Table S1: Overview of nodulation genes identified by forward and/or reverse genetics. Lj: *Lotus japonicus*, Mt: *Medicago truncatula*, Ms: *Medicago sativa*; Gm: *Glycine max*, Ps: *Pisum sativum*; Pv: *Phaseolus vulgaris*, As: *Astragalus sinicus*, Ag: *Alnus glutinosa*, Cg: *Casuarina glauca*, Dg: *Datisca glomerata* and Pan: *Parasponia andersonii*.

| receptor complexes | gene name | description | symbiosis | references |
|--------------------|-----------|-------------|-----------|------------|
| LysM-RLK           | LjEPR3    | Exopolysaccharide receptor | -/Nod | (Kawaharada et al., 2015) |
| LysM-RLK           | MtLYK3, LjNFR1 | Rhizobium LCO receptor | AM/Nod | (Radutoiu et al., 2003; Limpens et al., 2003; Smit et al., 2007; Broghammer et al., 2012) |
| LysM-RLK           | LjNFRe    | Epidermis specific rhizobium LCO receptor | -/Nod | (Murakami et al., 2018) |
| LysM-RLK           | MtLYK9, LjCEK6, PsLYK9 | CO receptor | AM/- | (Bozsoki et al., 2017; Leppyanen et al., 2017; Gibelin-Viala et al., 2019) |
| LysM-RLK           | MtNFP, LjNFR5, PanNFP1 | Rhizobium LCO receptor | -/Nod | (Madsen et al., 2003; Arrighi et al., 2006; Op den Camp et al., 2011b; Broghammer et al., 2012) |
| LysM-RLK           | MtLYR3    | LCO receptor, induced in nodules | -/Nod | (Fliedmann et al., 2013; Fliedmann et al., 2016) |
| Flotilin           | MtFLOT2, MtFLOT4 | Scaffold of LysM-type LCO receptors, required for nodule formation and infection | -/Nod | (Haney and Long, 2010; Haney et al., 2011) |
| Rho-like Small GTPase | LjROP6 | Interacts with LjNFR5. Controls infection | -/Nod | (Ke et al., 2012) |
| NFR5-interacting cytoplasmic kinase | LjNiCK4 | Promotes nodule organogenesis | -/Nod | (Wong et al., 2019) |
| E3-ligase          | MtPUB1    | Interacts with MtLYK3, negative regulator | -/Nod | (Mbengue et al., 2010) |
| E3-ligase          | LjPUB13   | Interacts with LjNFR5, positive regulator | -/Nod | (Tsiko et al., 2018) |
| Symbiotic receptor kinase | MtDMI2, LjSYMIRK, MsNORK | LRR-RLK, essential for LCO signalling | AM/Nod | (Stracke et al., 2002; Endre et al., 2002) |
| SYMRK interacting protein HMGR | MtHMGR1 | 3-hydroxy-3-methylglutaryl coenzyme A reductase involved in mevalonate pathway | AM/Nod | (Kevei et al., 2007; Venkateshwaran et al., 2015) |
| SYMRK interacting protein SIP1 | LjSIP1 | ARID/BRIGHT DNA binding domain containing protein | -/Nod | (Zhu et al., 2008) |
| MAP kinase kinase  | LjSIP2    | Interacts with LjSYMIRK. | -/Nod | (Zhu et al., 2008; Chen et al., 2012) |
| **MAP kinase** | LjMPK6 | MAP kinase. Target of LjSIP2. Targets LjLHK1 | -/Nod | (Yin et al., 2019) |
| **E3-ligase** | LjSINA4 | Interacts with LjSYMRK, negative regulator of rhizobium infection. | -/Nod | (Den Herder et al., 2012) |
| **E3-ligase** | LjSIE3 | Interacts with LjSYMRK, involved in nodule formation | -/Nod | (Yuan et al., 2012) |
| **Lectin nucleotide phosphohydrolase** | LjLNK | Essential for LCO signalling | AM/Nod | (Yuan et al., 2012; Roberts et al., 2013) |
| **Nod factor hydrolase** | MtNFH1 | LCO hydrolase | -/AM | (Cai et al., 2018a) |
| **Nuclear signalling** | | | | |
| **Calcium-dependent protein kinase** | MtCPK3 | Controls nodulation efficiency | -/Nod | (Gargantini et al., 2006) |
| **Calcium ATP-ase** | MtMCA8 | Essential for LCO induced perinuclear calcium oscillations | AM/Nod | (Capoen et al., 2011) |
| **Cyclic nucleotide-gated Ca2+ channel** | MtCNGC15a, MtCNGC15b, MtCNGC15c | Essential for LCO induced perinuclear calcium oscillations | -/Nod | (Charpentier et al., 2016) |
| **Nucleoporin** | LjNUP85 | Essential for LCO induced perinuclear calcium oscillations | AM/Nod | (Saito et al., 2007) |
| **Nucleoporin** | LjNUP133 | Essential for LCO induced perinuclear calcium oscillations | AM/Nod | (Kanamori et al., 2006) |
| **Nucleoporin** | LjNENA | Essential for LCO induced perinuclear calcium oscillations | AM/Nod | (Groth et al., 2010) |
| **Potassium channel** | MtDMI1, LjPOLLUX | Essential for LCO signalling | AM/Nod | (Ané et al., 2004; Imaizumi-Anraku et al., 2005) |
| **Potassium channel** | LjCASTOR | Essential for LCO signalling | AM/Nod | (Imaizumi-Anraku et al., 2005) |
