

# Pharmaceutical Co-Crystals 2009

Transforming Co-Crystal Research into Commercial Success

"This conference  
is perfect"  
Michel Boekkrink,  
Avantium  
Technologies

21st – 23rd September 2009 • Mövenpick Hotel, Amsterdam, The Netherlands  
Main conference 21st – 22nd September 2009 • Workshops 23rd September 2009

## Featuring Innovative Insights from:

**Dr Jeffrey A. Lindeman**, Member, *O'Brien Jones PLLC*

**Dr Anita Coetzee**, Director Product Development  
Systems, *Avantium Technologies*

**Senior Representative**, *European Patent Office*

**Dr Ir. J.H. Ter Horst**, Intensified Reaction and Separation  
Systems, *Delft University of Technology*

**Dr Annette Bak**, Director, Pre-Formulation and Basic  
Research Support, *Merck*

**Dr Michael-Robin Witt**, Chief Technology Officer,  
*Axcentua*

**Darren Andrews**, Business Development Director,  
*Cobalt Light Systems*

**Dr Vishweshwar Peddy**, Senior Scientist, Head of Solid  
State Group, *Dr Reddys*

**Associate Professor Nair Rodriguez-Horendo**,  
Department of Pharmaceutical Sciences,  
*University of Michigan*

**Dr Ahmad Sheikh**, Group Leader, Solid State Chemistry,  
*Abbott Laboratories*

**Professor Mike Zawortoko**, Professor and  
Chairperson, Department of Chemistry,  
*University of South Florida*

**Dr Irene Van Doormalen**, Development Scientist,  
*Schering Plough*

**Dr Jerome Menegotto**, Discovery Analytics,  
Head of Solid State Laboratory, *sanofi-aventis*

**Dr Rob Geertman**, Group Head Solid State  
Chemistry, *Organon*

**Dr Christopher Frampton**, Chief Scientific  
Officer, *Pharmorphix*

**Dr Peter Kaprinski**, Principal Fellow and Leader  
of US Salt and Polymorphism and Particle  
Engineering networks, *Novartis  
Pharmaceuticals*

- **Extend your patent lifecycle** by adopting co-crystal development techniques, special insight from the *European Patent Office*
- **Improve compound properties** by incorporating co-crystals to **accelerate your development**, key insights from *Organon*
- **Benchmark against industry leaders** to **gain best practice** tips to incorporate into your co-crystal projects, examples given by *Dr Reddy's*
- **Analyse the industry trends**, to see what other developments need to occur before your company can achieve market integration
- **Improve compliance and avoid unnecessary litigation** by gaining insight into the latest case law updates, exclusive presentation from *Jeffrey Lindeman, O'Brien Jones PLLC*

## NEW FOR 2009!

- 1 10 Brand new case studies from leading industry speakers
- 2 Gain access to joint networking with the Pharmaceutical Amorphous Materials meeting, visit [www.iqpc.cpm/nl/amorphous](http://www.iqpc.cpm/nl/amorphous) for more details
- 3 Exciting strategic overview, make your research more commercial with Annette Bak, Merck

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### Session sponsors



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### Featured exhibitor



[www.ccdc.cam.ac.uk](http://www.ccdc.cam.ac.uk)



08.15 **Registration and Coffee**

08.45 **Chair's Opening Address**

## The Legal Landscape

08.55 **US Case Law Update – Judicial Decisions Impacting Co-Crystal Patent Strategy**

- Recent decisions suggesting how US courts may view co-crystal patents
- Analysis of Abbott v. Sandoz (Fed. Cir. 2009): Crystalline Forms and Product-by-Process
- Analysis of Sanofi-Synthelabo v. Apotex (Fed. Cir. 2008) and others: Enantiomers
- Analysis of Pfizer v. Apotex (Fed. Cir. 2007) and others: Salt Forms
- Analysis of US Board of Patent Appeal decisions
- Designing and implementing effective patent strategies for co-crystal patents

**Dr Jeffrey A. Lindeman**, Member, *O'Brien Jones PLLC*

09.40 **Evaluating, designing and making co-crystals for improved morphology and bulk physical properties**

