

Regulation of hormone levels associated with disease states in higher organisms

There are several projects in this area, involving producing enzyme inhibitors to down-regulate, and prohormones to up-regulate, the biosynthesis of peptide hormones. The synthesis and potential of these compounds as pharmaceutical agents for treating human and animal disease states associated with hormone imbalances will be investigated.

Supramolecular chemistry and molecular recognition

This research involves the design and synthesis of molecular machines such as molecular ratchets, shuttles, tweezers, switches, pistons and muscles, as the building blocks of nanotechnological devices.

Free radical reactions of amino acids, peptides and proteins

The aim of this project is to study free radical reactions of amino acids and their derivatives that are involved in many metabolic processes and associated with numerous physiological disorders, such as Alzheimer's disease and heart disease. The objectives of the work are to develop a better understanding of the biochemical reactions, produce new drugs, and develop efficient synthetic methods.

Enzyme catalysis of non-biological reactions

This project involves developing enzymes to catalyse non-biological reactions, such as cycloadditions, by designing non-natural substrates that bind to an enzyme with the correct alignment and close proximity of the reacting groups for catalysis to occur.

Novel amino resins

The objective of this project is to design and synthesise novel amino monomers, for incorporation into thermosetting resins in order to enhance resin characteristics such as solubility, flexibility and strength. These resins are used as the binder in reconstituted wood products, such as particleboard and fibreboard.

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For more detail on each of these projects see:

<http://rsc.anu.edu.au/~eastongrp/>