

Stanford



Sharon R. Long

William C. Steere, Jr. - Pfizer Inc. Professor of Biological Sciences and Professor, by courtesy, of Biochemistry
Biology

Curriculum Vitae available Online

CONTACT INFORMATION

- **Alternate Contact**

Alex Bloom - Administrative Assistant

Email abloom@stanford.edu

Tel 650-723-2007

Bio

BIO

Sharon Long received her undergraduate degree from Caltech, and carried out her PhD studies at Yale, working with Ian Sussex on plant development. She was a postdoc with Fred Ausubel where she began study of rhizobia-legume symbioses. She joined the Stanford faculty in 1982.

ACADEMIC APPOINTMENTS

- Professor, Biology
- Professor (By courtesy), Biochemistry
- Member, Bio-X
- Faculty Fellow, Sarafan ChEM-H

ADMINISTRATIVE APPOINTMENTS

- Dean, Stanford School of Humanities and Sciences, (2001-2007)

HONORS AND AWARDS

- Lifetime Research Award, International Society for Plant-Microbe Interactions (2017)
- Fellow, American Society for Plant Biology (2007)
- Wilbur Cross Medal for graduate alumna/us, Yale University (2002)
- Fellow, American Philosophical Society (2000)
- Fellow, Association for Women in Science (1999)
- Distinguished Alumni Award, California Institute of Technology (1998)
- George Morel Memorial Fellowship, INRA, France (1998)
- Fellow, American Academy of Arts and Sciences (1994)
- Member, National Academy of Sciences (1993-)
- MacArthur Foundation Fellowship, MacArthur Foundation (1992-1997)
- Presidential Young Investigator, National Science Foundation (1984)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Member, President's Committee for the National Medal of Science (2011 - 2016)
- Trustee, California Academy of Sciences (2009 - 2017)
- Director, Annual Reviews, Incorporated (1994 - present)

PROFESSIONAL EDUCATION

- B.S. with Honors, California Inst. of Technology , Independ. Studies, Biochemistry (1973)
- Ph.D., Yale University , Cell and Developmental Biology (1979)

COMMUNITY AND INTERNATIONAL WORK

- Regulation of symbiosis genes in *Sinorhizobium meliloti*

LINKS

- Long Lab Web Page: <http://longlab.stanford.edu>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Biochemistry, genetics and cell biology of plant-bacterial symbiosis

Teaching

COURSES

2023-24

- Advanced Seminar in Microbial Molecular Biology: BIO 346, CSB 346, GENE 346 (Aut, Win)
- Integrative and Experimental Microbiology: BIO 120, BIO 220 (Spr)
- Microbiology Literature: BIO 178, BIO 278 (Aut)

2022-23

- Advanced Seminar in Microbial Molecular Biology: BIO 346, CSB 346, GENE 346 (Aut, Win, Spr)
- Integrative and Experimental Microbiology: BIO 120, BIO 220 (Spr)
- Microbiology Literature: BIO 178, BIO 278 (Aut)

2021-22

- Advanced Seminar in Microbial Molecular Biology: BIO 346, CSB 346, GENE 346 (Aut, Win, Spr)
- Microbiology Literature: BIO 178, BIO 278 (Aut)

2020-21

- Advanced Seminar in Microbial Molecular Biology: BIO 346, CSB 346, GENE 346 (Aut, Win, Spr)
- Microbiology Experiments: BIO 62 (Win)
- Microbiology Literature: BIO 178, BIO 278 (Aut)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Steven Massa, Iris Mollhoff, Kevin Shih, Jessica Zhang

Undergraduate Major Advisor

Nicholas Panyanouvong

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Biochemistry (Phd Program)
- Biology (School of Humanities and Sciences) (Phd Program)
- Biophysics (Phd Program)

Publications

PUBLICATIONS

- **Symbiotic Performance of *Sinorhizobium meliloti* Lacking ppGpp Depends on the *Medicago* Host Species** *MOLECULAR PLANT-MICROBE INTERACTIONS*
Wippel, K., Long, S. R.
2019; 32 (6): 717–28
- **A high-throughput system to identify inhibitors of *Candidatus Liberibacter asiaticus* transcription regulators.** *Proceedings of the National Academy of Sciences of the United States of America*
Barnett, M. J., Solow-Cordero, D. E., Long, S. R.
2019
- **Genome-wide identification of genes directly regulated by ChvI and a consensus sequence for ChvI binding in *Sinorhizobium meliloti*** *MOLECULAR MICROBIOLOGY*
Ratib, N. R., Sabio, E. Y., Mendoza, C., Barnett, M. J., Clover, S. B., Ortega, J. A., Dela Cruz, F. M., Balderas, D., White, H., Long, S. R., Chen, E. J.
2018; 110 (4): 596–615
- **Most *Sinorhizobium meliloti* Extracytoplasmic Function Sigma Factors Control Accessory Functions.** *mSphere*
Lang, C., Barnett, M. J., Fisher, R. F., Smith, L. S., Diodati, M. E., Long, S. R.
2018; 3 (5)
- **Most *Sinorhizobium meliloti* Extracytoplasmic Function Sigma Factors Control Accessory Functions** *MSPHERE*
Lang, C., Barnett, M. J., Fisher, R. F., Smith, L. S., Diodati, M. E., Long, S. R.
2018; 3 (5)
- **Characterization of Novel Plant Symbiosis Mutants Using a New Multiple Gene-Expression Reporter *Sinorhizobium meliloti* Strain (vol 9, 848, 2018)** *FRONTIERS IN PLANT SCIENCE*
Lang, C., Smith, L. S., Haney, C. H., Long, S. R.
2018; 9: 848
- **OxyR-Dependent Transcription Response of *Sinorhizobium meliloti* to Oxidative Stress** *JOURNAL OF BACTERIOLOGY*
Lehman, A. P., Long, S. R.
2018; 200 (7)
- **Characterization of Novel Plant Symbiosis Mutants Using a New Multiple Gene-Expression Reporter *Sinorhizobium meliloti* Strain** *FRONTIERS IN PLANT SCIENCE*
Lang, C., Smith, L. S., Long, S. R.
2018; 9: 76
- **Novel Genes and Regulators That Influence Production of Cell Surface Exopolysaccharides in *Sinorhizobium meliloti*** *JOURNAL OF BACTERIOLOGY*
Barnett, M. J., Long, S. R.
2018; 200 (3)
- **Novel Genes and Regulators That Influence Production of Cell Surface Exopolysaccharides in *Sinorhizobium meliloti*.** *Journal of bacteriology*
Barnett, M. J., Long, S. R.
2018; 200 (3)
- **Snapshot: Signaling in Symbiosis.** *Cell*
Long, S. R.

