



# SCIENTIFIC UPDATE

*We've got chemistry*

## CHEMICAL DEVELOPMENT & SCALE-UP IN THE FINE CHEMICAL & PHARMACEUTICAL INDUSTRIES

Principles and Practice

19-21 MARCH 2019

**Milan, Italy**  
Sheraton Diana  
Majestic

A 3 day course  
presented by  
**Dr Will Watson**  
& **Dr John Studley**

"This was an excellent, well-organised and clearly presented training on scale-up. I learned a lot and this will help me in my work at Dow. I really enjoyed the team problem sessions too! Great speaker!"

**Dow Dupont delegate**

# CHEMICAL DEVELOPMENT & SCALE-UP IN THE FINE CHEMICAL & PHARMACEUTICAL INDUSTRIES

Principles and Practice

Multiple attendees discounts  
**UP TO 15% available**

19-21 March 2019 Milan, Italy, Sheraton Diana Majestic

## INTRODUCTION

Chemical process development is generally not taught as part of degree courses in higher education; the conversion of a synthetic route used for making milligram or gram quantities of a chemical into a process for manufacturing multi-kilogram and tonne quantities is typically learnt "on the job" by chemists in industry. For many years, little chemical development work was published in the literature, until the establishment of the Organic Process R & D journal by Dr Trevor Laird (founder of Scientific Update). Even now, "tricks of the trade" are handed down within individual company organisations, and it can be difficult to gain an awareness of what is involved in chemical development, and of the skills and techniques required to efficiently scale-up chemical processes.

This three-day course, written and presented by highly experienced process chemists from the pharmaceutical and fine chemical industries, provides a comprehensive overview of this fascinating and important element of the chemical industry. A logical investigative approach to all aspects of chemical development is described, with an abundance of case studies from literature, conferences and private communications. The multi-disciplinary nature of chemical development is emphasised, from the initial interaction with laboratory research scientists to the vital partnership with chemical engineers in the pilot plant and in the production environment. The lectures are interspersed with interactive problem sessions, enabling participants to share in the problem solving and troubleshooting typically experienced during chemical development.

## IN-HOUSE COURSE

For 8+ people contact us to discuss holding this event In-House - [sciup@scientificupdate.com](mailto:sciup@scientificupdate.com)

## COURSE OUTLINE

### Introduction

- > The purpose of chemical development

### Synthetic Route Discovery

- > Route design
- > Selecting the best route for scale-up
- > Choice of raw materials, reagents etc

### Costing of Chemical Processes

- > Raw materials
- > Overheads
- > Context

### The Investigative Approach to Chemical Development

- > Optimising Chemical Reactions
- > Making processes robust
- > Minimising scale-up difficulties

### Solvent Effects

- > Often overlooked
- > Key to making a modest process a great process

### Statistical Methods of Optimisation

- > Vital, but under-utilised
- > Design of Experiments
- > Simplex
- > Factorial design

### Analytical Issues

- > In Process Control
- > Quality Control and Specification Setting
- > Regulatory Guidelines
- > GMP, Validation
- > Use of analysis to aid process optimisation

### Work Up

- > Product isolation

### Planning for Scale-Up

- > Key points to consider

### Appreciation of Chemical Engineering Principles

- > Mass Transfer
- > Mixing
- > Heat Transfer
- > Kinetics

### Crystallisation and Polymorphism

- > Particle size control
- > Polymorph control
- > Methods of analysis
- > Crystallisation of chiral compounds

### New and Emerging Technologies in Process R&D

- > Microwave chemistry
- > Continuous flow chemistry
- > Process intensification

### Thermal Hazard Testing and Runaway Reactions

- > Essential process safety considerations
- > Equipment and screening approaches

### Effluent Minimisation and Control

- > Environmental considerations
- > Cost considerations
- > Green chemistry

## VENUE

### Sheraton Diana Majestic

Viale Piave, 42  
Milan,  
20129  
Italy

[www.sheratondianamajestic.com](http://www.sheratondianamajestic.com)

Offering beautiful gardens and free Wi-Fi throughout, the Sheraton Diana Majestic is set in a charming Art-Nouveau building next to Porta Venezia Metro Station.

Rooms at the Diana Majestic have a classic design with carpeted floors and large windows. All air conditioned, they also feature internet access and a flat-screen TV with satellite and pay-per-view channels.

The popular H club>Diana is open throughout the day for meals and aperitifs, which can be enjoyed either in the garden or on the terrace. When feeling active you can work out at the free gym.



# SCIENTIFIC UPDATE

We've got chemistry

**Start** 9.00am - Tuesday 19 March

**Finish** 3.30pm - Thursday 21 March

**Course dinner** 8.00pm - Tuesday 19 March

**Course Fee:** €2,199

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

**Course fee:** €2,199

## COURSE TUTORS

### Dr Will Watson

Technical Director,  
Scientific Update



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@scientificupdate.com](mailto:will@scientificupdate.com)

### Dr John Studley

Scientific Director,  
Scientific Update



John started his industrial career at Rhone-Poulenc (formerly RTZ chemicals) in Avonmouth- Bristol, working on fluorination technology, before gaining a chemistry degree and organic chemistry PhD at the University of Bath in 1995. He then did postdoctoral research at the University of Sheffield before joining the process chemistry group at Oxford Asymmetry working on route development and optimization, scale-up and custom synthesis.

