Pharmaceutical Innovation and Development Group (PIDG)

Your Partner in Translational Pharmaceutical Research

University of South Australia

Our Enterprising Research Approach

Research inspired by

- challenges and opportunities
- partnered with end-users and communities, and
- underpinned by excellence

Our initiatives are focused on real world impact, entrepreneurship and commercialization, through an interdisciplinary approach to research and research outcomes

Why Work With PIDG?

Industrial Engagement

Our industry engagement is tailored to each collaborator with agreed intellectual property (IP) arrangement. PIDG team specialises in partnerships for generating funding under the joint industry-academia programs e.g., ARC Linkage and CRC programs. Involving research students is a good professional contribution and lowers operating costs.

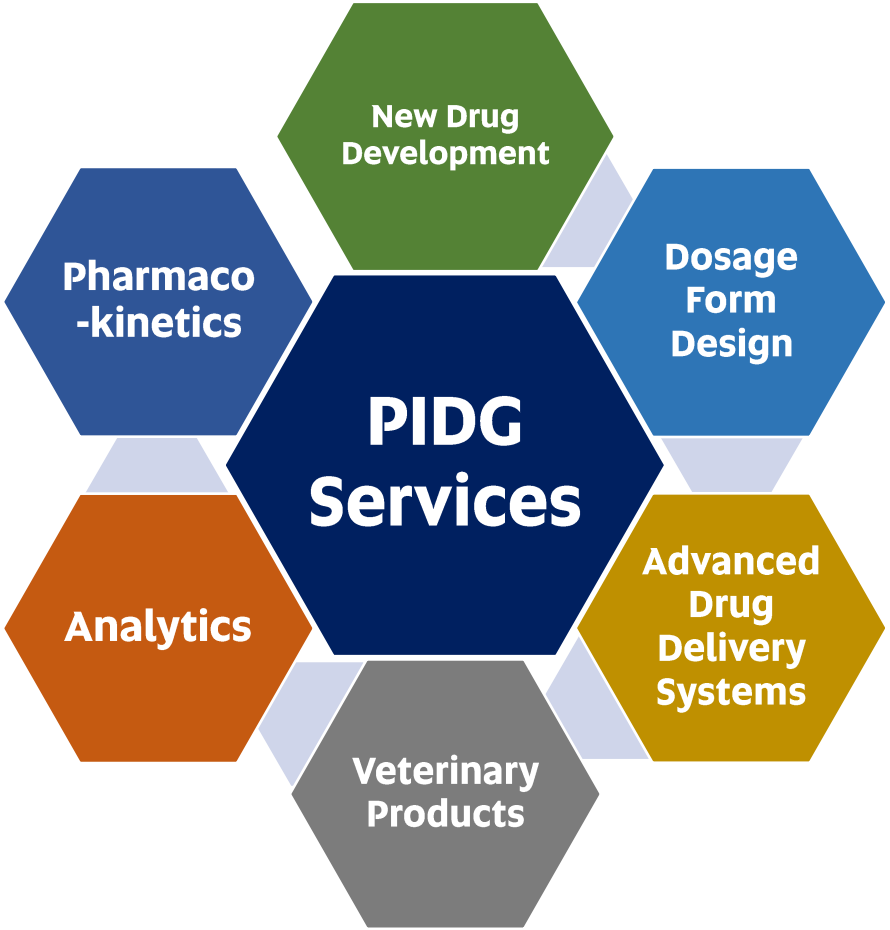
PIDG Advantages

- ❑ Agile and high-skilled team
- ❑ Dedicated Project Manager
- ❑ Specialist facilities
- ❑ Individualised service
- ❑ Customised IP arrangement
- ❑ Flexible service fee arrangement
- ❑ Joint industry-academia programs
- ❑ Up to 43.4% cashback for R&D expenses

Research Facilities

PIDG located in new $247 million, 14-storey UniSA Bradley Building

PIDG is located in the new purpose-built Bradley Building in City West Adelaide. The labs are well equipped with small and pilot-scale pharmaceutical development, analysis and characterization equipment for various dosage forms


New Drug Development
Pharmaco -kinetics
Dosage Form Design
PIDG Services
Analytics
Advanced Drug Delivery Systems
Veterinary Products

Our Services

PIDG offers a range of services to human and veterinary pharmaceutical, biotechnological, complementary, nutrition, aquaculture and cosmetics companies. We deliver customised R&D solutions for all stages of the product life cycle.

