

Department of Ecology, Evolution, and Natural Resources (./)

Dr. Robert M. Goodman Profile



Office Hours: Wednesdays 11:00 a.m. to 12:30 p.m. or by appointment 848-932-3248.

Dr. Robert M. Goodman is a plant biologist and virologist who from 2005 to 2020 served as Executive Dean of Agriculture and Natural Resources at Rutgers University, executive dean of the School of Environmental and Biological Sciences (<https://sebs.rutgers.edu>), executive director of the New Jersey Agricultural Experiment Station (<https://njaes.rutgers.edu>), and Distinguished Professor of Ecology, Evolution, and Natural Resources. In 2020, he was

named a University Professor by the Rutgers Board of Governors and Executive Dean Emeritus.

He studied at the Johns Hopkins University and then transferred to Cornell University, where he earned a B.S. degree in Plant Sciences in 1967. After two years of civilian service (1969–1971), he completed a Ph.D. in Plant Pathology at Cornell University in 1973. He was awarded a NATO postdoctoral fellowship by the National Science Foundation for study in molecular virology at the John Innes Institute in Norwich, England. In 1974, he was appointed Assistant Professor at the University of Illinois at Urbana-Champaign, and later promoted to Associate Professor in 1978 and Professor in 1981. Notable work during his years at Illinois were the discovery and characterization of the Geminiviruses, the first-known circular, single stranded DNA viruses in plants. He was also a member of the AID-funded International Soybean Program.

In 1982, Goodman was named Vice President, and thereafter Executive Vice President, for Research and Development at Calgene, Inc., an early plant biotechnology company and one of the pioneers in the genetic engineering of crop species, notably pesticide resistance and the use of anti-sense RNA to modify crop traits.

From 1991 to 2005, he was a professor of plant pathology and environmental studies at the University of Wisconsin-Madison, where his laboratory carried out pioneering work on the diversity of soil microorganisms refractory to cultivation and co-developed the approach for microbial ecology studies now widely called metagenomics.

He is widely published in scientific journals such as *Science*, *Nature*, *Virology*, and the *Proceedings of the National Academy of Sciences* on topics including soil metagenomics, the discovery of the geminiviruses, and characterization of unexpected Archaeal and Eubacterial clades in soil.

In addition to his executive roles at Calgene, Inc., and Rutgers, Goodman has served in several other senior leadership positions, including the Board of Trustees of the International Center for Maize and Wheat Improvement (CIMMYT) where he chaired the Program Committee, chair of the Agriculture, Food and Natural Resources section of the American Association for the Advancement of Sciences (AAAS), and founder and chair of the Oversight Committee for the McKnight Foundation's **Collaborative Crop Research Program**. At Wisconsin he chaired the undergraduate major in molecular biology. He also has experience as a member of Boards of Directors of several small publicly-traded and private startup companies, including two initial public offerings.

Since his first faculty appointment to the International Soybean Program at the University of Illinois at Urbana-Champaign in 1974, Goodman's scholarship has included an international dimension. In the early 1990s, he was invited by the McKnight Foundation to lead the creation of a new program that became the **Collaborative Crop Research Program** (CCRP). In its initial phase, the program solicited and funded proposals initiated and led by leading crop research groups based in selected less developed countries of Africa, Asia, and the Americas. An innovation in global agricultural research at the time, these grants funded partnerships led by scientists based in the global South with scientists in institutions in the North to conduct research on understudied crops that underpin food and nutritional security. The first phase of this program is described by Richard Manning in *"Food's Frontier: The Next Green Revolution"* (University of California Press, Berkeley, 2001). Over time, as this program grew, it also shifted to an increasing focus on using community-based agroecological studies by farmer-centered, communities of practice in Africa and the Americas. Goodman led the Oversight Committee for the CCRP until 2005 when he moved to Rutgers. In 2023, the McKnight Foundation again renewed its commitment to this work and renamed the program **"Global Collaboration for Resilient Food Systems"**.

In 2013, Goodman was invited to a conversation with the Stavros Niarchos Foundation regarding the Foundation's program **"Recharging the Youth"** that focused on redressing the dire issue of youth unemployment in Greece. After a pilot study of opportunities to engage youth in the agrifood sector of Greece, Rutgers proposed and the SNF funded a major grant to implement youth workforce development and entrepreneurship. The initial phase of this work, called **"New Agriculture for a New Generation"**, was conducted by a Rutgers-led team based in and employing Greek staff and partnerships with Greek public and private sector partners. In 2021, a new civil society not-for-profit company, **"New Agriculture New Generation"** (**NeAGeN**) was created to carry on this work, with continued technical and strategic support from Rutgers (www.generationag.org (<http://www.generationag.org>)).

He is an elected Fellow of the AAAS and of the American Academy of Microbiology.

Among his roles as University Professor, Dr. Goodman serves as a senior strategic advisor for the Clement A. Price Institute on Ethnicity, Culture, and the Modern Experience in the School of Arts and Sciences at Rutgers University–Newark. He is a member of the American Farmland Trust's New York

Council and a newly appointed member of the AFT President's Council. He serves as a member of the board of directors of Microbiota Vault Inc. He also continues his longstanding work as the Principal Investigator for the Rutgers University project with New Agriculture New Generation (NeAGeN), now a public not-for-profit company in Greece. NeAGeN's origins were in a 2013 initiative, "Recharging the Youth", of the Stavros Niarchos Foundation (SNF). SNF provided a major grant to Rutgers University to design and implement the agricultural and food system pillar of the Recharging the Youth program. Among his current activities with NeAGeN, he is working to develop curriculum for a new leadership program for the agriculture and food sectors, the first of its kind in Europe.

