

## NOVEL ALLELES OF *Medicago truncatula* AUTOREGULATION OF NODULATION MUTANT

**GHADA AHMED ABU EL-HEBA**

Department of Nucleic Acid and Protein Structure, Agricultural Genetic Engineering Research Institute (AGERI),  
Agricultural Research Center (ARC), Egypt

### ABSTRACT

Two new alleles of *Medicago truncatula*-Autoregulation of Nodulation (AON) mutants *sun* exhibited hyper-nodulation and shortened roots were discovered. The two mutant lines (NF2262&NF3306) contain tobacco Long Terminal Repeats (LTR) retrotransposon *Tnt1*-mobile element. *Tnt1*- insertion is precisely located at 462 bp and 406 bp upstream of ATG start codon in NF3306 and NF2262 respectively within *SUNN* gene. The two new independent mutant alleles relay under the *nitrogen-tolerant symbiosis* group (*nts*) similar to the previously described *sun* mutant. This hyper-nodulating phenotype is resulting from defective in the pathway of complex hormonal interaction. Since auxin and ethylene coordinated signals resulted in continuous root cells activity and elongation, different exogenous treatments were supplemented to growth media in attempts to elucidate the signals interaction complexity. While the minor concentration of Auxin 3- Indole Acetic Acid (IAA) enabled the two mutant lines to keep the shorter root length phenotype in comparing with R108, the higher concentration inhibited root growth in both mutant lines and R108. Data showed that the suppression ability of synthetic auxin transport inhibitor *N*-(1-naphthyl) phthalamic acid (NPA) had more negative influence on root elongation than IAA and it was notably that NPA strongly affects wild type than the two mutants. In the other hand, results indicated that root growth of *sun* mutant is completely unaffected by Ethylene precursor, 1-aminocyclopropane-1-carboxylic acid (ACC) in contrast with R108 which was strongly inhibited by adding 10 $\mu$ M of ACC than 0.1 $\mu$ M of ACC.

**KEYWORDS:** Leucine-Rich Repeat (LRR) Receptor Kinase, Super-Nodulation, *Sunn*, Phytohormones, Root Elongation, Auxin Transport