Drug Development

New Drug Development:

- Preformulation:
  - Solubility and stability assessment and enhancement
  - Solid-state characterization
  - Polymorphism
- Preclinical and clinical drug development
- Formulations supplies for in-vitro, ex-vivo, and in-vivo safety and efficacy studies
- Pharmacokinetics studies
- Process optimisation and validation
- Scale-up and Technology transfer

Dosage Form Design:

- Conventional dosage forms including solid (tablets, capsules, beads), semi-solid (gel, cream, ointment, paste, suppositories) and liquid (solution, suspension, emulsions)
- Novel dosage forms
  - Modified release: Fast acting, long-acting, pulsed, sustained, delayed, and enteric
  - Improvement of physicochemical characteristics e.g. solubility, stability, metabolism, permeability, bioavailability and taste

Our Services

Drug Development

Advanced Delivery Systems:

- Nanotechnology: Mesoporous silica nanoparticles, liposomes, micelles, polymeric nanoparticles, lipid nanoparticles, nanoemulsion, nanocrystals, nanosuspension
- Coating and Encapsulation: conventional pan coating, Fluid bed coating, spray dryer, dip coating, extrusion/spheronisation
- Novel drug delivery systems: Solid dispersion, films, implants, lipid suspension, microparticles, microcapsules, microspheres, pellets, in-situ gel, co-solvent, coated stents
- Drug loaded medical devices
- 3D printing technology for precision therapy

Veterinary Delivery Systems:

Dosage forms for dogs, cats, fish, horses, cattle, pig, and other animals

- Intramammary delivery systems
- Semi-solid topical formulations
- Modified release pellets
- Long-acting injectables
- Sustained-release otic formulation
- Suppositories
- Single-layer and bilayer tablets
- Palatable oral formulations
- Drug loaded feed and pour-on

Our Services

Analysis

PIDG provides the full spectrum of quality control and analytical capabilities, fully customisable for your specific application.

- Analytical method development and validation
- Release studies
- Stability studies
- Physical and chemical characteristics
- Complex bioanalytical method development and validation
- Quantitation of test compounds (pure and metabolites) in biological samples (plasma, blood, urine, tissues)
- Quality control check for API and finished products
- Stability indicating analytical method
- Degradation chemistry
- Transfer of analytical procedures

Pharmacokinetics

Pharmacokinetics (PK) Studies determine drug behaviour in the body and facilitate critical decision making on drug dosage and safety. PIDG offers full-spectrum service including

- Protocol design
- Ethics application
- Conduct study using mice or Rat model
- Generate the PK sample analysis data using a fully validated bioanalytical assay to evaluate relevant PK parameters such as bioavailability, distribution, metabolism, and clearance

Ongoing Projects

Cancer Drug Targeting:
both local and systemic delivery approaches

- 3D Printing technology for drug targeting
- Oesophageal and colonic stents as the vehicles for delivering single and the combination of drugs
- Intracellular drug targeting using monocytes specific polymers
- Novel drug-loaded site-specific and responsive hydrogel for colon cancer
- Actively deliver anticancer agents to breast tumours, by functionalizing drug-loaded and pH-responsive mesoporous silica nanoparticles with targeting ligands

Novel Antimicrobial Compounds and Formulations: human and veterinary applications:

- Preclinical development of new drug candidates with activity against resistant pathogens.
- Investigate the role of pH in wound healing and design of novel pH-responsive wound healing systems
- New therapeutics for wound repair using nano-technology
- New therapeutics for Acne
- Novel antimicrobial and anti-giardia formulations

Ongoing Projects

Veterinary Delivery Systems:
for cattle, horses, pigs, cats, dogs, fish and other animals:

- An innovative long-acting injectable IM formulation for the treatment of equine gastric ulcer
- Antimicrobial formulation for mastitis
- Sustained-release formulation for canine otitis infections
- Oral paste formulations for horses
- Delivery systems for use in the pork industry
- Taste masking of drugs used in aquaculture

