

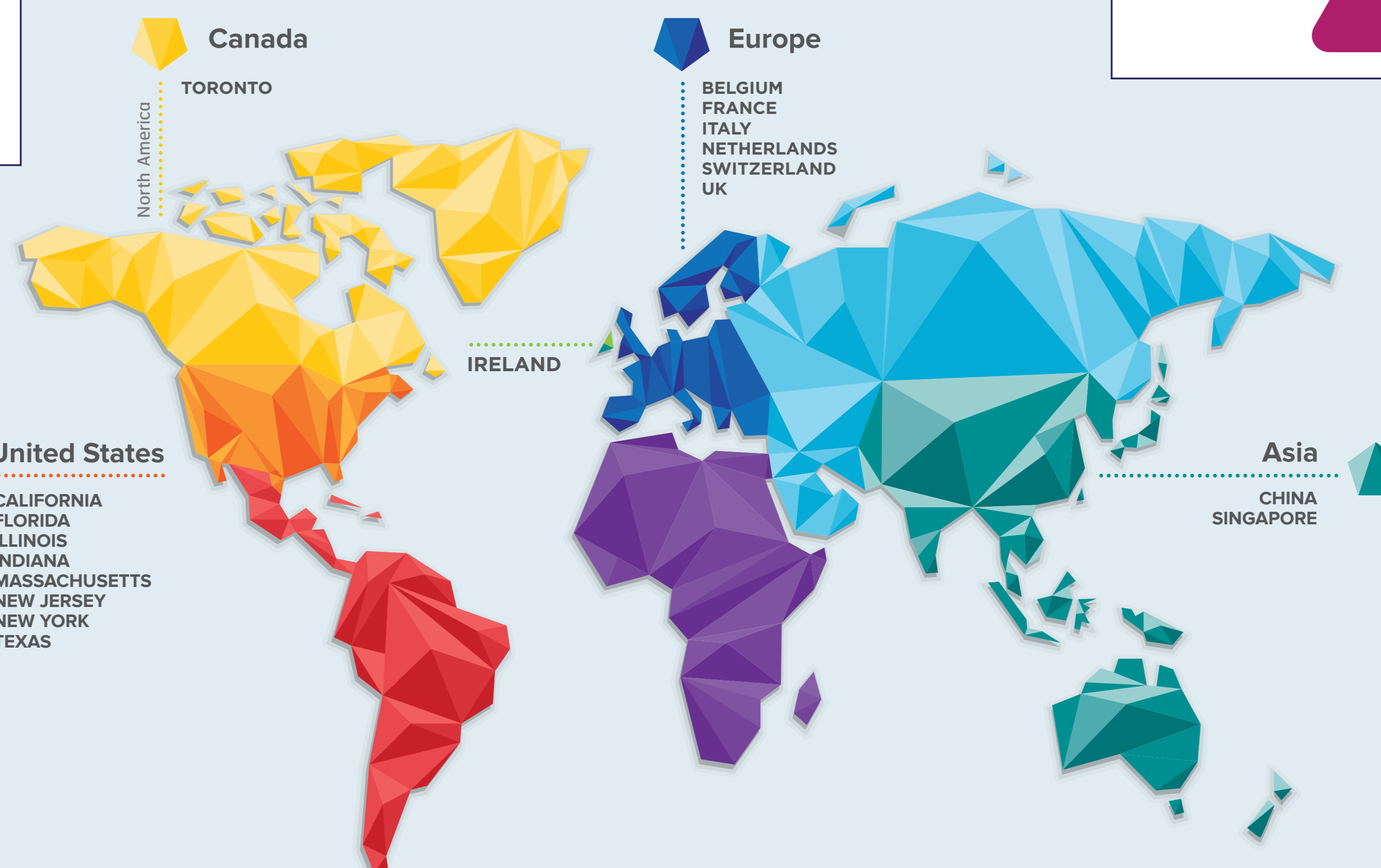
**2004 -2007**  
CRYSTALLISATION  
in BULK CHEMICALS

- €1 MILLION from Marie Curie Transfer of Knowledge
- 1 PROJECT



**SSPC MISSION**

TO POSITION IRELAND AS A GLOBAL HUB FOR PROCESS INNOVATION AND ADVANCED MANUFACTURING IN THE PHARMACEUTICAL INDUSTRY



**MOLECULE:**  
NEW FRONTIERS IN PHARMACEUTICAL SYNTHESIS



Enantioselective and efficient synthetic routes and processes.