- Co-crystals in pharmaceutical industry
- Current state of co-crystal screening
- From structure to morphology and surface chemistry and bulk properties
- Co-crystallisation process design

**Ahmad Shiekh**, Associate Research Fellow, Group Leader, Solid State Chemistry, *Abbott Laboratories*

10.25 **Networking Coffee**

10.55 **Discovering New Co-Crystals**

- The benefits of co-crystals
- The many ways to make a co-crystal (Cooling and evaporative crystallisation, solvent mediated transformation, grinding)
- How to screen for new co-crystals – making use of the co-crystal phase diagram
- Co-crystals in practice – changing properties and processes

**Dr Ir. J.H. Ter Horst**, Intensified Reaction and Separation Systems, *Delft University of Technology*

## Strategic Overview

11.40 **A Strategy for Integrating Pharmaceutical Co-Crystals into Drug Development**

- Effectively conducting a current state and gap analysis
- Deriving the strategy: a step-by-step guide
- Defining the measures of success with current case studies examples

**Dr Annette Bak**, Director, Pre-formulation and Basic Research Support, *Merck*

## Industrial Insight

12.25 **Characterisation of Crystalline and Non-Crystalline Materials by Transmission Raman Spectroscopy (TRS)**

- Novel rapid measurement capability
- Bulk measurement that also works on powders, (coated) tablets and intact capsules
- Sub-second quantitative analysis of crystalline state (phonon modes)

of molecules and mixtures

- Crystalline and chemical content for formulation analysis and polymorph screening in a single measurement

**Darren Andrews**, Business Development Director, *Cobalt Light Systems*

12.40 **Networking Lunch**

13.40 **Co-Crystal Screening of Natural Products: A Case study of Accelerated Drug Development**

- Drug discovery and development process
- The role of natural products in drug discovery
- Multi-targeted and combination therapies in oncology
- Case study: AxP 107-11

**Dr Michael-Robin Witt**, Chief Technology Officer, *Axcentua*

14.25 **Elucidation and Characterisation of Co-crystals**

- Screening salts, polymorphism and also co-crystals?
- What analysing techniques are needed for elucidation and characterisation of co-crystals
- Measurements and criteria for further development

**Dr Irene Van Doormalen**, Development Scientist, *Schering Plough*

15.10 **Networking Coffee**

15.40 **Effective Development of an API: Co-Crystal from Design to Characterisation**

- Design phases of co-crystal development, issues and conclusions pertinent to the industry now
- Synthesis phases of co-crystal development, conclusions with regards to co-former selection
- Characterisation - pitfalls and lessons learnt throughout the development process

**Dr Vishweshwar Peddy**, Senior Scientist, Head of Solid State Group, *Dr Reddys*

16.25 **Elucidation and Characterisation of Co Crystals**

Understanding how co-crystal solubility is influenced by co-crystal components and solution chemistry is essential to engineer co-crystals with customised solubility and streamline co-crystal discovery and selection. This talk will present approaches that are valuable to determine co-crystal/solution phase behaviour and guide co-crystal selection without the time and material consuming requirements of traditional methods. Participants will learn about the following:

- Is there a relationship between co-crystal solubility and component properties?
- How is co-crystal solubility influenced by solution chemistry?
- How do component pKa and solution pH affect co-crystal solubility and stability?
- How to assess co-crystal solubility when equilibrium is not realised?
- What are key indicators of co-crystal solubility and stability?

**Associate Professor Nair Rodriguez-Horendo**, Department of Pharmaceutical Sciences, *University of Michigan*

17.10 **Chairperson's Closing Remarks**

17.25 **Close of Conference Day One**

## Session sponsors



**Services:** 1. Optimal polymorphs, salts and co-crystals identification 2. Amorphous API stabilisation via solid dispersions 3. Comprehensive form space identification to safeguard IP rights 4. Solubility screening programs 5. Crystallisation process development 6. Enantiomer separation via chiral resolution

**Systems:** **Crystalline** - New! The 5-ml crystalliser with overhead stirring, refluxing capabilities and visualization of the crystallisation process.

**Crystal16** - The established 1-ml crystalliser for medium-throughput studies in solid-state research and process development.

