

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



**FACE TO
FACE** Events

3 DAY COURSE

Join our tutor in person
for this professional
training course.



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UPDATE**

We've got chemistry



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Events

6 SESSIONS

Presented virtually through
an online platform

INVENTIVA DELEGATE

*"Very Comprehensive
overview of the Chemical
Development activities with
numerous examples - Think
to apply, think to keep."*



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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.

WHO SHOULD ATTEND?

- Young Chemists
- Organic Chemists/Medicinal Chemists
- Development and Production Chemists
- Chemical Engineers
- Students
- Experienced Chemists
- Analytical Chemists
- Managers

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 point 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

ONLINE COURSE

Delivered in six sessions of 3 hours each at 2.00PM to 5.00PM each day. Based upon UK Time.

Fee includes: web link to watch all six sessions, electronic version of the course manual and certificate.

FACE TO FACE COURSE

Three day course, running from 9.00AM to 5.00PM each day – local timings.

Delegate Fee includes: all refreshments, lunch, one course dinner, course manual and certificate.

COURSE TUTOR



Dr Will Watson
Technical Director,
Scientific Update

Will gained his PhD in Organic Chemistry from the University of Leeds in 1980, and joined Scientific Update as Technical Director in 2000.

Andy studied Natural Science at King's College London, followed by a PhD in organic chemistry at The University of Leeds. He joined Scientific Update in 2018.



Dr Andy Jones
Consultant,
Scientific Update



Dr John Studley
Scientific Director,
Scientific Update

John gained his PhD in Organic Chemistry from the University of Bath in 1995, and joined Scientific Update as Scientific Director in August 2018.

John studied for his PhD at Cambridge, and was Technical Director at CatSci Ltd prior to joining Scientific Update as an associate.



Jonathan Moseley
Associate,
Scientific Update

Full biographies available on the Scientific Update website.

WHAT WILL ATTENDEES GAIN?

- 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



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IN-HOUSE COURSE

For 13+ people contact us to discuss holding this event In-House -
sciup@scientificupdate.com

REGISTRATION

Use our **fast online booking system by visiting**
www.scientificupdate.com

Alternatively you can 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). A receipted invoice will be automatically generated once paid and sent via email. Should your company wish to pay by cheque or bank transfer, on booking, 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

For late applications, please register online 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 £300.00 (or equivalent in €/\$) processing fee. Unfortunately refunds are not possible after that date. Substitutions can be made at any time.



EVENT:

DATES:

LOCATION:

No. of attendees

Face-to-face



Online



FAST ONLINE BOOKINGS

You can easily register through our website! Simply look for the **'Book now'** button on the event of your choice. www.scientificupdate.com

First attendee

Company

Title (Dr/Prof/Mr/Mrs/Ms)

First name

Surname

Job Title

Address

Post Code / Zip

Country

Tel

Fax

Email

Mobile

Dietary Requirements

I would like to 'OPT-IN' to receive e-mails from Scientific Update about news and other events:

Second attendee

Title (Dr/Prof/Mr/Mrs/Ms)

First name

Surname

Job Title

Tel

Fax

Email

Dietary Requirements

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Third attendee

Title (Dr/Prof/Mr/Mrs/Ms)

First name

Surname

Job Title

Tel

Fax

Email

Dietary Requirements

I would like to 'OPT-IN' to receive e-mails from Scientific Update about news and other events:

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Country

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Please invoice my company

Purchase Order:

Promotion Code:

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Bank Transfer

Credit Card

In Currency:

Euros

GBP

or Dollars

We accept the following credit cards:



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Mastercard



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*payments via Amex can only be made in US dollars

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If you select to pay in a different currency than the event is advertised in, the amount charged will be based on the exchange rate at the time of preparing the invoice.

Discounts

Offers available on selected events. For more information, please visit our website.

Cancellations

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

Please complete this form and send to sciup@scientificupdate.com

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