In 1999 John joined Vertex Pharmaceuticals (Europe) in the discovery chemistry department, spending a number of years working in oncology and inflammation therapeutic areas. He then formed a scale-up group to support synthesis of pre-clinical candidate molecules and intermediates and in 2010 oversaw construction and commissioning of a new kilo lab facility. In 2012 John was appointed to head of process chemistry for Vertex (Europe), overseeing synthesis of compounds for preclinical toxicology assessment, designing safe, scalable synthetic routes and working with external vendors and global CRO's to deliver key intermediates and develop new enabling technologies. He was also responsible for developing chemistry for cGMP synthesis of early phase clinical material.

John recently joined Scientific Update as Scientific Director. He is involved in running training events and advising on scientific content for the conference programme. He also supports the consultancy arm of the business and has a keen interest in scientific writing and communication.

@ [johns@scientificupdate.com](mailto:johns@scientificupdate.com)

## 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,  
East Sussex, TN20 6EW, UK

Fax Number +44 1435 872734

### How to Pay

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.

### Bank Transfer or Cheque

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.

### Group Discounts

Group discounts are available on two 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

These will be sent via email.

### Late Applications

Late applications are permitted depending on availability, please register on line and pay by credit card only.

### 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 (or equivalent in €/£) processing fee. Unfortunately refunds are not possible after that date. Substitutions can be made at any time.

### At the end of the course, participants will have gained:

- > A logical investigative approach to chemical development and optimisation
- > An insight into the factors involved in scale-up
- > An appreciation of chemical engineering concepts, particularly mixing, heat transfer and process control
- > A preliminary knowledge of statistical methods of optimisation
- > Improved ability to decide which parts of the chemical process to examine in detail
- > Ideas for efficient resource allocation
- > Improved troubleshooting and problem solving ability

# CHEMICAL DEVELOPMENT & SCALE-UP

19-21 March 2019 Milan, Italy



## FAST ONLINE REGISTRATION

Look for the **BOOK NOW** button  
on the event of your choice  
[www.scientificupdate.com](http://www.scientificupdate.com)

No. of attendees  @ €2,199

**Special Offer!** Register 2 delegates and receive 5% on 2nd booking  
Register 3 delegates and receive 10% on 3rd booking  
Register 4 or more delegates and receive a 15% discount

### First attendee

Company   
Title (Dr/Prof/Mr/Mrs/Ms)   
First name   
Surname   
Job Title   
Address   
  
  
Post Code / Zip   
Country   
Tel   
Fax   
Email   
Mobile   
Special Diet   
I would like to subscribe to your FREE bi-monthly newsletter  
What's new in Process Chemistry?

### Second attendee **SAVE 5%**

Title (Dr/Prof/Mr/Mrs/Ms)   
First name   
Surname   
Job Title   
Tel   
Fax   
Email   
Special Diet   
I would like to subscribe to your FREE bi-monthly newsletter  
What's new in Process Chemistry?

### Third attendee **SAVE 10%**

Title (Dr/Prof/Mr/Mrs/Ms)   
First name   
Surname   
Job Title   
Tel   
Fax   
Email   
Special Diet   
I would like to subscribe to your FREE bi-monthly newsletter  
What's new in Process Chemistry?

### Invoice Address (if different to delegate address)

Address   
  
  
Post Code / Zip   
Country   
Tel   
Fax

Please invoice my company

Purchase Order:

Promotion Code:

### Payment Methods

Payment will be made by:

Cheque  Bank Transfer  Credit Card

In Currency:

Euros  GBP\*  or Dollars\*

We accept the following credit cards:



Amex\*



Mastercard



Visa

To pay by credit card a secure link will be provided once you receive your booking confirmation email, this will then take you to a secure payment gateway.

\*payments via Amex can only be made in US dollars

#### \* Currency Payments

If you select to pay in GBP, or Dollars the amount charged will be based on the exchange rate at the time of preparing the invoice.

#### Discounts

Complete the details for either two or three delegates and your discount will automatically be applied. This offer only applies where all delegates are booked simultaneously and at the same billing address.

#### Cancellations

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 fee less £300 (or equivalent in €/ \$) processing fee. Unfortunately refunds are not possible within 1 month of the course date. Substitutions can be made at any time.

#### Data Protection

Scientific Update Ltd is registered under the Data Protection Act 1998. We will store your information securely and only share your contact details with other attendees at this event. If you are happy for your details to be passed to any third parties please tick here:

For full terms of business and payment details please see our website

**Please complete this form and fax to +44 (0)1435 872734**

You can also download the PDF from [www.scientificupdate.com](http://www.scientificupdate.com), complete the form online and email back  
Scientific Update, Maycroft Place, Stone Cross, Mayfield, E. Sussex TN20 6EW, UK  
+44 (0)1435 873062 [sciup@scientificupdate.com](mailto:sciup@scientificupdate.com)