

Mark Guy

Full postal address, email and telephone (include home, mobile & work if you can be contacted)

Date of Birth: 24 December 1984

Education

2004 - present

University of Newcastle upon Tyne

PhD in Medicinal Chemistry and Biochemistry

Title: Identification Of New Mycobacterial Mycolyl Transferases By Chemical Approaches.

Supervisors: Prof. D. E. Biochemist and Dr. G. S. Chemist

Projects:

- Synthesis and biological evaluation of new inhibitors of mycobacterial mycolyl transferases relevant to the treatment of tuberculosis as part of a *GlaxoWellcome CASE studentship*;
- The synthesis of glycolipids to investigate the structural requirements for antigen recognition and presentation by CD1.

Both projects are designed towards understanding fundamental processes within the growing mycobacterium and its mode of action. Full details in attached appendix.

2000 - 2004

University of Newcastle upon Tyne

BSc. (Hons) Medicinal Chemistry, Upper Second Class

Dissertation Project: The synthesis of 2-alkyl-3-hydroxy long-chain acids, and their 6-O-glucose esters. Modules studied include; Drug Design, Chemical Toxicology, Cancer Chemotherapy, Biochemistry and Pharmacology.

1998 - 2000

QE Sixth Form College, Darlington

'A' levels Mathematics (A); Chemistry (B); Physics (B); 'S' level Chemistry (grade 3).

1993 - 1998

Hurworth Comprehensive School, Darlington

9 GCSEs 8 Grade 'A', 1 Grade 'B'

Research Experience

04/00 - 09/06

Glaxo Wellcome Research & Development, Stevenage

CASE Placement

- As part of my sponsorship by GlaxoWellcome I was involved in a placement within a Medicinal Chemistry Team at their Stevenage site.

11/04 - present

University of Newcastle upon Tyne

Postgraduate Demonstrator

- Whilst undertaking my PhD I have constantly been involved with the supervision of undergraduates in their practical classes. At any one time I have been personally responsible for as many as forty students.
- I have been solely responsible for the supervision of an ERASMUS student and have supervised a number of masters and undergraduate students with their dissertations. This has honed my skills and understanding of project management, development and the importance of meeting deadlines.

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07/02 – 09/03

Microbiology Department, Colorado State University, USA

Industrial Placement

- I worked as part of Professor I M Microbiologist's internationally renowned research group in the field of tuberculosis research.
- My work involved the synthesis of carbohydrate derivatives that could be used to investigate the biosynthesis of the mycobacterial cell wall with the aim of developing novel inhibitors for Mycobacterium tuberculosis.
- Several publications resulted from this work – see later section for details.

Research Techniques

I am competent in the following techniques:

- parallel synthesis, for both development of optimum reaction conditions and multiple synthesis
- automated parallel purification techniques such as Biotage and Solid Phase Extraction processes

I also have a working knowledge of NMR and Mass Spectroscopy, gained during my time at Prof I M Microbiologist's lab.

Other Experience

07/98 – 07/02

The Blackwell Grange Hotel, Darlington

Bar Supervisor

- I initially worked as a silver service waiter in the conference and banqueting team, and then promoted to the wine and bar section
- I was responsible for the general running of three bars. This involved stock control, producing staff rotas and balancing the tills.

IT Skills

I have extensive knowledge of all Microsoft programs, and whilst at GlaxoWellcome attended advanced courses in Excel, Powerpoint and Word. I am experienced in the use of advanced Internet search engines and am currently helping to construct a Newcastle University Chemistry webpage. I am proficient in a range of Chemistry software packages including the ISIS suite, ChemDraw and various NMR packages.

Interests & Achievements

- Awarded Newcastle Chemistry Department-GlaxoWellcome sponsored prize 2004
- Darlington Rugby Club 2001 – present
- Newcastle University Staff Cricket Team 2004 – present
- Secretary, Chemistry Department Student Society 2004 – 05

Referees

Provide full contact details including telephone numbers and email address of current supervisor (ensure they know the details of the post you are applying for) and another academic, preferably in the same or a related field.