**Avantium Crystallisation Workflow:** Your own high-throughput Solid State Research laboratory based on proven Avantium Technologies.



### Pharmorphix Ltd.

Pharmorphix was founded in July 2003 as a spin out from Millennium Pharmaceuticals and quickly established itself as a world leading provider of solid form services to the pharmaceutical and biotechnology research sectors. The focus of the company is to provide clients with the knowledge necessary to successfully progress their molecules through to the clinic. Pharmorphix was acquired by SAFC Pharma in August 2006 and is now a member of the Sigma Aldrich group.

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**O'BRIEN JONES, PLLC** understands that intellectual property is a valuable company asset. With that in mind, we build relationships with our clients to understand their business and how intellectual property can enhance it - developing and implementing strategies that vigilantly protect and defend their intellectual property. O'Brien Jones has a strong chemical and pharmaceutical group with experience in small molecules, specialty chemicals, formulations and particular expertise with amorphous and crystalline forms of drugs, including co-crystals.

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## Featured exhibitor



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**The Cambridge Crystallographic Data Centre** provides scientific software solutions for rational drug design and pharmaceutical materials development. Structural analysis of polymorphs, salts and co-crystals is now aided by the new Materials Module of Mercury ([http://www.ccdc.cam.ac.uk/products/csd\\_system/materials\\_module/](http://www.ccdc.cam.ac.uk/products/csd_system/materials_module/)) which contains advanced tools for qualitative and quantitative investigation of motifs and packing patterns.

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**08.15 Registration and Coffee**

**08.45 Chair's Opening Address**

## Analysing the Properties of a Co-Crystal

**08.55 Preparation and Structural Analysis of Co-Crystal Phases**

Pharmorphix is one of Europe's leading providers of solid-form research services to the international pharmaceutical and biotech industries. The ability to prepare co-crystals in significant quantities is one of the major challenges that still need to be overcome in order for this field to become an economically viable method of producing new drug products. Pharmorphix laboratories investigate how both traditional and new methodologies can be employed to overcome these problems.

Please visit [www.iqpc.com/nl/cocrystals](http://www.iqpc.com/nl/cocrystals) for more details

**Dr Christopher Frampton**, Chief Scientific Officer, *Pharmorphix*

**09.40 Structure Property Relationships**

- Co-Crystal definitions
- Current state of co-crystal screening
- Increasing success and priority of co-crystal screening
- Literature case-studies and internal company case studies for the progression over the last 12 months

**Dr Ahmad Sheikh**, Group Leader, Solid State Chemistry, *Abbott Laboratories*

**10.25 Networking Coffee**

**10.55 Structure-Property Relationships in Multiple Component Crystalline Solids**

The importance of structure property relationships is becoming ever more apparent in the field of co-crystals and particularly in current environments to understand the physical composition of a compound and the properties that will in turn exhibit. Mike has worked extensively in the area of Co-Crystals for a number of years but has been focusing a large part of his research in the last year in this area. With brand new case study examples this is set to be a really thought provoking talk.

For more details on this talk please visit [www.iqpc.com/nl/cocrystals](http://www.iqpc.com/nl/cocrystals)

**Professor Mike Zawortoko**, Professor and Chairperson, Department of Chemistry, *University of South Florida*

**11.40 Beyond Two-component Co Crystals: Ternary Co-Crystals**

- Need for ternary co-crystals
- Feasibility of manufacture
- Case-study example

**Dr Peter Kaprinski**, Principal Fellow and Leader of US Salt and Polymorphism and Particle Engineering networks, *Novartis Pharmaceuticals*

**12.25 Networking Lunch**

**13.30 Co-Crystals and Amorphous Formulations to Significantly Increase the Bioavailability of Insoluble Weak Bases: A Case Study in Sanofi-Aventis Discovery**

- Case study results on a very insoluble weak base to improve bioavailability to facilitate its entry into development
- Discussion of a internally developed co-crystal screening methodology based on a co-former in-silico selection that uses clusterisation of co-formers
- An overview of whole methodology from the screening to the scale-up and Phys-chem and In-vivo evaluations of the obtained co-crystal will be exposed
- In addition, a summation of a amorphous API study on the same compound to help improve its bioavailability
- Analysis and comparison of the failures and successes of each approach and in-vivo results obtained from each process

