

# Synthesis and Solid State Pharmaceutical Centre (SSPC)

The Synthesis and Solid State Pharmaceutical Centre (SSPC), a global hub of pharmaceutical process innovation and advanced manufacturing, funded by Science Foundation Ireland and industry, is a unique collaboration between 24 industry partners, nine research performing organisations, and 12 international academic collaborators.

A World  
Leading SFI  
Research  
Centre



With €42 million in direct funding and a further €39 million leverage, SSPC supports a community of over 350 individual national and international active members, including 29 Investigators, 40 post-doctoral researchers and 60 PhD candidates. The SSPC leads the way for next generation drug manufacture and spans the entire pharmaceutical production chain from synthesis of the molecule, to the isolation of the material, and formulation of the medicine.

## Research Areas

- › Strand 1: New Frontiers in Pharmaceutical Synthesis
- › Strand 2: Crystal Growth and Design
- › Strand 3: Drug Product Formulation and Manufacture

## Research Programmes

The SSPC community of 132 researchers is involved in 20 research projects. Recent collaborative projects include:

- › An SFI-funded SPOKES project MOMENTUM (Modelling of Multi-Phase Transport Processes to Enable Automation in Manufacturing), a collaboration between SSPC and industry partners Johnson & Johnson Automation Centre of Excellence and Rusal AAL
- › An SFI funded US-Ireland R&D partnership and first of its kind "Centre to Centre" project to research continuous manufacturing for nano-based pharmaceutical drugs. (International collaboration)
- › Advanced biopharmaceutical technologies. SSPC works with seven industry partners and three research-performing organisations

## Facilities

- › Kilo labs
- › In-situ PAT systems
- › Labmax TM reaction vessel
- › Particle visual measurement (PVM)
- › X-ray diffraction (XRD)
- › Focused ion beam (FIB) milling system
- › Atomic force microscope (AFM)
- › SEM/Raman spectroscopy
- › SEM & TEM microscopy
- › Molecular and eEngineering modelling
- › Powder extrusion suite
- › Hot melt extrusion
- › Supercritical spray drying
- › Flow NMR
- › IR spectroscopy
- › Environmental SEM
- › In situ Raman microscopy
- › Crystallization, Isolation and Drying Technology Test Bed (CIDT<sup>2</sup>)

## Industry and Commercialisation

SSPC works with 24 industry partners to deliver relevant solutions that address the manufacturing needs of pharmaceutical companies. At a corporate level, SSPC industry partners recognise the power of the collective and can facilitate unique collaborations. APC Ltd., a SSPC spin-out company, has created over 40 highly skilled jobs within the pharmaceutical sector.

SSPC's Dr Patrick Frawley and Dr Brian de Souza, worked with Pfizer Global Process Development Centre, discovering a new commercial process to deliver an innovative, improved manufacturing process for a world leading medicine.



HOST INSTITUTION

UNIVERSITY of LIMERICK  
OILSCOIL LUIMNIGH

PARTNER INSTITUTIONS

UCD  
DUBLIN

nibr

AIT  
ADVANCED INSTITUTE OF TECHNOLOGY

DCU  
DUBLIN CITY UNIVERSITY

Trinity  
College  
Dublin  
The University of Dublin

UCC  
UNIVERSITY COLLEGE CORK, Ireland  
Coláiste na Tríonóide, Corcaigh

Waterford Institute of Technology  
INSTITIÚD TEICNEOLAÍOCHTA AN tOIRLEÁIRGE

NUI Galway  
OÉ Gaillimh

## Industry Partners Include:

- › Abbvie
- › AVARA
- › Johnson & Johnson Automation Centre of Excellence
- › Alkermes
- › Allergan
- › Amebis
- › APC Limited
- › Biomarin
- › Bristol Myers Squibb
- › Clarochem Ireland
- › Eirgen Pharma
- › Eli Lilly
- › FMC
- › Genzyme: A Sanofi Company
- › Glantreo
- › GlaxoSmithKline
- › Innopharma Labs
- › Janssen
- › Merck Sharp & Dohme
- › Novartis
- › Pfizer Inc
- › Roche
- › Rusal AAL
- › Scale-Up Systems

## Education and Public Engagement:

SSPC in collaboration with Science Foundation Ireland, is involved in many local and national events including Science Week, National Ploughing Festival, SSPC National Crystal Growing Competition, chemistry demonstration workshops and more. SSPC provides professional development training to teachers and connects post-primary students with access to scientists via the Smart Futures programme. SSPC actively supports industry partners and their research associates through industry focused upskilling and training. SSPC also provides an industrial placement programme for PhD candidates.



## Key Contacts

### Prof Michael Zaworotko

Scientific Director  
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Professor Zaworotko is a Bernal Chair of Crystal Engineering at the University of Limerick. He is among the world's top 20 research chemists and secured the first award under the relaunched Science Foundation Ireland (SFI) Research Professor programme. His research interests focus on designing crystal structures that can be used in the pharmaceutical and energy industries.

### Professor Gavin Walker

Scientific Director  
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Professor Gavin Walker is Bernal Chair of Pharmaceutical Powder Engineering and a principal investigator in the SFI Investigators Programme at UL and the SSPC Spokes Project, MOMEnTUM. His expertise is in pharmaceutical process engineering and modelling of particulate systems.

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