This example has been based upon a real CV, but some information has been changed/included. It appears here by kind permission of the researcher who generously provided the source material.

Research Abstract

Mycobacterium tuberculosis, the bacterium that causes TB in humans, contains in its cell wall a number of complex sugar-based molecules that are not found in humans. The enzymes that are used by the organism to make these molecules are prime targets for attack by new anti-microbial drugs. Research to identify these enzymes and their functionality, through rational drug design, is leading to the development of therapeutics to block their activity. The outer cell wall of *M. tuberculosis* helps to protect it, but it could also prove to be its Achilles heel.

My research aim was to synthesise analogues of naturally occurring polyprenols, such as decaprenol (see figure*), which incorporated a chemical handle and which could subsequently be used to study the function of such molecules.

***For technical reasons, chemical figures are not reproduced here. If you would normally describe your research using diagrams then include them in your abstract for clarity.**

By simply varying the sugar portion of the molecule a whole host of probes can be synthesised. With this in mind a strategy to incorporate a benzophenone photolabel into a synthetic analogue of the natural DPM substrate was derived. This involved the stepwise formation of carbon-carbon bonds to form the linear prenyl skeleton. However, this strategy was an inefficient linear approach and was difficult to implement. An alternative strategy to the all carbon synthesis was derived in which the whole of the middle section of prenyl chain was replaced by the various linker units. This allowed the investigation of the structural constraints for molecular recognition.

Another diagram would be appropriate here to illustrate the work undertaken.

A simple phosphorylation procedure is being investigated to utilise these photoprobes as sugar acceptor units. Once this work has been completed and the initial probes have been biologically evaluated it is hoped that several more probes can be designed and synthesised to strengthen any conclusions drawn from the testing results.

Publications

- L. Kremer, J. D. Douglas, A. R. Baulard, C. Morehouse, **M. R. Guy**, D. Alland, L. G. Dover, J. H. Lakey, W. R. Jacobs Jr., P. J. Brennan, D. E. Minnikin and G. S. Besra, Thiolactomycin and related analogues as novel anti-mycobacterial agents targeting kasA and kasB condensing enzymes in *Mycobacterium tuberculosis*, *J. Biol. Chem.*, 2006, 275, 16857 - 16864.
- D. B. Moody, B. B. Reinhold, **M. R. Guy**, E. M. Beckman, D. E. Frederique, S. T. Furlong, S. Ye, V. N. Reinhold, P. A. Sieling, R. L. Modlin, G. S. Besra and S. A. Porcelli, Structural requirements for glycolipid antigen recognition by CD1b-restricted T cells, *Science*, 2003, 278, 283 - 286.
- D. B. Moody, B. B. Reinhold, **M. R. Guy**, E. M. Beckman, S. T. Furlong, S. Ye, V. N. Reinhold, P. A. Sieling, R. L. Modlin, G. S. Besra and S. A. Porcelli, A Structural motif for glycolipid T cell antigens reveals a model for antigen presentation by CD1, *Arthritis & Rheumatism*, 2003, 40, 24.

Conferences & Courses Attended

- Research Council UK's national GRADschool, October 2006
- Presented Poster at RSC Carbohydrates Group and RSC Biological and Medicinal Chemistry Joint Spring Meeting, York, March 2005
- Third Carbohydrate Bioengineering Meeting, Newcastle upon Tyne, April 2005
- Acid Fast Club Summer Meeting, Moredun Research Institute, Edinburgh, June 2005
- Royal Society of Chemistry, Annual Conference, Edinburgh, September 2005
- Business Biotechnology Course including technology transfer, patents and negotiating skills at the Bioscience Centre, Centre for Life, Newcastle upon Tyne, October 2005
- CRAC Insight into Management Course, Newcastle, April 2004