**Dr Jerome Menegotto**, Discovery Analytics, Head of Solid State Laboratory, *sanofi-aventis*

**14.15 The Why and How of Co-Crystals from a Development Perspective**

- When are co-crystals interesting?
- What requirements should they meet?
- What are the pitfalls?
- How can co-crystal screening be tied in the normal development process

**Dr Rob Geertman**, Group Head Solid State Chemistry, *Organon*

**15.00 Networking Coffee**

**15.30 Round table Discussion: Streamlining Your Development Processes**

This discussion session will enable participants to discuss issues surrounding:

- Process and pre-formulation difficulties, identification and potential solution implementation
- The potential positive effects on your bottom line

**16.15 Chairperson's Closing Remarks**

**16.30 Close of Conference Day Two**

# Pharmaceutical Co-Crystals Workshop Day: 23rd September 2009

**07.45 – 08.00 Registration and Coffee**

**08.00 – 08.30 Transport to Avantium Technology**



Please note attendance maybe restricted. Please call for more information

**08.30 – 12.30 Workshop One – Co-Crystallisation with the Crystalline™, A New Bench Top Reactor for Solid State Research**

The Crystalline™ is a small scale parallel crystalliser with particle visualisation capabilities in combination with programmable temperature control and transmission analytics. The instrument operates on a milliliter scale (1-5 ml working volume) and incorporates through the vial analytics, making it possible to scan many conditions for possible habit changes, enabling rapid screening during process development. During the workshop you have the opportunity to become familiar with the capabilities of the Crystalline™. You will see how you can optimise your co-crystallisation process.

**12.30**

**13.30 – 16.00**

**Dr Ir. J.H. Ter Horst**, Intensified Reaction and Separation Systems, *Delft University of Technology*  
**Dr A. Coetzee**, Director Product Development Systems, *Avantium Technologies*

**Return to hotel** Please note attendance maybe restricted. Please call for more information

**Workshop Two – Characterisation of Co-Crystals**

Whilst this is a topic which has been addressed in numerous papers and reports globally it is one essential to get right, the correct understanding and essential techniques to characterise a co-crystal are necessary for further development. Incorrect characterisation can be detrimental to the whole project, which is why we have organised a discussion forum where top tips and best practices can be shared for you to ensure you are using the most suitable techniques in the most effective way. (Including networking coffee break)

Facilitated by: **Dr Peter Kaprinski**, Principal Fellow and Leader of US Salt and Polymorphism and Particle Engineering networks, *Novartis*

## Media partners



## Sponsorship and Exhibition Opportunities

### Why Now?

Is all you're hearing "Faster, quicker, better properties, improve your ROI?" The pressure is on for everyone in the current economic climate to push compounds into the next stages of development, faster than the competition and in an efficient cost-effective way. Pharmaceutical companies are focusing on speeding up the development process, in order to do this they need to employ the latest technology and services available from within the market. In a saturated market Amorphous materials help find solutions to identify those most actively seeking assistance in these challenging times.

### Networking at the Event

Gain unparalleled networking opportunities, with a large number of senior decision makers, with unrivalled discussion session, extended breaks and in-depth workshops. Spend critical face to face time with academic industry experts; utilise this time to help find solutions to your challenges. Attend dedicated networking activities to cement the relationships you will build throughout the conference in a more relaxed environment – from informal networking to organised dinners.

### What Pharmaceutical Co-Crystals Offers...

Pharmaceutical Co-Crystals will provide you with direct access to an elite audience of senior decision makers from department heads to group leaders. The event is carefully structured and designed to provide valuable opportunities for you to showcase your capabilities and develop valuable new business relationships. This event is unique, as Pharmaceutical Co-Crystals runs alongside our Pharmaceutical Amorphous Materials meeting there are joint networking sessions, providing you with access to double the audience!

For sponsorship and exhibition opportunities contact Gal Cohen on +44 (0) 207 368 9300 or email [sponsorship@iqpc.co.uk](mailto:sponsorship@iqpc.co.uk)



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