2016; 167 (2): 582-582.e1

- **LDSS-P: an advanced algorithm to extract functional short motifs associated with coordinated gene expression** *NUCLEIC ACIDS RESEARCH*
Ichida, H., Long, S. R.
2016; 44 (11): 5045-5053
- **Contributions of *Sinorhizobium meliloti* Transcriptional Regulator DksA to Bacterial Growth and Efficient Symbiosis with *Medicago sativa*.** *Journal of bacteriology*
Wippel, K., Long, S. R.
2016; 198 (9): 1374-1383
- **Transcriptomic Analysis of *Sinorhizobium meliloti* and *Medicago truncatula* Symbiosis Using Nitrogen Fixation-Deficient Nodules** *MOLECULAR PLANT-MICROBE INTERACTIONS*
Lang, C., Long, S. R.
2015; 28 (8): 856-868
- **Symbiosis: Receptive to infection.** *Nature*
Long, S. R.
2015; 523 (7560): 298-9
- **The *Sinorhizobium meliloti* SyrM Regulon: Effects on Global Gene Expression Are Mediated by syrA and nodD3.** *Journal of bacteriology*
Barnett, M. J., Long, S. R.
2015; 197 (10): 1792-1806
- **Exopolysaccharides from *Sinorhizobium meliloti* Can Protect against H₂O₂-Dependent Damage** *JOURNAL OF BACTERIOLOGY*
Lehman, A. P., Long, S. R.
2013; 195 (23): 5362-5369
- **Isolation and Characterization of Mutant *Sinorhizobium meliloti* NodD1 Proteins with Altered Responses to Luteolin** *JOURNAL OF BACTERIOLOGY*
Peck, M. C., Fisher, R. F., Bliss, R., Long, S. R.
2013; 195 (16): 3714-3723
- **Global mapping of transcription start sites and promoter motifs in the symbiotic α-proteobacterium *Sinorhizobium meliloti* 1021** *BMC GENOMICS*
Schlueter, J., Reinkensmeier, J., Barnett, M. J., Lang, C., Krol, E., Giegerich, R., Long, S. R., Becker, A.
2013; 14
- **Development of Tools for the Biochemical Characterization of the Symbiotic Receptor-Like Kinase DMI2** *MOLECULAR PLANT-MICROBE INTERACTIONS*
Riely, B. K., Larrainzar, E., Haney, C. H., Mun, J., Gil-Quintana, E., Gonzalez, E. M., Yu, H., Tricoli, D., Ehrhardt, D. W., Long, S. R., Cook, D. R.
2013; 26 (2): 216-226
- **Dual RpoH Sigma Factors and Transcriptional Plasticity in a Symbiotic Bacterium** *JOURNAL OF BACTERIOLOGY*
Barnett, M. J., Bittner, A. N., Toman, C. J., Oke, V., Long, S. R.
2012; 194 (18): 4983-4994
- **Rhizobial Plasmids That Cause Impaired Symbiotic Nitrogen Fixation and Enhanced Host Invasion** *MOLECULAR PLANT-MICROBE INTERACTIONS*
Crook, M. B., Lindsay, D. P., Biggs, M. B., Bentley, J. S., Price, J. C., Clement, S. C., Clement, M. J., Long, S. R., Griffitts, J. S.
2012; 25 (8): 1026-1033
- **The conserved polarity factor PodJ1 impacts multiple cell envelope-associated functions in *Sinorhizobium meliloti*** *MOLECULAR MICROBIOLOGY*
Fields, A. T., Navarrete, C. S., Zare, A. Z., Huang, Z., Mostafavi, M., Lewis, J. C., Rezaeihaghghi, Y., Brezler, B. J., Ray, S., Rizzacasa, A. L., Barnett, M. J., Long, S. R., Chen, et al
2012; 84 (5): 892-920
- **Pseudonodule Formation by Wild-Type and Symbiotic Mutant *Medicago truncatula* in Response to Auxin Transport Inhibitors** *MOLECULAR PLANT-MICROBE INTERACTIONS*
Rightmyer, A. P., Long, S. R.
2011; 24 (11): 1372-1384
- **The ROOT DETERMINED NODULATION1 Gene Regulates Nodule Number in Roots of *Medicago truncatula* and Defines a Highly Conserved, Uncharacterized Plant Gene Family** *PLANT PHYSIOLOGY*

- Schnabel, E. L., Kassaw, T. K., Smith, L. S., Marsh, J. F., Oldroyd, G. E., Long, S. R., Frugoli, J. A.
2011; 157 (1): 328-340
- **Symbiotic Rhizobia Bacteria Trigger a Change in Localization and Dynamics of the *Medicago truncatula* Receptor Kinase LYK3** *PLANT CELL*
Haney, C. H., Riely, B. K., Tricoli, D. M., Cook, D. R., Ehrhardt, D. W., Long, S. R.
2011; 23 (7): 2774-2787
 - **Employing Site-Specific Recombination for Conditional Genetic Analysis in *Sinorhizobium meliloti*** *APPLIED AND ENVIRONMENTAL MICROBIOLOGY*
Harrison, C. L., Crook, M. B., Peco, G., Long, S. R., Griffitts, J. S.
2011; 77 (12): 3916-3922
 - **COMPETENCIES IN PREMEDICAL AND MEDICAL EDUCATION** the AAMC-HHMI Report *PERSPECTIVES IN BIOLOGY AND MEDICINE*
Alpern, R. J., Belitsky, R., Long, S.
2011; 54 (1): 30-35
 - **Conservation in Function of a SCAR/WAVE Component During Infection Thread and Root Hair Growth in *Medicago truncatula*** *MOLECULAR PLANT-MICROBE INTERACTIONS*
Miyahara, A., Richens, J., Starker, C., Morieri, G., Smith, L., Long, S., Downie, J. A., Oldroyd, G. E.
2010; 23 (12): 1553-1562
 - **Transcript profiling in *M. truncatula* lss and sunn-1 mutants reveals different expression profiles despite disrupted SUNN gene function in both mutants.** *Plant signaling & behavior*
Schnabel, E., Smith, L., Long, S., Frugoli, J.
2010; 5 (12): 1657-1659
 - **The lss Supernodulation Mutant of *Medicago truncatula* Reduces Expression of the SUNN Gene** *PLANT PHYSIOLOGY*
Schnabel, E., Mukherjee, A., Smith, L., Kassaw, T., Long, S., Frugoli, J.
2010; 154 (3): 1390-1402
 - **Role of the *Sinorhizobium meliloti* Global Regulator Hfp in Gene Regulation and Symbiosis** *MOLECULAR PLANT-MICROBE INTERACTIONS*
Gao, M., Barnett, M. J., Long, S. R., Teplitski, M.
2010; 23 (4): 355-365
 - **A Nodule-Specific Protein Secretory Pathway Required for Nitrogen-Fixing Symbiosis** *SCIENCE*
Wang, D., Griffitts, J., Starker, C., Fedorova, E., Limpens, E., Ivanov, S., Bisseling, T., Long, S.
2010; 327 (5969): 1126-1129
 - **Striking a balance** *EMBO REPORTS*
Breithaupt, H., Caddick, S., Long, S. R.
2010; 11 (2): 82-85
 - **Plant flotillins are required for infection by nitrogen-fixing bacteria** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Haney, C. H., Long, S. R.
2010; 107 (1): 478-483
 - **Medical Report's Static Charge Sparks Shock Response** *SCIENCE*
Alpern, R., Long, S.
2009; 326 (5959): 1481-1482
 - **Identification of Direct Transcriptional Target Genes of ExoS/ChvI Two- Component Signaling in *Sinorhizobium meliloti*** *JOURNAL OF BACTERIOLOGY*
Chen, E. J., Fisher, R. F., Perovich, V. M., Sabio, E. A., Long, S. R.
2009; 191 (22): 6833-6842
 - **Science for Future Physicians** *SCIENCE*
Long, S., Alpern, R.
2009; 324 (5932): 1241-1241
 - **A portal for rhizobial genomes: RhizoGATE integrates a *Sinorhizobium meliloti* genome annotation update with postgenome data** *JOURNAL OF BIOTECHNOLOGY*
Becker, A., Barnett, M. J., Capela, D., Dondrup, M., Kamp, P., Krol, E., Linke, B., Rueberg, S., Runte, K., Schroeder, B. K., Weidner, S., Yurgel, S. N., Batut, et al

