

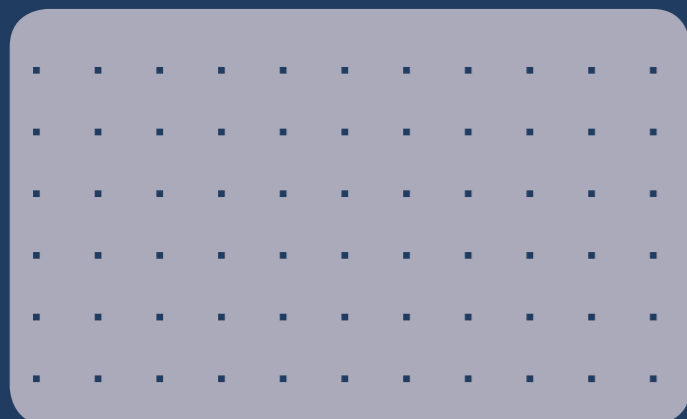
IRL Carbohydrate Chemistry have partners to ensure a seamless service. That means steering your pharmaceutical ingredients and small molecule drugs through each stage of the development process. From discovery through to large-scale manufacture.



—○ If you're not already engaged with us, do it today – **you'll be impressed.**

We have a long-term commitment to provide excellence in chemistry services to our clients and partners worldwide.

—○ How to make contact with us



or email:  
industry@irl.cri.nz

www.irl.cri.nz



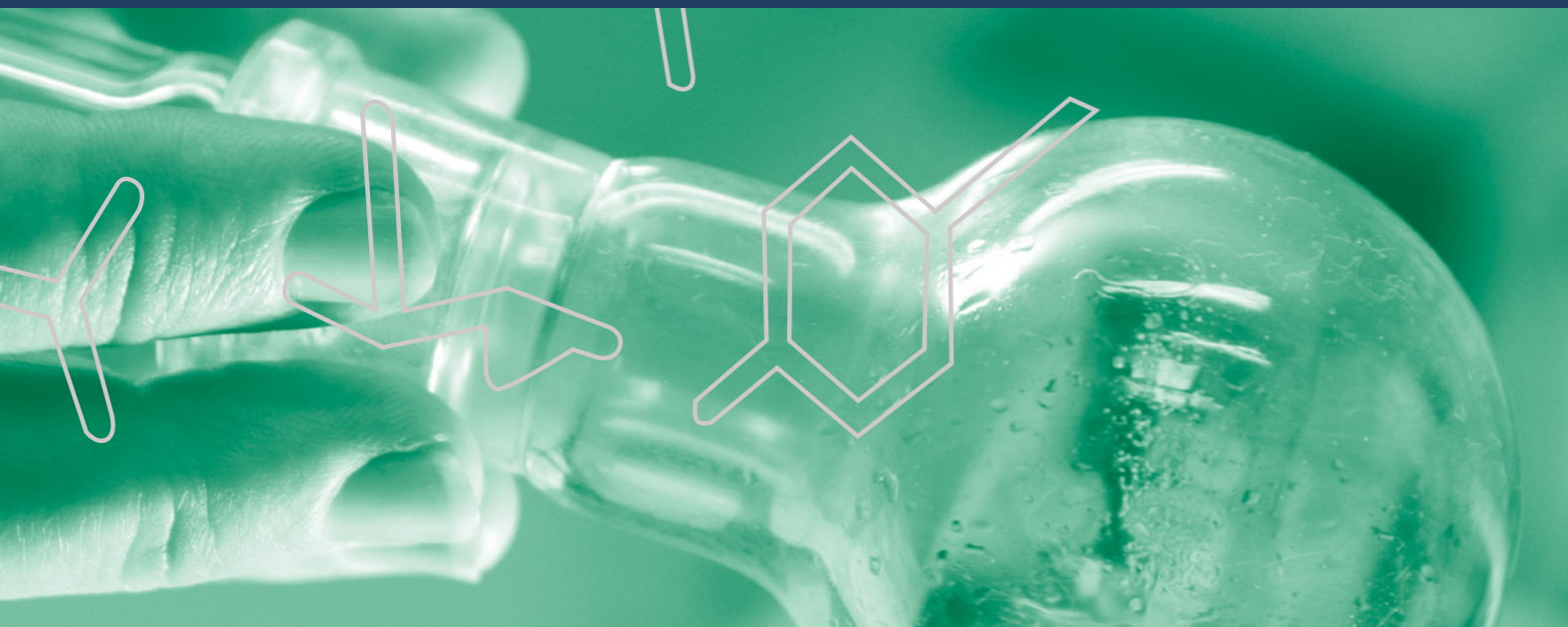
# Carbohydrate Chemistry

## CAPABILITY & SERVICE

High quality, fast-paced commercial discovery and bench-level synthesis of organic compounds

