Australian National University

PUBLIC LECTURE

Plant Rubisco biogenesis

Wednesday 12 September 2012 1pm

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Slatyer Seminar Room R. N. Robertson Building, Bldg 46, Linnaeus Rd, ANU

A study of the requirements and processing steps during co- and post-translational modification of the large subunit.

The co- and post-translational modification of proteins during maturation is an almost ubiquitous process which has long been observed to be essential for protein regulation, activation, and degradation in a large range of organisms. In higher plant chloroplasts assembly of the photosynthetic CO_2-fixing enzyme, Rubisco, is a highly complex process that necessitates the co-ordinated expression and assembly of its 8 large (L) and 8 small (S) subunits into a hexadecamer (L_8S_8). The L subunits house the catalytic sites and are subject to the co-translational aminopeptidase removal of Met-1 and Ser-2, and the acetylation of the new N-terminal Pro-3. The L subunit also undergoes a species specific tri-methylation modification. The function of these modifications is undefined. The L-subunit gene (*rbc*L) is located in the chloroplast genome (plastome) and can be genetically manipulated in tobacco with surgical precision via the homologous recombinatorial method of plastome transformation. I have generated transplastomic tobacco lines containing mutations at the 5'end of *rbc*L that cause changes in the N-terminal processing of the mutant L-subunits. These mutations have also impacted *rbc*L translation and subsequently Rubisco content, and highlight the importance of the 5'*rbc*L coding sequence for Rubisco biogenesis. Presented will be data on how these alterations in N-terminal processing influence leaf L-subunit translation, Rubisco content and the growth of these transgenic tobacco lines.

Presented by

Division of Plant Science
Research School of Biology
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