2009; 140 (1-2): 45-50

● **The periplasmic regulator ExoR inhibits ExoS/ChvI two-component signalling in *Sinorhizobium meliloti* MOLECULAR MICROBIOLOGY**

Chen, E. J., Sabio, E. A., Long, S. R.
2008; 69 (5): 1290-1303

● **The *Medicago truncatula* ortholog of *Arabidopsis* EIN2, sickle, is a negative regulator of symbiotic and pathogenic microbial associations PLANT JOURNAL**

Penmetsa, R. V., Uribe, P., Anderson, J., Lichtenzveig, J., Gish, J., Nam, Y. W., Engstrom, E., Xu, K., Sckisel, G., Pereira, M., Baek, J. M., Lopez-Meyer, M., Long, et al
2008; 55 (4): 580-595

● **A *Sinorhizobium meliloti* osmosensory two-component system required for cyclic glucan export and symbiosis MOLECULAR MICROBIOLOGY**

Griffitts, J. S., Carlyon, R. E., Erickson, J. H., Moulton, J. L., Barnett, M. J., Toman, C. J., Long, S. R.
2008; 69 (2): 479-490

● **A symbiotic mutant of *Sinorhizobium meliloti* reveals a novel genetic pathway involving succinoglycan biosynthetic functions MOLECULAR MICROBIOLOGY**

Griffitts, J. S., Long, S. R.
2008; 67 (6): 1292-1306

● **The symbiosis regulator CbrA modulates a complex regulatory network affecting the flagellar apparatus and cell envelope proteins JOURNAL OF BACTERIOLOGY**

Gibson, K. E., Barnett, M. J., Toman, C. J., Long, S. R., Walker, G. C.
2007; 189 (9): 3591-3602

● ***Medicago truncatula* NIN is essential for rhizobial-independent nodule organogenesis induced by autoactive calcium/calmodulin-dependent protein kinase PLANT PHYSIOLOGY**

Marsh, J. F., Rakoccevic, A., Mitra, R. M., Brocard, L., Sun, J., Eschstruth, A., Long, S. R., Schultze, M., Ratet, P., Oldroyd, G. E.
2007; 144 (1): 324-335

● **ExoR is genetically coupled to the ExoS-ChvI two-component system and located in the periplasm of *Sinorhizobium meliloti* MOLECULAR MICROBIOLOGY**

Wells, D. H., Chen, E. J., Fisher, R. F., Long, S. R.
2007; 64 (3): 647-664

● **An ERF transcription factor in *Medicago truncatula* that is essential for nod factor signal transduction PLANT CELL**

Middleton, P. H., Jakab, J., Penmetsa, R. V., Starker, C. G., Doll, J., Kalo, P., Prabhu, R., Marsh, J. F., Mitra, R. M., Kereszt, A., Dudas, B., VandenBosch, K., Long, et al
2007; 19 (4): 1221-1234

● **Diverse flavonoids stimulate NodD1 binding to nod gene promoters in *Sinorhizobium meliloti* JOURNAL OF BACTERIOLOGY**

Peck, M. C., Fisher, R. F., Long, S. R.
2006; 188 (15): 5417-5427

● **Nitrogen fixation mutants of *Medicago truncatula* fail to support plant and bacterial symbiotic gene expression PLANT PHYSIOLOGY**

Starker, C. G., Parra-Colmenares, A. L., Smith, L., Mitra, R. M., Long, S. R.
2006; 140 (2): 671-680

● **An anisotropic-viscoplastic model of plant cell morphogenesis by tip growth INTERNATIONAL JOURNAL OF DEVELOPMENTAL BIOLOGY**

Dumais, J., Shaw, S. L., Steele, C. R., Long, S. R., Ray, P. M.
2006; 50 (2-3): 209-222

● **Reducing *Candida* infections during neonatal intensive care: Management choices, infection control, and fluconazole prophylaxis JOURNAL OF PEDIATRICS**

Long, S. S., Stevenson, D. K.
2005; 147 (2): 135-141

● **Nodulation signaling in legumes requires NSP2, a member of the GRAS family of transcriptional regulators SCIENCE**

Kalo, P., Gleason, C., Edwards, A., Marsh, J., Mitra, R. M., Hirsch, S., Jakab, J., Sims, S., Long, S. R., Rogers, J., Kiss, G. B., Downie, J. A., Oldroyd, et al
2005; 308 (5729): 1786-1789

