

# RESEARCH DIRECTIONS

## Green purification process

**Associate Professor Gary Dennis and Professor Andrew Shalliker from the School of Science and Health with David Shock from Phenomenex Australia Pty. Ltd., have been awarded a UWS Research Partnership grant to develop a "green" purification process for pharmaceuticals.**

'Our society relies on the ready availability of pharmaceuticals and other high purity speciality fine chemicals,' says Associate Professor Dennis. 'Both require separation of the high value active components from impurities. Ironically, these separations generate large quantities of harmful wastes, and the consumption of large quantities of energy. UWS and Phenomenex will develop a "green" purification process using carbon dioxide i.e. which is an excellent solvent, a cheap waste product, non-toxic, and the separated compounds can be recovered by simple evaporation. We will design and develop this important new technology.'

The research team will undertake the testing of current commercially available separation media. From the understanding gained of the separation performance the design will be optimised. From this pilot scale study, the carbon trading and ecological footprint of these processes will be calculated and compared to comparable conventional high performance liquid chromatography, which is a very powerful technique used for separation of the components of a mixture and it is the most widely employed technique for analysis and purification. They will then review and plan future directions for extension of this technology under the theme of 'green separations for a sustainable future'.



Key outcomes from this research will be the establishment of environmentally friendly purification processes, synthesis and testing of new separation media, and new separation technology incorporating highly specialized supercritical fluid chromatography systems. This will comprehensively establish whether preparative supercritical fluid chromatography is a viable 'green' approach to industrial purifications.

**Project Title:** Green Preparative Supercritical-Fluid Separations

**Funding has been set at:** \$30,000

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