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### **The affects of genistein on the *Bradyrhizobium japonicum* bacterial transcriptome**

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*Bradyrhizobium japonicum* forms a symbiotic relationship with the roots of the soybean plant (*Glycine max*). This bacterium is of great importance because of its ability to provide the soybean with a source of nitrogen by the conversion of atmospheric dinitrogen to ammonia. In order to establish this symbiosis, the bacteria must attach to the root hair surface and initiate development of a root nodule. The bacterium responds to plant flavonoids through production of nod factor, a product of the nod genes, which facilitates bacterial root entry and initiates nodule organogenesis. Therefore, we have investigated the expression of nod genes after treatment with a plant derived flavonoid inducer, genistein. Free-living cultures of *Bradyrhizobium japonicum* were treated and cells were harvested six hours after treatment and total RNA was extracted. Semi-quantitative and quantitative RT-PCR was performed to confirm induction of the nodY and nodC genes. The RT-PCR results confirmed that nodY and nodC are upregulated in the presence of genistein compared to an ethanol-treated control. To further define genistein regulation on the nod genes, a DNA microarray experiment was performed on the above extracted RNA to define the bacterial transcriptional response to genistein, the results of which will be presented.