
<td>Essential</td>
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THE DEPARTMENT

The post-holder will join a team led by Dr Will Unsworth to investigate novel methods to develop new methods and reagents for the synthesis of spirocycles.

For further information on the Unsworth group, see: https://www.york.ac.uk/chemistry/staff/academic/t-z/wunsworth/

The Taylor Research Group

This project is in collaboration with co-investigator Prof Richard Taylor. The candidate will be expected to work closely with both supervisors and their groups.

For further information on the Taylor group, see: https://www.york.ac.uk/chemistry/staff/academic/t-z/rtaylor/grouppages/

The Department of Chemistry

The Department of Chemistry: http://www.york.ac.uk/chemistry is one of the largest and most successful academic departments at York. The Department was placed in the top ten UK universities for Research Power by the 2014 Research Excellence Framework exercise (REF). Amongst our academic staff we have five Fellows of the Royal Society and many national and international prize winners, contributing to a dynamic and thriving department. The excellence of Chemistry at York was recognised in the 2018 Guardian League Table Guide, Complete University Guide and Times University League Tables where it achieved an outstanding 2nd and two 4th places, respectively.

The Department has nearly 60 academic staff (including teaching-only staff), more than 600 undergraduate students, approximately 160 graduate students (mainly studying for PhDs) and over 80 research associates and fellows. The Department has a group of coherent laboratories, recently extended and modernised, which provide an excellent environment for both teaching and research; £35M has been spent on new buildings and equipment in the last seven years.

Staff in the Department of Chemistry undertake research in a wide range of fields and there are particular strengths in analytical and archaeological science, atmospheric chemistry, chemical and structural biology, green chemistry, materials chemistry, metalloproteins, organometallic and catalytic chemistry, synthetic organic chemistry and time-resolved spectroscopy.

We have nearly 30 administrative staff (including those funded externally), as well as over 50 technical staff who provide assistance in the teaching and research laboratories and maintain the workshops (mechanical, glass and electronics) supporting these activities.

The undergraduate programmes, which typically attract over 1200 applications for the ca 180 places, have a flexible, modular structure with opportunities for specialisation in environmental, industrial and medicinal chemistry. There are three-year (BSc) and four-year (MChem) courses with opportunities for students to spend a year at one of a number of overseas universities or in industry.

The Gold award from Athena SWAN: https://www.york.ac.uk/chemistry/ed/ for promoting women in science was won by the Department of Chemistry in 2007 and renewed in 2010.
and 2015. This was the first Gold award made in this scheme. The Athena SWAN Charter recognises and celebrates good employment practice for women working in science, engineering and technology (SET) in higher education and research.

The case studies on our Equality and Diversity website: https://www.york.ac.uk/chemistry/ed/fam-friendly-work/ illustrate the variety of working arrangements of staff which are supported by the Department.

The Department of Chemistry operates a set of family-friendly practices. Staff working patterns are flexible and a formal Flexitime system is also in operation. The Department has developed a maternity and paternity leave procedure to help provide support for staff and the University has a nursery http://www.york.ac.uk/univ/nrsry/ and a Child Care voucher scheme.

The Department provides support for all categories of staff in their applications for promotion, role reviews, awards, prizes and rewarding excellence nominations. Staff are encouraged to attend training events and take up opportunities for professional development including those offered by the award-winning University Learning and Development Team: http://www.york.ac.uk/admin/hr/training/. The Department strives to address diversity inequalities to ensure that there is a culture that supports equality and encourages better representation throughout the Department. Support for all staff at all stages of their career is recognised as being extremely important; individuals will be allocated a specific mentor to help support them in future career development.

Social events are also held regularly for members of staff. Opportunities for employment for partners exist across the University, Science City York or within the City of York. The Department recognises that employment for partners can be an issue for new employees and will be understanding if you raise this and will do its best to help.

The Department is committed to establishing a culture of environmental good practice and all staff are asked to go about their duties in a resource efficient way and minimise impacts to the environment wherever possible.

The University has recently invested heavily in Chemistry. The Dorothy Hodgkin Building was completed in two phases. The first, housing Analytical Science and Synthetic Chemistry, opened in 2005, while the second phase housing catalytic, materials and synthetic chemistry was completed in 2012. The department is exceptionally well equipped for NMR spectroscopy and departmental instruments are housed in a purpose-built building opened in 2006, while the Wellcome-Wolfson-funded Centre for Hyperpolarisation in Magnetic Resonance (CHyM) was completed in October 2012. The Wolfson Atmospheric Chemistry Laboratories were opened in 2013 and are currently being extended (2017), while most recently, a two-storey building housing new teaching and research laboratories (to house Green Chemistry) and offices was completed in March 2014. The department has recently secured funding from the Wellcome Trust, the Wolfson Foundation, a generous alumnus and the university to acquire a 200 kV cryo-electron microscope and a building in which to house it. Construction and installation are anticipated in 2018.
Founded on principles of excellence, equality and opportunity for all, the University of York opened in 1963 with just 230 students. In 2017 it is the home of more than 17,000 students across more than 30 academic departments and research centres. Since opening over fifty years ago, we have become one of the world’s leading universities and a member of the prestigious Russell Group.