| **Calcium Calmodulin dependent kinase** | MtDMI3, LjCCAMK | Essential for LCO signalling | AM/Nod | (Mitra et al., 2004; Lévy et al., 2004; Tirichine et al., 2006) |
| **Transcriptional regulators** | | | | |
| **CYCLOPS transcription factor** | MtIPD3, LjCYCLOPS, MtIPD3L | Essential for LCO signalling. Interacts with CCaMK | -/Nod | (Messinese et al., 2007; Yano et al., 2008; Singh et al., 2014; Jin et al., 2018) |
| **NODULE INCEPTION transcription factor** | MtNIN, LjNIN, PsSYM35, CgNIN | Nodule Inception transcription factor, essential for nodule formation | -/Nod | (Schauser et al., 1999; Borisov et al., 2003; Marsh et al., 2007; Clavijo et al., 2015) |
| PROTEIN TYPE | RELEVANT PROTEIN(S) | FUNCTION(S) | DEVELOPMENTAL STAGE |
|-------------|---------------------|-------------|---------------------|
| NIN-LIKE PROTEIN | MtNL1, LjNRsym1 | Represses NIN upon physical interaction | -/Nod |
| Nuclear Factor YA transcription factor | MtNF-YA1, LjNF-YA1, P.vNF-YA1, MtNF-YA2, LjCBFA22, LjCBFA01 | Direct target of NIN, forms complex with NF-YB and NF-YC subunits. Essential for nodule development and infection | -/Nod |
| Nuclear Factor YB transcription factor | MtNF-YB16, LjNF-YB1, P.vNF-YB7 | Direct target NIN, forms complex with NF-YA and NF-YC subunits. | -/Nod |
| Nuclear Factor YC transcription factor | MtNF-YC1, MtNF-YC2 / P.vNF-YC1 | Involved in rhizobium infection and nodule development. Forms complex with NF-YA and NF-YB subunits. | -/Nod |
| AP2-ERF transcription factor | MtERN1, MtERN2 | Essential for nodule formation, and AM symbiosis | -/Nod |
| AP2-ERF transcription factor | LjERF1 | Involved in nodule formation | -/Nod |
| AP2-ERF transcription factor | MtEFD | Essential for nodule development | -/Nod |
| GRAS-type transcriptional regulator | MtNSP1, LjNSP1, PanNSP1 | Essential for nodule formation | -/Nod |
| GRAS-type transcriptional regulator | MtNSP2, LjNSP2, PanNSP2 | Essential for nodule formation | AM/Nod |
| GRAS-type transcriptional regulator | MtSymSCL1 | Role in nodule number regulation | -/Nod |
| bHLH transcription factor | GmHLHm1 (GmSAT1) | Essential for nodule functioning | AM/Nod |
| bHLH transcription factor | MtbHLH1 | Involved in nodule vasculature patterning | -/Nod |
| bHLH transcription factor | MtbHLH476 | Direct target of CRE1-dependent cytokinin signaling regulating nodulation | -/Nod |
| BOP-type transcriptional regulator | MtNoot1, Minoot2, LjNbc1, PsCOCH | Regulator of nodule development | -/Nod |
| aminopetidase P1 | LjAPP1 | Interactor of LjNbc1. Negative regulator of nodulation | -/Nod |
| Factor Type | Gene Symbol | Function | Literature |
|-------------|-------------|----------|------------|
| C2H2 transcripion factor | MsZPT2-1 | Regulator of nodule development | Frugier et al., 2000 |
| C2H2 transcripion factor | MtRSD | Regulator of symbiosome development | Sinharoy et al., 2013 |
| NAC transcripion factor | MtNAC969 | Antagonistically regulates root abiotic stress response and nodule senescence | De Zélicourt et al., 2012 |
| MYB transcripion factor | LjIPN2 | Interacting protein of NSP2 | Kang et al., 2014 |
| MYB transcripion factor | GmCND | Controls nodule Development | Libault et al., 2009 |
| MADS box transcripion factor | GmNMHC5 | Positive regulator of nodulation. Sucrose-responsive | Liu et al., 2015 |
| KNOX homeodomain transcription factor | MtKNOX3, MtKNOX4, MtKNOX5 | Functions in nodule differentiation | Azarakhsh et al., 2015; Di Giacomo et al., 2016 |
| WOX homeobox transcription factor | MtWOX5 | auxin responsive marker for nodule meristem. Acts upstream of systemic regulator NODULATION3 | Osipova et al., 2012 |
| bZIP transcription factor | LjASTRAY | negative regulator of nodule formation | Nishimura et al., 2002a |
| AP2 transcriptional repressor | GmNNC1 | negative regulator of nodule formation | Wang et al., 2014; Wang et al., 2019a |

**Infection related**

| Component | Gene Symbol | Function | Literature |
|-----------|-------------|----------|------------|
| LRR-tye RLK | LjRINK1 | Involved in infection thread formation | Li et al., 2019 |
