



# PhD exit seminar: Exploring novel *in planta* and *in vitro* approaches for bioengineering Rubisco

**Tuesday 8 April 1pm – 2pm**

## Speaker

**Laura Gunn**

PhD student, Whitney Lab, PS

## Location

**Slatyer Seminar Room**

R.N. Robertson Building (Bldg. 46),  
Linnaeus Way, ANU

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This lecture is free and open to the public

PSS event information:

[biology.anu.edu.au/News/events-ps.php](http://biology.anu.edu.au/News/events-ps.php)



The CO<sub>2</sub>-fixing enzyme ribulose-1,5-bisphosphate carboxylase/oxygenase (Rubisco) represents the major point of carbon entry into the biosphere. Despite millions of years of evolution, Rubisco is considered an inefficient enzyme exhibiting poor substrate specificity and a low catalytic turnover rate such that Rubisco catalysis often limits plant growth. Furthermore, photosynthetic carbon assimilation can be light-limited, which is particularly apparent in the plant's lower canopy. Engineering strategies to modify higher plant L<sub>8</sub>S<sub>8</sub> Rubisco, comprised of eight large- (LSu, plastome-synthesised) and eight small- (SSu, cytosol-synthesised)

subunits, are complicated by synthesis of its subunits within distinct sub-cellular locations and the number of interaction partners and strict regulation required for correct folding/assembly of cognate subunits within the context of the higher plant plastid. In this study a number of techniques were employed to determine the feasibility of several complementary Rubisco engineering pathways to improve the photosynthetic capacity and growth of higher plants. The experimental undertakings of this thesis provide vital insight into the future challenges for bioengineering Rubisco in leaf chloroplasts to modulate plant photosynthesis and growth.

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