We are consistently recognised as one of the leading Higher Education Institutes and one of just six post-war universities which appear in the world top 100 (2013-14) and 15th in the Times & Sunday Times league table (2016). The University of York has won six Times Higher Education (THE) Awards and five Queen’s Anniversary Prizes.

The University is proud of its association with Athena SWAN, holding 12 awards in support of gender equality, representation and success for all, with gold awards for Chemistry and Biology and a University-wide bronze award.

Of 154 universities that took part in the Research Excellence Framework (REF) in 2014, The University of York ranked 14th overall and 10th for the impact of our research. The University is consistently in the top ten UK research universities and attracts over £60m a year of funding from research alone.

Our vision is to make the University of York a world leader in the creation of knowledge through fundamental and applied research, the sharing of knowledge by teaching students from varied backgrounds and the application of knowledge for the health, prosperity and well-being of people and society.
Attractive workplace

Centred around the picturesque village of Heslington on the edge of the city of York, our colleges are set in an attractive landscaped campus. York enjoys a safe, friendly atmosphere with facilities including bars, shops, theatres and concert halls all within easy walking distance.

The University has undergone an unprecedented period of expansion and renewal since 2000. We have invested in twenty new buildings on the original campus and have completed the first and second phases of a £750m campus expansion. Our investment in new colleges, teaching and learning spaces, laboratories, research facilities and a new sports village mean there has never been a better time to join us.

During this period of change we’ve worked hard to retain our friendly, informal and collegiate atmosphere, which is important to our core values of inclusivity and interdisciplinarity.

We have a thriving international community and are committed to providing staff moving to York with as much support as possible through our Relocation Package and Welcome Officers.

The University aims to offer a nurturing and supportive environment as an employer. Flexible working hours, nursery facilities, childcare vouchers, cycle to work scheme, generous holidays and an attractive pension scheme all make the University of York one of the region’s leading employers.

For further information please visit our employee benefit pages.
**THE CITY AND THE REGION**

**The City of York**

Internationally acclaimed for its rich heritage and historic architecture, York’s bustling streets are filled with visitors from all over the world. Within its medieval walls you will find the iconic gothic Minster, Clifford’s Tower and the Shambles - just a few of the many attractions.

But York isn’t just a great place to visit - it’s also a great place to live and work. While nourishing a vibrant cosmopolitan atmosphere, York still maintains the friendly sense of community unique to a small city.

Visit [www.visityork.org](http://www.visityork.org) for more information on the city of York.

**Shopping, culture and entertainment**

York boasts specialist and unique boutiques but also all the high street stores on its busy shopping streets. Alongside them you will find cinemas, theatres, an opera house, art galleries, a vast range of restaurants, live music venues and clubs. York is particularly renowned for its multitude of pubs and bars, from the modern to the medieval.

**Housing and schools**

Whether you choose to live close to the city, in one of the surrounding villages or further afield, you will find a wide range of housing within comfortable distance of York and the University. For families, the area has a range of excellent schools both in the state and independent sector.

**Great location**

York is one of Britain’s best-connected cities. Halfway between London and Edinburgh on the East Coast mainline, on intercity trains you can reach London King’s Cross in less than two hours and Edinburgh in two and a half hours. York is also well served by road links, and it is easily accessible from the A1, M1 and the M62.

For those travelling from overseas, Manchester Airport is two hours away and Heathrow Airport just three and a half. Flights from nearby Leeds Bradford Airport provide easy access to mainland Europe. By Eurostar from London St Pancras, Paris is just over six hours away.

**Yorkshire**

The Lonely Planet guide recently declared Yorkshire the third best region in the world to visit. There is something to cater to every taste, whether it be the rugged landscapes of the Moors or the Dales, the picturesque seaside towns of Scarborough and Robin Hoods Bay, the gothic architecture of Whitby or the vibrancy of cosmopolitan Leeds.
Apply online

- Go to https://jobs.york.ac.uk
- Find this job using reference 6274
- Complete the online application form

You will need to submit your completed application by midnight (GMT) on 4 February 2018.

What will I need?

You will need to upload:

- your CV
- a letter describing how you meet the requirements of the job

You will also need details of two referees.

Help and assistance

Direct any informal queries to william.unsworth@york.ac.uk

If you have any questions about your application, contact the HR Services team:

recruitment@york.ac.uk
+44 (0)1904 324835