



## 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

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### Bio

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#### 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

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### CURRENT RESEARCH AND SCHOLARLY INTERESTS

Biochemistry, genetics and cell biology of plant-bacterial symbiosis

## Teaching

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### COURSES

#### 2025-26

- Integrative and Experimental Microbiology: BIO 120, BIO 220 (Spr)
- Microbiology Literature: BIO 178, BIO 278 (Win)

#### 2024-25

- Integrative and Experimental Microbiology: BIO 120, BIO 220 (Spr)

#### 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)

## STANFORD ADVISEES

### Doctoral Dissertation Reader (AC)

Brianna Johnson, Janie Kim, Steven Massa, Carin Ragland

### Undergraduate Major Advisor

Morgan Clark

## GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

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

## Publications

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### 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 Chv1 and a consensus sequence for Chv1 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  $\alpha$ -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., Griffiths, 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., Rezaeiaghghi, 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., Griffiths, 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 *sun1* 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., Griffiths, 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., Rakocevic, 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 Ca<sup>2+</sup>/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  $\alpha$  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 GroESL 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*  
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