INDUSTRIALRESEARCH LIMITED





## What services do we offer?

### Contract R&D

The design and implementation of multi-step organic chemical syntheses to make one or a small set of small molecules (MW <1000 Daltons). As the client, you may be able to provide limited experimental methodology, or none at all, and the target structures may be defined or part of a proposed set of previously unreported structures.

### Laboratory contract synthesis

Production milligram-to-gram quantities of small molecules (MW <1000 Daltons) by multi-step organic chemical synthesis. Synthetic methods can be:

- taken from published papers, or
- client-provided recipes, or
- developed by IRL for the client.

### Process development

The adaptation of laboratory-scale multi-step organic chemical synthesis procedures for use in the production of multi-kilogram batches, either under cGMP or non-GMP manufacturing conditions.

### Contract processing

The production by multi-step organic chemical synthesis of 500 gram to 5 kilogram batches of materials using client-provided methodology, under non-cGMP conditions.

### Web sales – fine chemicals

An online catalogue of organic chemicals with known utility, available in specified quantities and at specified prices at [www.glycofinechem.com](http://www.glycofinechem.com). Products are primarily from the carbohydrate area and either rare or more expensive when obtained from alternative suppliers.

## What are our skills?

### Discovery chemistry – inhibitors

- Design of transition state inhibitors based on electronic blueprint
- Immucillin-H (Fodosine, an anti-cancer drug) synthesised in 21 linear steps
- New antimalarial drug candidates

### Medicinal chemistry

- Analogues of a psoriasis drug (BCX4208, BioCryst/Roche) to exemplify patent
- Analogues of an exquisitely potent inhibitor to find optimal inhibition for five microbial enzymes
- Analogues of glycolipids for patent exemplification
- Nucleoside mimics in search of inhibitors of an enzyme active in metastatic cancer
- Aza-sugar glycosidase inhibitors - kifunensine, castanospermine, deoxynojirimycin

### Route development

- Convergent synthesis of Fodosine - now utilised on multi-kilogram scale
- New route to chiral pyrrolidine - now utilised on multi-kilogram scale to make psoriasis drug candidate BCX-4208

### Dendrimer chemistry

- Polylysine dendrimers made as single chemical entities
- Analytical techniques developed for dendrimers
- Glycodendrimers for targeting dendritic cells

### Inositol chemistry

- Synthetic phosphatidyl-inositols mannosides for allergic disease, adjuvants
- Inositol phosphates
- Inologic INO4995 - cystic fibrosis drug candidate
- Chiro-inositol-based chiral hydrogenation catalysts
- Inositol analogues as diabetes drug candidates

### Target identification

- Structural characterisation of complex natural carbohydrates
- NMR, constituent sugar and methylation analyses, preparative HPAEC
- Mycobacterial phosphatidyl-inositol mannosides
- Heparan sulfate
- Natural polysaccharides – plant, algal, animal

### Chiral scaffolds

- Novel pyrrolidines for library construction

### Steroidal glycosides

- Glycosidation

### Oligosaccharide synthesis

- Branched manno-oligos
- Heparan sulfate oligos
- Enzymic synthesis

### Enzymes in synthesis

- Glycosidases
- Lipases
- Glucuronosyl transferase

### Non-carbohydrate chemistry

- Terpenoids – antibacterial totarol analogues
- Anticancer and anti-HIV compounds for NCI
- Luciferin
- Enzyme substrates
- Steroid conjugates
- Pheromones

... In short you get focussed outcomes at a lower cost and a faster return. ...

## What does this mean for you?

IRL Carbohydrate Chemistry has over 30 PhD chemists who specialise in the rational design and synthesis of carbohydrate drug candidates and in the isolation of natural products in partnership with our biotechnology clients around the globe.

We will meet all your custom synthesis needs at a very competitive rate. Our relationship with GlycoSyn and New Zealand suppliers seamlessly transitions our top quality bench-scale synthesis to multi-kilogram and cGMP manufacture.

