School of Pharmacy and Pharmaceutical Sciences: Research

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04/02/2015
RESEARCH THEMES

- New Drugs: *de novo* synthesis or from nature
- Disease, Drug Mechanisms & Safety
- Cancer Research
- Pharmaceutics & Pharmaceutical Technology
- Clinical Pharmacy & Pharmacy Practice

- **Solvotrin Therapeutics**
- **TRINO THERAPEUTICS**

Trinity College Dublin, The University of Dublin
New Drugs: *de Novo* Synthesis or from Natural Products

**De Novo Synthesis**

- Design, synthesis and evaluation of molecular structures as potential anti-cancer drugs
- Pro-drug optimisation of our current candidates
- Dual targeting drugs *e.g.* ER/aromatase, tubulin/aromatase
- Design of multi-drug resistance modulators

**From Natural products**

- Anti-cancer lead discovery from natural sources
- Ethno-medicine & evidence-based traditional Chinese medicine
- Cross-hybridisation of natural molecules as anti-cancer scaffolds
Disease, Drug Mechanism & Safety

» Platelet pathology and pharmacology of anti-platelet drugs

» Nanopharmacology

» Nanotoxicology

} soluble & surface-bound nanoparticles

» Pathophysiology and experimental therapeutics of inflammatory diseases

» Drug efficacy, toxicity & ADR evaluation
Cancer Research

- Target identification & validation
- Anti-cancer drug development
- Re-purposing “old” drugs
- Molecular mechanisms: cancer development & drug resistance
- Diagnostic, prognostic & drug-companion biomarkers
- Exosomes & platelets in cancer angiogenesis, metastasis, drug-resistance
- Nano-delivery of anti-cancer agents
- Pharmaco-kinetics & -dynamics of anti-cancer drugs
- Clinical trials design & development: Phase I & II

Phase I: “Basic” *in vitro* screening +/-chemo +/-targeted

Phase II “Advanced” *In Vitro* Screening

In Vivo Studies

Translational Clinical Trials (Phase I&II)
Design, production and evaluation of advanced drug delivery systems

Optimisation of formulations for poorly soluble drugs

Advancing conventional formulation & manufacturing of solid dosage form medicinal products

Nano-sized delivery systems for small and macro-molecules

Pharmaceutical salts and cocrystals

Formulation of lipid-based delivery systems

Identification of absorption pathways

Pulmonary drug delivery

Drug disposition after pulmonary administration

Drug-transporter interactions

Dissolution testing and simulation

Particle engineering by spray drying for pulmonary delivery

Epithelial cells for drug absorption studies
Clinical Pharmacy & Pharmacy Practice

- Clinical pharmacy & pharmaceutical care of vulnerable groups
- Pharmacy practice, medication use and patient safety
- Health services research & evidence-based practice
- Clinical pharmacokinetics-pharmacodynamic:
  - patient- & disease-related effects on distribution/elimination
- Pharmaco-epidemiology, pharmaco-economics & pharmaco-vigilance
- Healthcare law, regulation & professional ethics in pharmacy practice
- Educational research, workplace learning & technology-enhanced learning

Health Policy, Regulation & Population health
Professional education & training
Pharmaceutical care for vulnerable patient groups
Optimise medication use
Primary & secondary care pharmacy