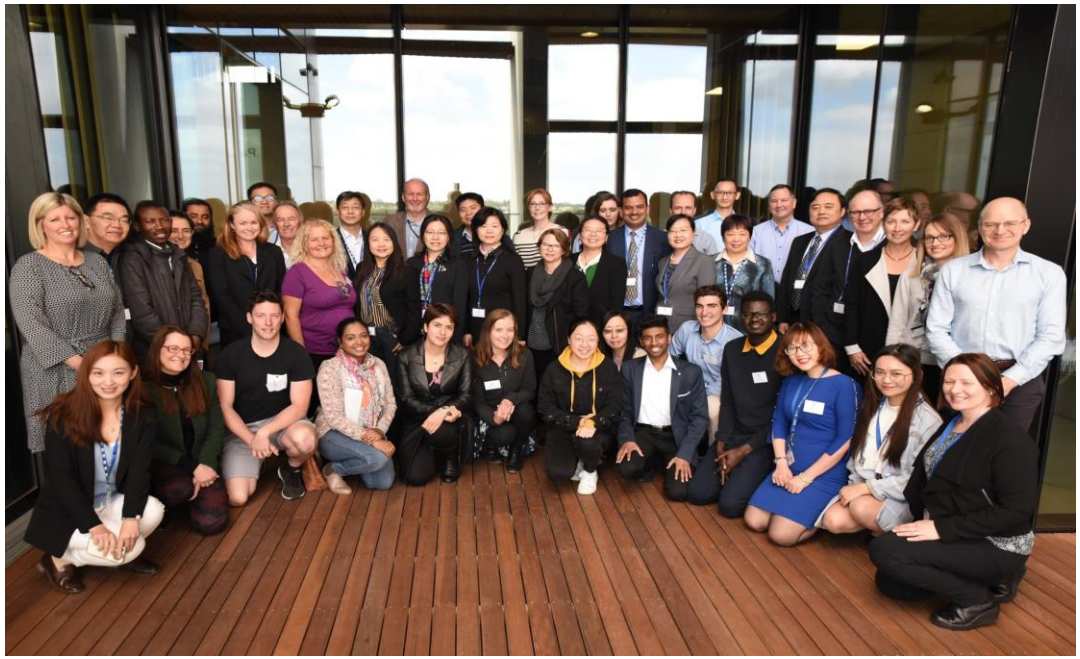
Patient-centric projects that benefit patients directly and are at the crossroads of pharmacy practice and science:

- New technologies to improve patient adherence, especially in Alzheimer's Disease, psychosis and infectious diseases using 3D printing and lipid-based formulation strategies
- New technologies for contraception
- Extemporaneous compounding stability and product development, in collaboration with local hospitals
- Bioanalysis of drugs in human milk

Our Industrial Partners

- Yaso Pharma, USA
- Bova Australia
- Bova UK
- Cleanseas, Australia
- Evofem, USA
- GD Pharma, Australia
- Luoda Pharma, Australia
- Mayne Pharma, Australia
- Neoculi Pty Limited, Australia
- Noxopharm Ltd, Australia
- Rezolve Scientific, Australia
- Separation Science, USA
- Sirtex Medical, Australia
- Sunpork Farm Supplies, Australia
- Vaxine, Australia
- Labskin, UK

Training



Sixth joint symposium of China Australia Centre of Health Science Research

In addition to Pharmaceutical research, PIDG offers specialised training programmes and has organised joint symposia on HPLC, LC/MS, and formulation Laboratory skills. Tailor-made training programmes can be arranged to suit special requirements. Following are some options:

- Summer vacation scholarship program
- Industrial placement program
- Honours degree program
- Visiting scholar program for research students
- APR Internship

How We Handle Projects?

- Initial enquiries and discussion
- Evaluation of feasibility, study proposal and quote submission
- Project scoping and contract
- Project Initiated
- Reports and archiving

Contact us

Professor Sanjay Garg

Director, PIDG

University of South Australia

UniSA Clinical and Health Sciences

Bradley Building, City West Campus

Phone: +61 4 7858 9728

Email: Sanjay.Garg@unisa.edu.au