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# Control of root architecture through modulation of long distance auxin transport

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



While all higher plants form lateral roots, only a few families of plants develop root nodules in symbiosis with nitrogen-fixing bacteria. The evolution of this symbiosis is much more recent than the existence of lateral roots, suggesting that nodulation has co-opted regulatory pathways from lateral root formation. Nodules and lateral roots are both under control of nutrient supply, but how their architecture is regulated in response to nutrients is unclear. We tested whether a gene regulating nodule number in *Medicago truncatula*, SUNN (Super Numeric Nodules), is involved in root architecture responses to carbon and nitrogen and whether this is mediated by changes in shoot-to-root auxin transport. We found previously that this long distance transport of auxin is one determinant of nodule numbers under N limiting conditions by SUNN. The seminar will present evidence that SUNN is required for the modulation of shoot to root auxin transport in response to altered N tissue concentrations in the absence of rhizobia, and that this controls lateral root density in response to N. Control of nodule

density in response to N is more likely to occur locally in the root. Overall the results suggest that the SUNN gene is not just a gene controlling nodule numbers, but that it may have taken on a role during nodulation that originated from a function in lateral root development in response to nitrogen availability.

Presented by

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