- **Genetic and molecular analysis of Nod factor signalling in *Medicago truncatula*** *14th International Nitrogen Fixation Congress*
Debelle, F., Bres, C., Levy, J., Ben Amor, B., Arrighi, J. F., Maillet, F., Ane, J. M., Rosenberg, C., Denarie, J., Shaw, S., Oldroyd, G., Long, S., Penmetsa, et al
SPRINGER.2005: 165–168
- **Activation and perception of calcium oscillations during Nod factor signalling** *14th International Nitrogen Fixation Congress*
Gleason, C., Mitra, R., Kalo, P., Galera, C., Gough, C., Denarie, J., Long, S. R., Oldroyd, G. E.
SPRINGER.2005: 169–172
- **A dual-genome Symbiosis Chip for coordinate study of signal exchange and development in a prokaryote-host interaction** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Barnett, M. J., Tolman, C. J., Fisher, R. F., Long, S. R.
2004; 101 (47): 16636-16641
- **The mechanics of surf ace expansion anisotropy in *Medicago truncatula* root hairs** *PLANT PHYSIOLOGY*
Dumais, J., Long, S. R., Shaw, S. L.
2004; 136 (2): 3266-3275
- **Six nonnodulating plant mutants defective for Nod factor-induced transcriptional changes associated with the legume-rhizobia symbiosis** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Mitra, R. M., Shaw, S. L., Long, S. R.
2004; 101 (27): 10217-10222
- **A Ca²⁺/calmodulin-dependent protein kinase required for symbiotic nodule development: Gene identification by transcript-based cloning** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Mitra, R. M., Gleason, C. A., Edwards, A., Hadfield, J., Downie, J. A., Oldroyd, G. E., Long, S. R.
2004; 101 (13): 4701-4705
- ***Medicago truncatula* DMI1 required for bacterial and fungal symbioses in legumes** *SCIENCE*
Ane, J. M., Kiss, G. B., Riely, B. K., Penmetsa, R. V., Oldroyd, G. E., Ayax, C., Levy, J., Debelle, F., Baek, J. M., Kalo, P., Rosenberg, C., Roe, B. A., Long, et al
2004; 303 (5662): 1364-1367
- **Plant and bacterial symbiotic mutants define three transcriptionally distinct stages in the development of the *Medicago truncatula*/*Sinorhizobium meliloti* symbiosis** *PLANT PHYSIOLOGY*
Mitra, R. M., Long, S. R.
2004; 134 (2): 595-604
- **Mutations in rpo-BC suppress the defects of a *Sinorhizobium meliloti* relA mutant** *JOURNAL OF BACTERIOLOGY*
Wells, D. H., Long, S. R.
2003; 185 (18): 5602-5610
- **Nod factor inhibition of reactive oxygen efflux in a host legume** *PLANT PHYSIOLOGY*
Shaw, S. L., Long, S. R.
2003; 132 (4): 2196-2204
- **The NFP locus of *Medicago truncatula* controls an early step of Nod factor signal transduction upstream of a rapid calcium flux and root hair deformation** *PLANT JOURNAL*
Ben Amor, B., Shaw, S. L., Oldroyd, G. E., Maillet, F., Penmetsa, R. V., Cook, D., Long, S. R., Denarie, J., Gough, C.
2003; 34 (4): 495-506
- **Rhizobium-induced calcium spiking in *Lotus japonicus*** *MOLECULAR PLANT-MICROBE INTERACTIONS*
Harris, J. M., Wais, R., Long, S. R.
2003; 16 (4): 335-341
- **Identification and characterization of nodulation-signaling pathway 2, a gene of *Medicago truncatula* involved in Nod factor signaling** *PLANT PHYSIOLOGY*
Oldroyd, G. E., Long, S. R.
2003; 131 (3): 1027-1032
- **Nod factor elicits two separable calcium responses in *Medicago truncatula* root hair cells** *PLANT PHYSIOLOGY*
Shaw, S. L., Long, S. R.

2003; 131 (3): 976-984

● **Dual genetic pathways controlling nodule number in *Medicago truncatula*** *PLANT PHYSIOLOGY*

Penmetsa, R. V., Frugoli, J. A., Smith, L. S., Long, S. R., Cook, D. R.
2003; 131 (3): 998-1008

● **A *Sinorhizobium meliloti* lipopolysaccharide mutant altered in cell surface sulfation** *JOURNAL OF BACTERIOLOGY*

Keating, D. H., Willits, M. G., Long, S. R.
2002; 184 (23): 6681-6689

● **Analysis of differences between *Sinorhizobium meliloti* 1021 and 2011 strains using the host calcium spiking response** *MOLECULAR PLANT-MICROBE INTERACTIONS*

Wais, R. J., Wells, D. H., Long, S. R.
2002; 15 (12): 1245-1252

● **The RNA polymerase α subunit from *Sinorhizobium meliloti* can assemble with RNA polymerase subunits from *Escherichia coli* and function in basal and activated transcription both in vivo and in vitro** *JOURNAL OF BACTERIOLOGY*

Peck, M. C., Gaal, T., Fisher, R. F., Gourse, R. L., Long, S. R.
2002; 184 (14): 3808-3814

● **Activity of *Sinorhizobium meliloti* NodAB and NodH enzymes on thiochitooligosaccharides** *JOURNAL OF BACTERIOLOGY*

Southwick, A. M., Wang, L. X., Long, S. R., Lee, Y. C.
2002; 184 (14): 4039-4043

● **Structure-function analysis of nod factor-induced root hair calcium spiking in rhizobium-legume symbiosis** *PLANT PHYSIOLOGY*

Wais, R. J., Keating, D. H., Long, S. R.
2002; 129 (1): 211-224

● **Nodulation in legumes (Book Review)** *NATURE*

Book Review Authored by: Long, S. R.
2002; 416 (6880): 478-478

● **Pharmacological analysis of nod factor-induced calcium spiking in *Medicago truncatula*. Evidence for the requirement of type IIA calcium pumps and phosphoinositide signaling** *PLANT PHYSIOLOGY*

Engstrom, E. M., Ehrhardt, D. W., Mitra, R. M., Long, S. R.
2002; 128 (4): 1390-1401

● **The *Sinorhizobium meliloti* stringent response affects multiple aspects of symbiosis** *MOLECULAR MICROBIOLOGY*

Wells, D. H., Long, S. R.
2002; 43 (5): 1115-1127

● **Heterologous expression to assay for plant lectins or receptors** *PLANT MOLECULAR BIOLOGY REPORTER*

Southwick, A. M., Long, S. R.
2002; 20 (1): 27-41

● **Luteolin and GroEL modulate in vitro activity of NodD** *JOURNAL OF BACTERIOLOGY*

Yeh, K. C., Peck, M. C., Long, S. R.
2002; 184 (2): 525-530

● **Evidence for structurally specific negative feedback in the Nod factor signal transduction pathway** *PLANT JOURNAL*

Oldroyd, G. E., Mitra, R. M., Wais, R. J., Long, S. R.
2001; 28 (2): 191-199

● **Identification of the heat-shock sigma factor RpoH and a second RpoH-like protein in *Sinorhizobium meliloti*** *MICROBIOLOGY-SGM*

Oke, V., Rushing, B. G., Fisher, E. J., Moghadam-Tabrizi, M., Long, S. R.
2001; 147: 2399-2408

● **Nucleotide sequence and predicted functions of the entire *Sinorhizobium meliloti* pSymA megaplasmid** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*

Barnett, M. J., Fisher, R. F., Jones, T., Komp, C., Abola, A. P., Barloy-Hubler, F., Bowser, L., Capela, D., Galibert, F., Gouzy, J., Gurjal, M., Hong, A., Huizar, et al
2001; 98 (17): 9883-9888

- **Ethylene inhibits the nod factor signal transduction pathway of *Medicago truncatula*** *PLANT CELL*
Oldroyd, G. E., Engstrom, E. M., Long, S. R.
2001; 13 (8): 1835-1849
- **The composite genome of the legume symbiont *Sinorhizobium meliloti*** *SCIENCE*
Galibert, F., Finan, T. M., Long, S. R., Puhler, A., Abola, P., Ampe, F., Barloy-Hubler, F., Barnett, M. J., Becker, A., Boistard, P., Bothe, G., Boutry, M., Bowser, et al
2001; 293 (5530): 668-672
- **A homolog of the CtrA cell cycle regulator is present and essential in *Sinorhizobium meliloti*** *JOURNAL OF BACTERIOLOGY*
Barnett, M. J., Hung, D. Y., Reisenauer, A., Shapiro, L., Long, S. R.
2001; 183 (10): 3204-3210
- **Genes and signals in the Rhizobium-legume symbiosis** *PLANT PHYSIOLOGY*
Long, S. R.
2001; 125 (1): 69-72
- **Genetic analysis of calcium spiking responses in nodulation mutants of *Medicago truncatula*** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Wais, R. J., Galera, C., Oldroyd, G., Catoira, R., Penmetsa, R. V., Cook, D., Gough, C., Denarie, J., Long, S. R.
2000; 97 (24): 13407-13412
- **Cell surface expansion in polarly growing root hairs of *Medicago truncatula*** *PLANT PHYSIOLOGY*
Shaw, S. L., Dumais, J., Long, S. R.
2000; 124 (3): 959-969
- **New genetic tools for use in the Rhizobiaceae and other bacteria** *BIOTECHNIQUES*
Barnett, R. J., OKE, V., Long, S. R.
2000; 29 (2): 240-?
- **High-resolution physical map of the *Sinorhizobium meliloti* 1021 pSyma megaplasmid** *JOURNAL OF BACTERIOLOGY*
Barloy-Hubler, F., Capela, D., Barnett, M. J., Kalman, S., Federspiel, N. A., Long, S. R., Galibert, F.
2000; 182 (4): 1185-1189
- **Bacteroid formation in the Rhizobium-legume symbiosis** *CURRENT OPINION IN MICROBIOLOGY*
OKE, V., Long, S. R.
1999; 2 (6): 641-646
- **Expression of the pea (*Pisum sativum* L.) alpha-tubulin gene *TubA1* is correlated with cell division activity** *PLANT MOLECULAR BIOLOGY*
Stotz, H. U., Long, S. R.
1999; 41 (5): 601-614
- **Reduction of adenosine-5'-phosphosulfate instead of 3'-phosphoadenosine-5'-phosphosulfate in cysteine biosynthesis by *Rhizobium meliloti* and other members of the family Rhizobiaceae** *JOURNAL OF BACTERIOLOGY*
Abola, A. P., Willits, M. G., Wang, R. C., Long, S. R.
1999; 181 (17): 5280-5287
- **Bacterial genes induced within the nodule during the Rhizobium-legume symbiosis** *MOLECULAR MICROBIOLOGY*
OKE, V., Long, S. R.
1999; 32 (4): 837-849
- **alpha-galactoside uptake in *Rhizobium meliloti*: Isolation and characterization of *agpA*, a gene encoding a periplasmic binding protein required for melibiose and raffinose utilization** *JOURNAL OF BACTERIOLOGY*
Gage, D. J., Long, S. R.
1998; 180 (21): 5739-5748
- **Requirements for *syrM* and *nodD* genes in the nodulation of *Medicago truncatula* by *Rhizobium meliloti* 1021** *MOLECULAR PLANT-MICROBE INTERACTIONS*
Smith, L. S., Long, S. R.
1998; 11 (9): 937-940

- **Expressed sequence tags from a root-hair-enriched *Medicago truncatula* cDNA library** *PLANT PHYSIOLOGY*
Covitz, P. A., Smith, L. S., Long, S. R.
1998; 117 (4): 1325-1332
- **Multiple genetic controls on *Rhizobium meliloti* syrA, a regulator of exopolysaccharide abundance** *GENETICS*
Barnett, M. J., Swanson, J. A., Long, S. R.
1998; 148 (1): 19-32
- **Identification and characterization of a gene on *Rhizobium meliloti* pSymA, syrB, that negatively affects syrM expression** *MOLECULAR PLANT-MICROBE INTERACTIONS*
Barnett, M. J., Long, S. R.
1997; 10 (5): 550-559
- **Use of green fluorescent protein to visualize the early events of symbiosis between *Rhizobium meliloti* and alfalfa (*Medicago sativa*)** *JOURNAL OF BACTERIOLOGY*
Gage, D. J., Bobo, T., Long, S. R.
1996; 178 (24): 7159-7166
- **Deletion analysis of the 5' untranslated region of the *Rhizobium meliloti* nodF gene** *MOLECULAR PLANT-MICROBE INTERACTIONS*
KALINOWSKI, G., Long, S. R.
1996; 9 (9): 869-873
- **Rhizobium symbiosis: Nod factors in perspective** *PLANT CELL*
Long, S. R.
1996; 8 (10): 1885-1898
- **Calcium spiking in alfalfa root hairs responding to *Rhizobium meliloti* nodulation signals**
Ehrhardt, D., Wais, R., Long, S. R.
AMER SOC PLANT BIOLOGISTS.1996: 61002-
- **Calcium spiking in plant root hairs responding to *Rhizobium* nodulation signals** *CELL*
Ehrhardt, D. W., Wais, R., Long, S. R.
1996; 85 (5): 673-681
- **Transcription start sites for syrM and nodD3 flank an insertion sequence relic in *Rhizobium meliloti*** *JOURNAL OF BACTERIOLOGY*
Barnett, M. J., Rushing, B. G., Fisher, R. F., Long, S. R.
1996; 178 (7): 1782-1787
- **CLONING AND CHARACTERIZATION OF THE SIGA GENE ENCODING THE MAJOR SIGMA-SUBUNIT OF RHIZOBIUM-MELILOTI** *JOURNAL OF BACTERIOLOGY*
Rushing, B. G., Long, S. R.
1995; 177 (23): 6952-6957
- **IN-VITRO SULFOTRANSFERASE ACTIVITY OF NODH, A NODULATION PROTEIN OF RHIZOBIUM-MELILOTI REQUIRED FOR HOST-SPECIFIC NODULATION** *JOURNAL OF BACTERIOLOGY*
Ehrhardt, D. W., Atkinson, E. M., Faull, K. F., Freedberg, D. I., Sutherlin, D. P., Armstrong, R., Long, S. R.
1995; 177 (21): 6237-6245
- **SIGNALS AND CELL RESPONSES IN RHIZOBIUM SYMBIOSIS**
Long, S. R.
ACADEMIC PRESS INC ELSEVIER SCIENCE.1995: 742-42
- **PLANT PHYSIOLOGY - 3 YEARS INTO A NEW ERA** *PLANT PHYSIOLOGY*
Long, S.
1995; 108 (3): 883-884
- **IMPROVING SCIENCE LITERACY AND SCIENCE-EDUCATION AT THE UNIVERSITY-LEVEL**
Long, S. R.
AMER SOC PLANT BIOLOGISTS.1995: 16-16

- **THE DNAA GENE OF RHIZOBIUM-MELILOTI LIES WITHIN AN UNUSUAL GENE ARRANGEMENT** *JOURNAL OF BACTERIOLOGY*
Margolin, W., Bramhill, D., Long, S. R.
1995; 177 (10): 2892-2900
- **THE RHIZOBIUM-MELILOTI GROELC LOCUS IS REQUIRED FOR REGULATION OF EARLY NOD GENES BY THE TRANSCRIPTION ACTIVATOR NODD GENES & DEVELOPMENT**
Ogawa, J., Long, S. R.
1995; 9 (6): 714-729
- **EXPRESSION AND BIOCHEMICAL FUNCTION OF NODPQ1 AND NODPQ2 IN RHIZOBIUM-MELILOTI**
Willits, M. G., Long, S. R.
WILEY-BLACKWELL.1995: 492-492
- **THE PISUM-SATIVUM TUBA1 GENE, A MEMBER OF A SMALL FAMILY OF ALPHA-TUBULIN SEQUENCES** *PLANT MOLECULAR BIOLOGY*
BRIERLEY, H. L., Webster, P., Long, S. R.
1995; 27 (4): 715-727
- **DIFFERENTIATION OF RHIZOBIUM DURING NODULATION OF ALFALFA**
OKE, V., RUSHING, B., Willits, M., Long, S.
WILEY-BLACKWELL.1995: 341-341
- **PLANT-CELL RESPONSES TO RHIZOBIUM DURING SYMBIOSIS**
Long, S. R., Ehrhardt, D. W., Southwick, A., Allen, N. S., COVITZ, P., STOTZ, H.
WILEY-BLACKWELL.1995: 126-126
- **THE DNAA GENE OF RHIZOBIUM-MELILOTI LIES WITHIN AN UNUSUAL GENE ARRANGEMENT**
Margolin, W., Long, S. R.
WILEY-BLACKWELL.1995: 113-113
- **RHIZOBIUM-MELILOTI NODP AND NODQ FORM A MULTIFUNCTIONAL SULFATE-ACTIVATING COMPLEX REQUIRING GTP FOR ACTIVITY** *JOURNAL OF BACTERIOLOGY*
SCHWEDOCK, J. S., Liu, C. X., Leyh, T. S., Long, S. R.
1994; 176 (22): 7055-7064
- **BIOSYNTHESIS OF RHIZOBIUM-MELILOTI LIPOOLIGOSACCHARIDE NOD FACTORS - NODA IS REQUIRED FOR AN N-ACYLTRANSFERASE ACTIVITY** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Atkinson, E. M., Palcic, M. M., Hindsgaul, O., Long, S. R.
1994; 91 (18): 8418-8422
- **RHIZOBIUM-MELILOTI CONTAINS A NOVEL 2ND-HOMOLOG OF THE CELL-DIVISION GENE FTSZ** *JOURNAL OF BACTERIOLOGY*
Margolin, W., Long, S. R.
1994; 176 (7): 2033-2043
- **WOMEN IN BIOMEDICINE - ENCOURAGEMENT SCIENCE**
Long, S. R., ZAKIAN, V., Allen, N. S., Arvin, A. M., Bakken, A., BEEMON, K., Belfort, M., Bennett, K. L., Bissell, M. J., Blackburn, E., Blau, H., Carlson, M., Chandler, et al
1994; 263 (5152): 1357-1358
- **Morphogenetic Rescue of Rhizobium meliloti Nodulation Mutants by trans-Zeatin Secretion.** *The Plant cell*
Cooper, J. B., Long, S. R.
1994; 6 (2): 215-225
- **MORPHOGENETIC RESCUE OF RHIZOBIUM-MELILOTI NODULATION MUTANTS BY TRANS-ZEATIN SECRETION** *PLANT CELL*
Cooper, J. B., Long, S. R.
1994; 6 (2): 215-225
- **Effects of Nod factors on alfalfa root hair Ca++ and H+ currents and on cytoskeletal behavior** *7th International Symposium on Molecular Plant-Microbe Interactions*
Allen, N. S., BENNETT, M. N., Cox, D. N., Shipley, A., Ehrhardt, D. W., Long, S. R.
KLUWER ACADEMIC PUBL.1994: 107-113

- **Nodulation gene expression in Rhizobium meliloti** *7th International Symposium on Molecular Plant-Microbe Interactions*
Fisher, R. F., RUSHING, B., Ogawa, J., Barnett, M., Long, S. R.
KLUWER ACADEMIC PUBL.1994: 99-102
- **AN OPEN READING FRAME DOWNSTREAM OF RHIZOBIUM-MELILOTI NODQ1 SHOWS NUCLEOTIDE-SEQUENCE SIMILARITY TO AN AGROBACTERIUM-TUMEFACIENS INSERTION-SEQUENCE** *MOLECULAR PLANT-MICROBE INTERACTIONS*
Schwedock, J., Long, S. R.
1994; 7 (1): 151-153
- **INTERACTIONS OF NODD AT THE NOD BOX - NODD BINDS TO 2 DISTINCT SITES ON THE SAME FACE OF THE HELIX AND INDUCES A BEND IN THE DNA** *JOURNAL OF MOLECULAR BIOLOGY*
Fisher, R. F., Long, S. R.
1993; 233 (3): 336-348
- **ISOLATION AND CHARACTERIZATION OF A DNA-REPLICATION ORIGIN FROM THE 1,700-KILOBASE-PAIR SYMBIOTIC MEGAPLASMID PSYM-B OF RHIZOBIUM-MELILOTI** *JOURNAL OF BACTERIOLOGY*
Margolin, W., Long, S. R.
1993; 175 (20): 6553-6561
- **PROKARYOTIC PLANT PARASITES** *CELL*
Long, S. R., Staskawicz, B. J.
1993; 73 (5): 921-935
- **REGULATION OF SYRM AND NODD3 IN RHIZOBIUM-MELILOTI GENETICS**
Swanson, J. A., Mulligan, J. T., Long, S. R.
1993; 134 (2): 435-444
- **EARLY IONIC RESPONSES OF ALFALFA ROOT HAIRS TO NODULATION FACTORS - A VIBRATING PROBE ANALYSIS**
Cox, D. N., Shipley, A., Ehrhardt, D. W., Long, S. R., Allen, N. S.
AMER SOC PLANT BIOLOGISTS.1993: 110-10
- **RHIZOBIUM-MELILOTI GENES INVOLVED IN SULFATE ACTIVATION - THE 2 COPIES OF NODPQ AND A NEW LOCUS, SAA** *GENETICS*
SCHWEDOCK, J. S., Long, S. R.
1992; 132 (4): 899-909
- **HOMOLOGY OF RHIZOBIUM-MELILOTI NODC TO POLYSACCHARIDE POLYMERIZING ENZYMES** *MOLECULAR PLANT-MICROBE INTERACTIONS*
Atkinson, E. M., Long, S. R.
1992; 5 (5): 439-442
- **RHIZOBIUM - PLANT SIGNAL EXCHANGE** *NATURE*
Fisher, R. F., Long, S. R.
1992; 357 (6380): 655-660
- **DEPOLARIZATION OF ALFALFA ROOT HAIR MEMBRANE-POTENTIAL BY RHIZOBIUM-MELILOTI NOD FACTORS** *SCIENCE*
Ehrhardt, D. W., Atkinson, E. M., Long, S. R.
1992; 256 (5059): 998-1000
- **CLONING AND CHARACTERIZATION OF A RHIZOBIUM-MELILOTI HOMOLOG OF THE ESCHERICHIA-COLI CELL-DIVISION GENE FTSZ** *JOURNAL OF BACTERIOLOGY*
Margolin, W., Corbo, J. C., Long, S. R.
1991; 173 (18): 5822-5830
- **ANALYSIS OF RHIZOBIUM-MELILOTI NODULATION MUTANT WL131 - NOVEL INSERTION-SEQUENCE ISRM3 IN NODG AND ALTERED NODH PROTEIN PRODUCT** *JOURNAL OF BACTERIOLOGY*
Ogawa, J., BRIERLEY, H. L., Long, S. R.
1991; 173 (10): 3060-3065
- **GENETIC AND PHYSICAL ANALYSIS OF THE NODD3 REGION OF RHIZOBIUM-MELILOTI** *NUCLEIC ACIDS RESEARCH*
Rushing, B. G., YELTON, M. M., Long, S. R.

1991; 19 (4): 921-927

• **FUNDING AMERICA SCIENTISTS** *FORTUNE*

Long, S. R.

1991; 123 (3): 142-142

• **RHIZOBIUM-MELILOTI NODULATION GENE-REGULATION AND MOLECULAR SIGNALS** *5TH INTERNATIONAL SYMP ON THE MOLECULAR GENETICS OF PLANT-MICROBE INTERACTIONS*

Long, S. R., Fisher, R. F., Ogawa, J., Swanson, J., Ehrhardt, D. W., Atkinson, E. M., SCHWEDOCK, J. S.

KLUWER ACADEMIC PUBL. 1991: 127-133

• **ATP SULPHURYLASE ACTIVITY OF THE NODP AND NODQ GENE-PRODUCTS OF RHIZOBIUM-MELILOTI** *NATURE*

Schwedock, J., Long, S. R.

1990; 348 (6302): 644-647

• **DNA-SEQUENCE AND TRANSLATIONAL PRODUCT OF A NEW NODULATION-REGULATORY LOCUS - SYRM HAS SEQUENCE SIMILARITY TO NODD PROTEINS** *JOURNAL OF BACTERIOLOGY*

Barnett, M. J., Long, S. R.

1990; 172 (7): 3695-3700

• **NUCLEOTIDE-SEQUENCE OF AN ALFALFA CALMODULIN CDNA** *NUCLEIC ACIDS RESEARCH*

Barnett, M. J., Long, S. R.

1990; 18 (11): 3395-3395

• **NITROGEN-FIXATION - RHIZOBIUM SWEET-TALKING** *NATURE*

Long, S. R., Atkinson, E. M.

1990; 344 (6268): 712-713

• **DNA FOOTPRINT ANALYSIS OF THE TRANSCRIPTIONAL ACTIVATOR PROTEINS NODD1 AND NODD3 ON INDUCIBLE NOD GENE PROMOTERS** *JOURNAL OF BACTERIOLOGY*

Fisher, R. F., Long, S. R.

1989; 171 (10): 5492-5502

• **Nucleotide sequence and protein products of two new nodulation genes of Rhizobium meliloti, nodP and nodQ.** *Molecular plant-microbe interactions*

Schwedock, J., Long, S. R.

1989; 2 (4): 181-194

• **A FAMILY OF ACTIVATOR GENES REGULATES EXPRESSION OF RHIZOBIUM-MELILOTI NODULATION GENES** *GENETICS*

Mulligan, J. T., Long, S. R.

1989; 122 (1): 7-18

• **NITROGEN-FIXATION - NEW ROUTE TO A STICKY SUBJECT** *NATURE*

Long, S. R., Ehrhardt, D. W.

1989; 338 (6216): 545-546

• **RHIZOBIUM-LEGUME NODULATION - LIFE TOGETHER IN THE UNDERGROUND CELL**

Long, S. R.

1989; 56 (2): 203-214

• **RHIZOBIUM GENETICS** *ANNUAL REVIEW OF GENETICS*

Long, S. R.

1989; 23: 483-506

• **A NON-NODULATING ALFALFA MUTANT DISPLAYS NEITHER ROOT HAIR CURLING NOR EARLY CELL-DIVISION IN RESPONSE TO RHIZOBIUM-MELILOTI PLANT CELL**

Dudley, M. E., Long, S. R.

1989; 1 (1): 65-72

• **ALFALFA ROOT EXUDATES AND COMPOUNDS WHICH PROMOTE OR INHIBIT INDUCTION OF RHIZOBIUM-MELILOTI NODULATION GENES** *PLANT PHYSIOLOGY*

Peters, N. K., Long, S. R.

1988; 88 (2): 396-400

• **SPECIFIC BINDING OF PROTEINS FROM RHIZOBIUM-MELILOTI CELL-FREE-EXTRACTS CONTAINING NODD TO DNA-SEQUENCES UPSTREAM OF INDUCIBLE NODULATION GENES *GENES & DEVELOPMENT***

Fisher, R. F., Egelhoff, T. T., Mulligan, J. T., Long, S. R.

1988; 2 (3): 282-293

• **EXTENDED REGION OF NODULATION GENES IN RHIZOBIUM-MELILOTI 1021 .1. PHENOTYPES OF TN5 INSERTION MUTANTS *GENETICS***

Swanson, J. A., Tu, J. K., Ogawa, J., Sanga, R., Fisher, R. F., Long, S. R.

1987; 117 (2): 181-189

• **EXTENDED REGION OF NODULATION GENES IN RHIZOBIUM-MELILOTI 1021 .2. NUCLEOTIDE-SEQUENCE, TRANSCRIPTION START SITES AND PROTEIN PRODUCTS *GENETICS***

Fisher, R. F., Swanson, J. A., Mulligan, J. T., Long, S. R.

1987; 117 (2): 191-201

• **EXPRESSION OF RHIZOBIUM-MELILOTI NOD GENES IN RHIZOBIUM AND AGROBACTERIUM BACKGROUNDS *JOURNAL OF BACTERIOLOGY***

YELTON, M. M., Mulligan, J. T., Long, S. R.

1987; 169 (7): 3094-3098

• **MICROSCOPIC STUDIES OF CELL DIVISIONS INDUCED IN ALFALFA ROOTS BY RHIZOBIUM-MELILOTI *PLANTA***

Dudley, M. E., Jacobs, T. W., Long, S. R.

1987; 171 (3): 289-301

• **TRANSCRIPTION OF RHIZOBIUM-MELILOTI NODULATION GENES - IDENTIFICATION OF A NODD TRANSCRIPTION INITIATION SITE INVITRO AND INVIVO *JOURNAL OF BIOLOGICAL CHEMISTRY***

Fisher, R. F., BRIERLEY, H. L., Mulligan, J. T., Long, S. R.

1987; 262 (14): 6849-6855

• **A PLANT FLAVONE, LUTEOLIN, INDUCES EXPRESSION OF RHIZOBIUM-MELILOTI NODULATION GENES *SCIENCE***

Peters, N. K., Frost, J. W., Long, S. R.

1986; 233 (4767): 977-980

• **REGULATION OF RHIZOBIUM INFECTION GENES**

Long, S. R.

WILEY-LISS.1986: 7-7

• **RHIZOBIUM MELILOTI NOD GENE-PRODUCTS**

Egelhoff, T., Long, S.

WILEY-LISS.1986: 32-32

• **INDUCTION OF RHOZOBIUM-MELILOTI NODC EXPRESSION BY PLANT EXUDATE REQUIRES NODD *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA***

Mulligan, J. T., Long, S. R.

1985; 82 (19): 6609-6613

• **RHIZOBIUM-MELILOTI NODULATION GENES - IDENTIFICATION OF NODDABC GENE-PRODUCTS, PURIFICATION OF NODA PROTEIN, AND EXPRESSION OF NODA IN RHIZOBIUM-MELILOTI *JOURNAL OF BACTERIOLOGY***

Egelhoff, T. T., Long, S. R.

1985; 164 (2): 591-599

• **PHYSICAL AND GENETIC-MAP OF A RHIZOBIUM-MELILOTI NODULATION GENE REGION AND NUCLEOTIDE-SEQUENCE OF NODC *JOURNAL OF BACTERIOLOGY***

Jacobs, T. W., Egelhoff, T. T., Long, S. R.

1985; 162 (2): 469-476

• **CONSERVED NODULATION GENES IN RHIZOBIUM-MELILOTI AND RHIZOBIUM-TRIFOLII *APPLIED AND ENVIRONMENTAL MICROBIOLOGY***

Fisher, R. F., Tu, J. K., Long, S. R.

1985; 49 (6): 1432-1435

- **NODULES ARE INDUCED ON ALFALFA ROOTS BY AGROBACTERIUM-TUMEFACIENS AND RHIZOBIUM-TRIFOLII CONTAINING SMALL SEGMENTS OF THE RHIZOBIUM-MELILOTI NODULATION REGION** *JOURNAL OF BACTERIOLOGY*
Hirsch, A. M., Drake, D., Jacobs, T. W., Long, S. R.
1985; 161 (1): 223-230
- **NUCLEOTIDE-SEQUENCE OF RHIZOBIUM-MELILOTI 1021 NODULATION GENES - NODD IS READ DIVERGENTLY FROM NODABC DNA** *A JOURNAL OF MOLECULAR & CELLULAR BIOLOGY*
Egelhoff, T. T., Fisher, R. F., Jacobs, T. W., Mulligan, J. T., Long, S. R.
1985; 4 (3): 241-248
- **WHY WHIP EGG-WHITES IN COPPER BOWLS** *NATURE*
McGEE, H. J., Long, S. R., Briggs, W. R.
1984; 308 (5960): 667-668
- **GENETIC-ANALYSIS OF RHIZOBIUM INFECTION**
Long, S. R., Jacobs, T. W., Egelhoff, T. T., deHostos, E. L., Mulligan, J. T., Tu, J. K., Sanga, R., Fisher, R. F.
MARY ANN LIEBERT INC. 1984: 56-56
- **GENERALIZED TRANSDUCTION IN RHIZOBIUM-MELILOTI** *JOURNAL OF BACTERIOLOGY*
Martin, M. O., Long, S. R.
1984; 159 (1): 125-129
- **THE MOLECULAR-BIOLOGY OF RHIZOBIUM LEGUME SYMBIOSIS** *INTERNATIONAL REVIEW OF CYTOLOGY-A SURVEY OF CELL BIOLOGY*
Verma, D. P., Long, S.
1983: 211-245
- **Physical and genetic characterization of Rhizobium meliloti symbiotic mutants.** *Journal of molecular and applied genetics*
Buikema, W. J., Long, S. R., Brown, S. E., van den Bos, R. C., Earl, C., Ausubel, F. M.
1983; 2 (3): 249-260
- **GENETIC-ANALYSIS OF SYMBIOTIC NITROGEN-FIXATION DEVELOPMENTS IN INDUSTRIAL MICROBIOLOGY**
Long, S. R., RUVKUN, G. B., Meade, H. M., BUIKEMA, W. E., Brown, S. E., Friedman, A. M., Ausubel, F. M.
1983; 24: 21-29
- **Cloning of Rhizobium meliloti nodulation genes by direct complementation of Nod? mutants** *Nature*
Long, S., Buikema, WJ, Ausubel, FM
1982; 298: 485-488
- **STRUCTURAL STUDIES OF ALFALFA ROOTS INFECTED WITH NODULATION MUTANTS OF RHIZOBIUM-MELILOTI** *JOURNAL OF BACTERIOLOGY*
Hirsch, A. M., Long, S. R., Bang, M., Haskins, N., Ausubel, F. M.
1982; 151 (1): 411-419
- **PHYSICAL AND GENETIC-CHARACTERIZATION OF SYMBIOTIC AND AUXOTROPHIC MUTANTS OF RHIZOBIUM-MELILOTI INDUCED BY TRANSPOSON TN5 MUTAGENESIS** *JOURNAL OF BACTERIOLOGY*
Meade, H. M., Long, S. R., RUVKUN, G. B., Brown, S. E., Ausubel, F. M.
1982; 149 (1): 114-122
- **ISRm1: A Rhizobium meliloti insertion sequence that transposes preferentially into nitrogen fixation genes.** *Journal of molecular and applied genetics*
RUVKUN, G. B., Long, S. R., Meade, H. M., van den Bos, R. C., Ausubel, F. M.
1982; 1 (5): 405-418
- **CONSTRUCTION OF A BROAD HOST RANGE COSMID CLONING VECTOR AND ITS USE IN THE GENETIC-ANALYSIS OF RHIZOBIUM MUTANTS GENE**
Friedman, A. M., Long, S. R., Brown, S. E., Buikema, W. J., Ausubel, F. M.
1982; 18 (3): 289-296
- **CLONING OF RHIZOBIUM-MELILOTI NODULATION GENES BY DIRECT COMPLEMENTATION OF NOD- MUTANTS** *NATURE*
Long, S. R., Buikema, W. J., Ausubel, F. M.
1982; 298 (5873): 485-488

- MOLECULAR-GENETICS OF SYMBIOTIC NITROGEN-FIXATION *COLD SPRING HARBOR SYMPOSIA ON QUANTITATIVE BIOLOGY*
RUVKUN, G. B., Long, S. R., Meade, H. M., Ausubel, F. M.
1980; 45: 492-499