| Actin-related protein component | LjARPC1 | ACTIN-RELATED PROTEIN COMPONENT1 essential for rhizobium infection | Hossain et al., 2012 |
| Annexin | MtANN1 | Induced during symbiotic associations; marker for pre-infection | de Carvalho Niebel et al., 1998; Niebel et al., 1998; De Carvalho-Niebel et al., 2002 |
| Cystathionine-β-Synthase | MtCBS1 | Required for rhizobium infection | Sinharoy et al., 2016 |
| Devil-type peptide | MtDVL | Controls nodulation | Combier et al., 2008 |
| Deubiquitinating enzyme | LjAMSH1 | Required for rhizobium infection and nodule organogenesis | Malolepszy et al., 2015 |
| DNA topoisomerase VI subunit A | LjSUNERGOS1 | Required for rhizobium infection | Yoon et al., 2014 |
| DNA topoisomerase VI RHL1 | LjVAG1 | Required for the ploidy-dependent cell growth of rhizobial-infected cells | -/Nod | (Suzaki et al., 2014) |
|--------------------------|--------|--------------------------------------------------------------------------------|--------|----------------------|
| E3 ubiquitin ligase       | MtLIN / LjCERBERUS | Essential for rhizobium infection | -/Nod | (Kiss et al., 2009; Yano et al., 2009) |
| Long coiled-coil protein  | MtRPG  | Essential for rhizobium infection | -/Nod | (Arrighi et al., 2008) |
| SCAR/WAVE protein         | MtNAP1 / LjNAP1 | Essential for rhizobium infection, involved in actin rearrangement or nucleation | -/Nod | (Yokota et al., 2009; Miyahara et al., 2010) |
| p53 inducible RNA         | LjPIR1 | Essential for rhizobium infection, involved in actin rearrangement or nucleation | -/Nod | (Yokota et al., 2009) |
| Pectate lyase             | LjNPL  | Essential for rhizobium infection | -/Nod | (Xie et al., 2012) |
| Peroxidase                | MtRIP1 | Rhizobium-induced peroxidase | -/Nod | (Cook et al., 1995; Ramu et al., 2002) |
| Rapid alkalization factor (RALF) peptide | MtRALF1 | Controls nodulation | -/Nod | (Combier et al., 2008) |
| Vapyrin                   | MtVPY  | Essential for rhizobium infection and arbuscule formation | AM/Nod | (Pumplin et al., 2010; Murray et al., 2011) |

### Nodule & symbiosome development

| Symbiosome localized esterase | MtENOD8 | Localized to symbiosome membrane. | -/Nod | (Coque et al., 2008) |
|-------------------------------|--------|----------------------------------|--------|----------------------|
| Early nodulin                | GmaENOD93, Dg93 | Nodule-induced. | -/Nod | (Kouchi and Hata, 1993; Okubara et al., 2000) |
| Ankyrin-repeat membrane protein | LjIGN1 | Membrane protein, required for persistence of nitrogen-fixation in nodules. | -/Nod | (Kumagai et al., 2007) |
| Methionine-rich membrane protein | LjSEN1, GmNOD21 | Legume-specific, exclusively expressed in infected nodule cells, essential for symbiosome differentiation. | -/Nod | (Delauney et al., 1990; Hakoyama et al., 2012a) |
| Small membrane localised protein | MtNAD1 | Required to repress defense responses in nodules. | -/Nod | (Wang et al., 2016) |
| Stress up-regulated Nod 19   | MtN19  | Nodule-induced, possible target of miR398b. | -/Nod | (Gamas et al., 1996) |
| Small peptide                | LjALOG | Controls nodulation efficiency. | -/Nod | (Lei et al., 2018) |
| Remorin          | MtSYMREM1, LjSYMREM1 | Symbiotic remorin, interact with SYMRK and LCO LysM-RK receptors. | AM/Nod | (Lefebvre et al., 2010; Tóth et al., 2012) |
|------------------|---------------------|---------------------------------------------------------------|--------|------------------------------------------|
| Signal peptidase | MtDNF1              | Required for symbiosome formation.                           | -/Nod  | (Wang et al., 2010)                     |
| Phosphatidylinositol phospholipase C-like | MtDNF2              | Required for bacteroid persistence.                          | -/Nod  | (Bourcy et al., 2013)                   |
| t-SNARE syntaxin | MtSYP132            | Gene encoding two splice variants, of which one is essential for symbiosome and arbuscule formation. | -/Nod  | (Catalano et al., 2007; Huisman et al., 2016; Pan et al., 2016) |