**MAJOR THEMES:**

- New catalysts and systems for cleaner production with excellent selectivity in asymmetric synthesis, elimination of hazardous reagents and operation in benign conditions
- Innovative process technologies operating in flow conditions and where appropriate achieving multiple transformation steps in a single reactor
- New chemical methods for the efficient removal of impurities and side products



**2007-2013**  
CRYSTALLISATION within the PHARMACEUTICAL SECTOR

- €9 MILLION from SFI & Industry
- 9 Industry Partners
- 5 Irish Academic Institutions
- 13 Research Projects
- 6 Post-Doctoral Researchers
- 20 PhD Candidates
- 50 Members

Solid State Pharmaceutical Cluster

CONTINUOUS CRYSTALLISATION PROJECT  
€2 MILLION



**MATERIAL:**  
CRYSTAL GROWTH & DESIGN



Science & process engineering underpinning the crystallisation of complex organic molecules with conformational flexibility & a multitude of functional groups. Impurities & solvent selection are central.

**MAJOR THEMES:**

- Study of the underlying molecular interactions in supersaturated solutions and at interfaces
- Understanding the mechanisms that control product crystal properties such as crystal structure, purity, shape and size
- Exploiting these mechanisms to tailor and control crystal properties, to scale up and scale down processes, to develop model based control for improved product quality in traditional batch crystallisations as well as in emerging technologies like continuous processing, cocrystallisation, nanocrystallisation and crystallisation into excipient matrices



NEXT GENERATION DRUG MANUFACTURE

Advanced Biopharmaceutical Technologies  
€1 Million

**2013-2019**  
MOLECULE, MATERIAL, MEDICINE

- €40 MILLION from SFI & Industry
- 22 Industry Partners
- 9 Research Performing Organisations
- 12 International Academic Collaborators
- 19 Research Projects
- 28 Principal Investigators
- 30 Post-Doctoral Researchers
- 60 PhD Candidates
- 260 Members

Synthesis and Solid State Pharmaceutical Centre



**SERVICES/FACILITIES**

- Access to facilities and equipment in each of the 8 academic partner institutions.
- Access to partner company facilities including kilo labs, pilot plants, and analytical equipment including in-situ PAT systems.



EU Horizon 2020 is a significant opportunity for the SSPC to grow links academically and industrially throughout Europe. The SSPC has developed a strategy for engagement with this programme, which will attain over €20m in additional funding to the centre over its lifetime.

**CONTINUOUS PROCESSING WORKSHOP**  
NOVEMBER 2013



**FACTORY OF THE FUTURE**

- Academia-Industry Collaboration
- 80 Leading Scientists and Engineers from Industry and Academia

**FUTURE CONFERENCES:**  
PAT in Continuous Processes  
JUNE 2015

**MEDICINE:**  
DRUG PRODUCT FORMULATION & MANUFACTURE

REDUCING DRUG MANUFACTURING COSTS



The focus is on bringing stronger scientific and process engineering principles and knowledge into the domain of Solid State Pharmaceuticals, which up to now has essentially been empiric. This improved approach is demanded by the Quality by Design (QbD) knowledge based approach to develop new products and formulations.

**MAJOR THEMES INCLUDE:**

- Understanding the nature and strength of interactions between APIs and excipients
- Identification of currently unknown critical attributes in APIs and excipients that lead to failures during formulation
- Development of new materials and technologies for the generation and stabilisation of the amorphous state, which is one approach to realising the potential of BSC Class II poorly soluble drugs

RESEARCH PERFORMING ORGANISATIONS:



INDUSTRY PARTNERS:

