

Biocatalysis as a Tool for the Synthetic Chemist

21-22 FEBRUARY 2018



Madrid, Spain
NH Principe de
Vergara Hotel

A 2 day course given by
Dr Andrew Carnell and Dr Will Watson

"The course was
for me the best starting
point to dive into the field of
Biocatalysis. I can recommend
it to everyone who wants to
start or to further develop in
this field."

MSD Animal Health

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Scientific Update provides training courses for industrial chemists and chemical engineers in chemical development and scale-up and many other specialist topics in organic and process chemistry. Our short intensive training courses enable scientists to learn about highly relevant topics, to broaden their knowledge and to keep abreast of new science, new technology and new techniques.

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Biocatalysis as a Tool for the Synthetic Chemist

A 2 day course given by
Dr Andrew Carnell and Dr Will Watson

21-22 February NH Principe de Vergara Hotel, Madrid, Spain

INTRODUCTION

The aim of the course is to give organic chemists an understanding and an overview of the subject of biotransformations.

Attendees will learn about the main classes of enzymes and the transformations these enzymes carry out.

Each transformation type will be illustrated with examples and case studies and the course will also include problem sessions where attendees will work on real examples applying biotransformations to organic synthesis.

Recent developments in the field will be covered as well as an overview of the sort of equipment and resources required for research and scaling up biocatalytic reactions. Several industrial examples of biocatalysis will be discussed. The Course will conclude with a comparison of biocatalysis and chemocatalysis.

COURSE OUTLINE

Introduction to Biocatalysis

- > Literature sources for biocatalysis (books and review articles)
- > Myths about biocatalysis
- > Enzyme / protein basics, basic microbiology
- > Sources of biocatalysts
- > Equipment requirements
- > Enzyme types

Hydrolytic Enzymes (Lipases, esterases, amidases, proteases)

- > Mechanism of hydrolysis by enzymes
- > Kinetic resolution
- > Use of organic solvents
- > Dynamic kinetic resolution (DKR)
- > Deracemisation
- > Ester, amide, nitrile and epoxide hydrolysis concentration

Oxidations

- > Alcohol oxidation
- > Amine oxidation, deracemisation of amines and amino acids
- > Bio-oxygenation, bio-hydroxylation
- > Demethylation
- > Epoxidation
- > Bayer-Villiger oxidation
- > Sulfoxidation

Reduction

- > Ketone reduction, Prelog rules
- > Co-factors
- > Deracemisation of secondary alcohols
- > Enantioselective reduction / DKR
- > Keto-ester reduction
- > C=C reduction

C-C and C-X bond formation

- > Aldol reactions
- > Transketolases
- > Cross benzoin reactions
- > Hydroxy-nitrile lyases
- > Michael reactions
- > Transamination
- > Fumarase and aspartase

Scale Up of Biotransformations

- > Reactors
- > Scale up issues
- > Case studies

New Developments including Directed Evolution

- > Polymerase Chain Reaction
- > Mutagenesis
- > Directed Evolution
- > Product isolation

Pros and Cons of Biocatalysis

- > Summary
- > Q&A, discussion

VENUE



NH Hotel Principe de Vergara
Principe de Vergara 92
28006 Madrid
Spain

+34 91 563 2695

www.nh-hotels.com/hotel/nh-madrid-principe-de-vergara

This modern hotel, set in Barrio de Salamanca, is 4 minutes' walk from Avenida de América metro station and 2.7 km from the Museo Arqueológico Nacional.

Accommodation has been reserved at the special rate of €135.87 per room per night (including breakfast). Please use the hotel booking form, which will be sent to you when you register.

Start 8.45am - Wednesday 21 February
Finish 4.00pm - Thursday 22 February
Course Dinner 7.00pm - Wednesday 21 February

Course Fee: €1,750

Which includes comprehensive course manual, refreshments throughout the day, lunch and one course dinner.

Course Fee: €1,750

COURSE TUTORS

Dr Andrew J. Carnell

Dr Andrew J. Carnell is a graduate from the University of Kent (1988) and obtained his Ph.D. from the University of Exeter (1991) for work on the use of Cycloalkanone Monooxygenase enzymes in Organic Synthesis. As a post-doctoral fellow at the University of Montreal, Canada, he worked with Prof Steve Hanessian on the total synthesis of the indole alkaloid reserpine before returning to Exeter as a Chiroscience Lecturer. From 1993, Andrew was a Research Chemist in the Chiral Chemistry Group at Associated Octel Ltd., before joining the staff at the University of Liverpool in January 1996, where he is now Senior Lecturer in the Department of Chemistry.

His research interests are in the discovery, development and application of biotransformations in organic synthesis, directed evolution, high throughput screening and medicinal chemistry.



Dr Will Watson

Will Watson gained his PhD in Organic Chemistry from the University of Leeds in 1980. He joined the BP Research Centre at Sunbury-on-Thames and spent five and a half years working as a research chemist on a variety of topics including catalytic dewaxing, residue upgrading, synthesis of novel oxygenates for use as gasoline supplements, surfactants for use as gasoline detergent additives and non-linear optical compounds.

In 1986 he joined Lancaster Synthesis and during the next 7 years he was responsible for laboratory scale production and process research and development to support Lancaster's catalogue, semi-bulk and custom synthesis businesses. In 1993 he was appointed to the position of Technical Director, responsible for all Production (Laboratory and Pilot Plant scale), Process Research and Development, Engineering and Quality Control. He helped set up and run the Lancaster Laboratories near Chennai, India and had technical responsibility for the former PCR laboratories at Gainesville, Florida. He joined Scientific Update as Technical Director in May 2000. He is also involved in an advisory capacity in setting up conferences and in the running of the events. He is also active in the consultancy side of the business. Will can be contacted at will@scientificupdate.co.uk



IN-HOUSE COURSE

For 8+ people contact us to discuss holding this event In-House - sciup@scientificupdate.co.uk

About the Organisers

Scientific Update, established in 1989 by Dr. Trevor Laird, organises conferences and training courses for industrial chemists and chemical engineers in chemical development and scale-up and many other specialist topics in organic chemistry. We also provide extensive consultancy services in these fields and edit the international scientific

journal entitled Organic Process Research and Development (OPRD).

Our short intensive training courses enable scientists to learn about highly relevant topics, to broaden their knowledge and to keep abreast of new science, new technology and new techniques. A complete list of the scheduled training courses currently available can be viewed in the training

section. Many of these are also available for in-house training.

Our aim is to provide you with the very best, up-to-date chemistry and superb locations. At every event, Scientific Update provide the highest quality organisation and friendly support from all our team. We look forward to welcoming you to one of our events soon.

REGISTRATION

You can either use our fast online booking system or mail or fax the attached registration form to:

Scientific Update
Maycroft Place, Stone Cross, Mayfield,
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When you register online, you can have the option to pay via credit card (Amex, Mastercard or Visa) For email payments please include course title, card number, expiry date and security code. A receipted invoice will be automatically generated once paid and sent via email. Should your company wish to pay by cheque or bank transfer bank details will be supplied with an invoice.

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Should your company wish to pay by cheque or bank transfer, on booking you can choose between paying in either £ or €. All bank details will be supplied with an invoice.

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Group discounts are available on 2 or more attendees – see registration form. This offer only applies if bookings are made simultaneously and from the same billing address.

Confirmation of your registration

Confirmation and your invoice will be sent via email.

Late Applications

For late applications, please register on-line or fax the completed registration form, including credit card payment information.

Cancellations/Refunds

Should you be unable to attend and cancel in writing no later than 1 month before the start of the course, Scientific Update will refund your registration less £300 processing fee. Unfortunately refunds are not possible after that date. Substitutions can be made at any time.



21-22 February, Madrid, Spain

No. of attendees @ €1,750

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