| v-SNARE syntaxin | LjSYP71             | Ambiguous expressed. Commits essential function in nodules   | -/Nod  | (Hakoyama et al., 2012b)               |
| v-SNARE syntaxin | MtVAMP721d, MtVAMP721e | Essential for symbiosome and arbuscule formation             | AM/Nod | (Ivanov et al., 2012)                  |

**Systemic signaling**

| CLV1-type LRR-receptor kinase | MtSUNN, LjHAR1, GmNARK | Systemic control of nodulation. | AM/Nod | (Krussel et al., 2002; Nishimura et al., 2002b; Searle et al., 2003; Schnabel et al., 2005; Müller et al., 2019) |
| CL1-type LRR-receptor kinase | LjKLV                | Systemic control of nodulation | -/Nod  | (Miyazawa et al., 2010)               |
| CLV2-type LRR-receptor       | LjCLV2 / PsSYM28      | Systemic control of nodulation | -/Nod  | (Krusell et al., 2011)               |
| CLE peptide                  | MtCLE12, MtCLE13      | Responsive to cytokinin, controls nodule development          | AM/Nod | (Mortier et al., 2010; Mortier et al., 2012; Müller et al., 2019) |
| CLE peptide                  | LjCLE-RS1, LjCLE-RS2  | Systemic control of nodulation, binds to LjHAR1               | -/Nod  | (Okamoto et al., 2009; Okamoto et al., 2013) |
| CLE peptide                  | GmRIC                | Systemic control of nodulation                                 | -/Nod  | (Ferguson et al., 2014)              |
| CEP peptide receptor         | MtCRA2               | Controls lateral root and nodule development                   | -/Nod  | (Mohd-Radzman et al., 2016)          |
| CEP peptide                  | MtCEP1               | Systemic control of nodulation                                 | -/Nod  | (Djordjevic et al., 2015; Mohd-Radzman et al., 2016) |
| Kelch repeat-containing F-box protein | LjTML           | Systemic control of nodulation, acts downstream of CLE-RS signalling | -/Nod  | (Takahara et al., 2013)             |
| Arabinosyl transferase       | MtRDN1, LjPLENTY, PsNOD3 | Systemic control of nodulation                                 | -/Nod  | (Yoshida et al., 2010; Schnabel et al., 2011) |
| Essential for ethylene mediated signalling | MtSKL1, LjEIN2-1, LjEIN2-2, PanEIN2 | Negative regulator of symbiotic and pathogenic microbial associations | -/Nod | (Penmetsa et al., 2008; Miyata et al., 2013; van Zeijl et al., 2018) |
|------------------------------------------|---------------------------------|-------------------------------------------------|--------|--------------------------------------------------|
| **Hormones**                             |                                 |                                                 |        |                                                  |
| Histidine kinase                         | MtCRE1 / LjHK1                  | Essential for nodule formation.                 | -/Nod  | (Gonzalez-Rizzo et al., 2006; Murray et al., 2007) |
| Cytokinin receptor                       |                                 |                                                  |        |                                                  |
| C3HC4-type RING finger protein            | LjCZF1                         | Interacts with LjLHK1, controls nodulation efficiency. | -/Nod  | (Cai et al., 2018b)                              |
| Isopentenytransferase                    | LjIPT3                          | Adenylate isopentenytransferase IPT3.           | AM/Nod | (Chen et al., 2014)                              |
| Cytokinin oxidase / dehydrogenase        | MtCKX1                          | Direct target of CRE1-dependent cytokinin signaling, regulating nodulation. | -/Nod  | (Ariel et al., 2012)                             |
| Cytokinin oxidase / dehydrogenase        | LjCKX3                          | Direct target of CRE1-dependent cytokinin signaling, regulating nodulation | -/Nod  | (Reid et al., 2016)                              |
| Cytokinin type-A Response Regulator      | MtRR4, MRR9, MfR11              | Responsive to cytokinin, control nodule development. | -/Nod  | (Op den Camp et al., 2011a; Ariel et al., 2012)  |
| Tryptophan Amino-transferase Related protein | LjTAR1                      | LCO responsive. Involved in auxin biosynthesis. | -/Nod  | (Nadzieja et al., 2018)                         |
