



# New biotechnologies for enhancing carbon capture in leaf chloroplasts

Wednesday 10 April 2013, 1pm

**Associate Professor Spencer Whitney** Division of Plant Science, RSB

**Slatyer Seminar Room** R.N. Robertson Building (Bldg. 46), Linnaeus Way, ANU



The rate of photosynthetic carbon assimilation in plants is often limited by the catalytic rate of the CO<sub>2</sub>-fixing enzyme Rubisco. In nature there is significant natural diversity in catalytic performance of different Rubisco isoforms. Identifying the sequence elements in better performing Rubiscos that can be sculpted into the Rubisco of agricultural plants to improve their catalysis is a significant, longstanding challenge.

Prime among the challenges of manipulating Rubisco in leaf chloroplasts are (1) complying with the complex pathway for correctly assembling the eight large (L) and eight small (S) subunits of Rubisco; (2) conforming with the highly specific folding/assembly requirements that often prevent assembly of mutated or heterologous Rubisco subunits and (3) overcoming complexities associated with effectively engineering changes to both subunits given the disparate locations of the *rbcL* gene (plastome) and multiple *RbcS* genes (nucleus).

The feasibility of engineering improvements to Rubisco catalysis in plant chloroplasts has really only begun to advance at an

appreciable pace over the last 15 years with the development of versatile experimental technologies such as plastome transformation. These advances have allowed for the testing and identifying of performance changing modifications to higher plant Rubisco and the testing of their influence on photosynthesis and plant growth. In this talk I will introduce some of my groups' new experimental tools for faster structure-function studies of Rubisco in leaf chloroplasts.

Presented by

Research School of  
Biology

ANU College of  
**Medicine, Biology  
& Environment**

Contact details

E [adam.caroll@anu.edu.au](mailto:adam.caroll@anu.edu.au) T 02 612 56960

This lecture is free and open to the public

Plant Science Seminar Series information:  
[biology.anu.edu.au/News/Events.php](http://biology.anu.edu.au/News/Events.php)

CRICOS# 00120C