



CENTRE FOR PAIN RESEARCH

PROFESSOR DAVID CRAIK

Professor Craik's research centres on the applications of peptide chemistry and NMR in drug design and development. In particular, he focuses on discovery and applications of naturally occurring disulfide-rich peptides from plants and animals and uses peptide chemistry to re-engineer these molecules for applications in the treatment of pain. His group was the first to develop an orally active conotoxin-based drug lead for neuropathic pain.



RESEARCH APPROACHES

Professor Craik has a large research group (>30), with expertise in peptide synthesis, structural biology, bioassay and pharmacokinetics. Facilities available in the group include:

- peptide synthesis using Boc and Fmoc chemistry (three automated peptide synthesizers)
- peptide purification and characterisation (12 x HPLC and mass spec)
- structure determination of peptides using NMR spectroscopy (500, 600 and 900 MHz NMR)
- chronic constriction injury model for neuropathic pain in rats
- bioanalytical and stability assays including haemolysis, serum stability and gastric fluid stability
- pharmacokinetic analysis.

KEY PUBLICATIONS

Professor Craik is the author of 540 publications in refereed journals (h-index=67; citations ~17,000). Selected recent publications relevant to pain include:

Clark RJ, Jensen J, Nevin ST, Callaghan BP, Adams DJ, **Craik DJ** (2010) The engineering of an orally active conotoxin for the treatment of neuropathic pain. *Angewandte Chemie* **49**: 6545-6548.

Daly NL, **Craik DJ** (2011) Conopeptides as novel options for pain management. *Drugs of the Future* **36**: 25-32.

Craik DJ, Fairlie DP, Liras S, Price D (2103) The future of peptide-based drugs. *Chemical Biology & Drug Design* **81**: 136-147.

Craik DJ, Schroeder CI (2013) Peptides from mamba venoms as pain killers. *Angewandte Chemie* **52**: 3071-3073.

Wang CK, King GK, Northfield SE, Ojeda, P **Craik DJ**. Racemic and quasi-racemic X-ray structures of cyclic disulfide-rich peptide drug scaffolds: looking into the mirror for drug design. *Angewandte Chemie* (in press).

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