| Carotene Hydroxylase                     | GmBCH1, GmBCH2, GmBCH3          | involved in nodule development                   | -/Nod  | (Kim et al., 2013)                               |
| Carotene isomerase                       | MtDWARF27                       | essential for strigolactone biosynthesis, LCO responsive | -/Nod  | (Liu et al., 2011; Van Zeijl et al., 2015)       |
| Carotenoid cleavage dioxygenase          | MtCCD7, LjCCD7                  | essential for strigolactone biosynthesis, involved in nodulation and mycorrhization | AM/Nod | (Liu et al., 2013; Van Zeijl et al., 2015)       |
| Carotenoid cleavage dioxygenase          | MtCCD8, PaRMS1                  | essential for strigolactone biosynthesis, involved in nodulation and mycorrhization | AM/Nod | (Gomez-Roldan et al., 2008; Foo and Davies, 2011; Foo et al., 2013; Breakspear et al., 2014) |
| Jasmonate-Zim-domain                     | AsJAZ1                          | Interacts with LB                                | -/Nod  | (Li et al., 2015)                                |
| Ammonium transporter                     | LjAMT1;1                        | Ammonium transporter 1, involved in nodule functioning | -/Nod  | (Rogato et al., 2008; Straub et al., 2014)       |
| Ammonium transporter                     | MtAMT1;3                        | Ammonium transporter 1; involved in nodule functioning | -/Nod  | (Straub et al., 2014)                           |
| Anion transporter | LjN70 / GmN70 | Localizes at symbiosome membrane of nodules and has transport preference for nitrate | -/Nod | (Vincill et al., 2005) |
| Aquaporin | MtAQP1, GmNOD26 | Expressed in infected nodule cells | AM/Nod | (Miao and Verma, 1993) |
| Divalent metal transporter | GmDMT1 | Nodule specific expression | -/Nod | (Kaiser et al., 2003) |
| Class 1 hemoglobin | PanHB1 | Class I hemoglobin, commits symbiotic function in Parasponia | -/Nod | (Appleby et al., 1983; Sturms et al., 2010; van Velzen et al., 2018) |
| Class 2 hemoglobin | LjLB1, LjLB2, LjLB3 | Class II symbiotic hemoglobins, essential for nodule functioning | -/Nod | (Ott et al., 2005; Wang et al., 2019b) |

| **Transporters** |  |  |  |  |
| Iron-activated citrate transporter | MtMATE67, LjMATE1, GmFRD3a, GmFRD3b | Required for nitrogen-fixation | -/Nod | (Takanashi et al., 2013; Kryvoruchko et al., 2018) |
| Nitrate transporter | MtNIP/LATD | Controls rhizobium infection and lateral root organ formation | -/Nod | (Bagchi et al., 2012) |
| Oligopeptide transporter | GmYSL1 | Involved in remobilization of iron from the nodule | -/Nod | (Brear et al., 2013) |
| Potassium transporter | LjKUP1 | Nodule specific expression | -/Nod | (Desbrosses et al., 2004) |
| Phosphate transporter | GmPT7 | Required for nodule formation | -/Nod | (Chen et al., 2019) |
| Sucrose transporter | MtSUT1-1 | Induced upon mycorrhization | AM/Nod | (Doidy et al., 2012) |
| Sucrose transporter | MtSUT4-1, LjSUT4 | Induced upon mycorrhization | AM/Nod | (Reinders et al., 2008; Doidy et al., 2012) |
| Sucrose transporter | MtSWEET11, MtSWEET12, LjSWEET3 | Nodule specific expression | -/Nod | (Kryvoruchko et al., 2016; Sugiyama et al., 2016) |
| Sulfate transporter | LjSST1 | Essential for nodule functioning | -/Nod | (Krusell et al., 2005) |
| Zinc transporter | GmZIP1 | Nodule specific expression | -/Nod | (Moreau et al., 2002; Krusell et al., 2005) |

| **Enzymes** |  |  |  |  |
| Carbonic anhydrase | MsCA1, LjCA1, GmCA1 | Nodule enhanced expression, catalyzes interconversion of CO2 and water to bicarbonate and protons | -/Nod | (Kavroulakis et al., 2000; Flometakis et al., 2003; Aivalakis et al., 2004) |
| Enzyme Type                   | Genes/Proteins                                           | Description                                                                                     | Location/Reference                                                                 |
|-------------------------------|----------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Cysteine protease             | LjCYP1, LjCYP2, LjCYP4, PsCYP15A                          | Involved in nodule and arbuscule senescence                                                    | AM/Nod (Goetting-Minesky and Mullin, 1994; Vincent and Brewin, 2000; Deguchi et al., 2007) |
| Glutamate synthase            | MtNADH-GOGAT, MsNADH-GOGAT                               | NADH-dependent glutamine oxoglutarate aminotransferase essential enzyme in nitrogen metabolism in nodules | -/Nod (Vance et al., 1995; Glevarec et al., 2004)                                   |
| Glutamine synthetase          | MtGS2                                                    | Plastid localized enzyme essential enzyme in nitrogen metabolism in nodules                   | -/Nod (Melo et al., 2003)                                                          |
| Glutamine synthetase          | GmGS1-2                                                  | Cytosolic enzyme essential enzyme in nitrogen metabolism in nodules                           | -/Nod (Guan et al., 1996; Morey et al., 2002)                                       |
| Glycinamide ribonucleotide synthetase | GmPURD                       | Nodule enhanced expression, enzyme acts in nitrogen metabolism                            | -/Nod (Schnorr et al., 1996)                                                        |
| Glycinamide ribonucleotide transformylase | GmPURN                        | Nodule enhanced expression, enzyme acts in nitrogen metabolism                            | -/Nod (Schnorr et al., 1996)                                                        |
| Homocitrurate synthase        | LjFEN1                                                    | Can compensate homocitrate deficient rhizobia in nodules                                     | -/Nod (Hakoyama et al., 2009b)                                                       |
| NADH-malate dehydrogenase     | MsMDH, GmMDH                                             | Involved in metabolism of malate                                                             | -/Nod (Miller et al., 1998; Imsande et al., 2001)                                  |
| NADPH oxidase                 | MtRBOHA, PvRBOHB                                         | Expressed in rhizobium containing nodule cells and arbusculated cells                         | AM/Nod (Marino et al., 2011; Montiel et al., 2012; Arthikala et al., 2014; Belmondo et al., 2016) |
| Nicotianamine synthase        | LjNAS2                                                   | Nodule specific expression                                                                  | -/Nod (Hakoyama et al., 2009a)                                                      |
| Phosphoenolpyruvate carboxylase | GmPEPC7                                  | Involved in metabolism of C4 dicarboxylic acids                                               | -/Nod (Nakagawa et al., 2003)                                                       |
| Subtilisin-like protease       | AgAG12, CgCG12                                           | Nodule enhanced expression                                                                  | AM/Nod (Ribeiro et al., 1995)                                                        |
| Subtilisin-like protease       | LjSBTS                                                   | Expression strongly enhanced in nodules and mycorrhizaed roots                                | AM/Nod (Kistner et al., 2005)                                                         |
| Sucrose synthase              | MtSUCS1, AglSUS1                                         | GT1 Sucrose synthase                                                                         | -/Nod (van Gheue et al., 1996; Hohnjec et al., 1999)                                |
| Uricase                       | GmNOD35                                                  | Essential enzyme in nitrogen metabolism in nodules                                           | -/Nod (Nguyen et al., 1985)                                                         |
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