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Education

	School Program Degree Years
John Innes Institute, UK Plant Virology Postdoctoral Fellow 1973–1974	
Cornell University Plant Pathology Ph.D. 1973	

Cornell University

Plant Sciences

B.Sc.

1967

The Johns Hopkins University

1963–1965

Appointments

Title	Institution	Years
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University Professor and Executive Dean Emeritus

Rutgers University

2020-

Distinguished Professor

Rutgers University

2005-

Executive Dean of Agriculture and Natural Resources

Rutgers University

2005-2020

Chair, Major in Molecular Biology

University of Wisconsin-Madison

1994-2005

Co-chair, Biology Major

University of Wisconsin-Madison

1999-2001

Professor
University of Wisconsin-Madison
1991-2005

Senior Scholar-In-Residence
National Research Council/NAS
1990-1991

Visiting Professor
University of Wisconsin-Madison
1990-1991

Executive Vice President, R&D
Calgene, Inc., Davis, CA
1982-1990

Professor
University of Illinois-Urbana
1981-1982

Associate Professor
University of Illinois-Urbana
1978-1981

Assistant Professor
University of Illinois-Urbana
1974-1978

Honors

- Fellow, American Academy of Microbiology (AAM) 2011
- Vilas Trust Associate, University of Wisconsin-Madison (2000)
- Fellow, American Association for the Advancement of Science (AAAS) (2002)

Publications

Note: Total number of publications since 1967 in refereed journals is 116.

Key Publications, 1977–2011

- **Goodman, R. M.** 1977. Infectious DNA from a whitefly-transmitted virus of *Phaseolus vulgaris*. *Nature* 266:54-55. [Doi: 10.1038/266054a0](https://doi.org/10.1038/266054a0) (<https://doi.org/10.1038/266054a0>)
- **Goodman, R. M.** 1977. Single-stranded DNA genome in a whitefly-transmitted plant virus. *Virology* 83:171-179. [Doi: 10.1016/0042-6822\(77\)90220-3](https://doi.org/10.1016/0042-6822(77)90220-3) ([https://doi.org/10.1016/0042-6822\(77\)90220-3](https://doi.org/10.1016/0042-6822(77)90220-3))
- Haber, S., M. Ikegami, N. B. Bajet, and **R. M. Goodman**. 1981. Evidence for a divided genome in bean golden mosaic virus, a geminivirus. *Nature* 289:324-326. [Doi: 10.1038/289324a0](https://doi.org/10.1038/289324a0) (<https://doi.org/10.1038/289324a0>)
- Ikegami, M., S. Haber, and **R. M. Goodman**. 1981. Isolation and characterization of virus-specific double-stranded DNA from tissues infected by bean golden mosaic virus. *Proc. Natl. Acad. Sci. USA* 78:4102-4106. [Doi: 10.1073/pnas.78.7.4102](https://doi.org/10.1073/pnas.78.7.4102) (<https://doi.org/10.1073/pnas.78.7.4102>)
- Howarth, A. J., J. Caton, M. Bossert, and **R. M. Goodman**. 1985. Nucleotide sequence of bean golden mosaic virus and a model for gene regulation in geminiviruses. *Proc. Natl. Acad. Sci. USA* 82:3572-3576. [Doi: 10.1073/pnas.82.11.3572](https://doi.org/10.1073/pnas.82.11.3572) (<https://doi.org/10.1073/pnas.82.11.3572>)
- **Goodman, R. M.**, H. Hauptli, A. Crossway, and V. C. Knauf. 1987. [Gene transfer in crop improvement. \(PDF\)](#) ([pdfs/godman-k06.pdf](https://pdfs.godman-k06.pdf)) *Science* 236:48-54.
- Alexander, D., **R. M. Goodman**, M. G. Rella, C. Glascock, K. Weymann, L. Friedrich, D. Maddox, P. Ahl Goy, T. Luntz, E. Ward, and J. Ryals. 1993. [Increased tolerance to two oomycete pathogens in transgenic tobacco expressing pathogenesis-related protein 1a. \(PDF\)](#) (pdfs/godman-k07.pdf) *Proc. Natl. Acad. Sci. USA* 90:7327-7331.
- **Goodman, R. M.** 1997. [Ensuring the scientific foundations for agriculture's future. \(pdfs/lockeretz.pdf\)](#) Pages 187-203 in Lockeretz, W .ed. *Visions of American Agriculture. (PDF)* Iowa State University Press, Ames.

- Bintrim, S. B., T. J. Donohue, J. Handelsman, G. P. Roberts, and **R. M. Goodman**. 1997. Molecular phylogeny of Archaea from soil. (PDF)_(pdfs/goodman-k08.pdf) *Proc. Natl. Acad. Sci. USA* 94:277-282.
- Schrenk, M. O., K. J. Edwards, **R. M. Goodman**, R. J. Hamers, and J. F. Banfield. 1998. Distribution of Thiobacillus ferrooxidans and Leptospirillum ferrooxidans: Implications for generation of acid mine drainage. (PDF)_(pdfs/goodman-k09.pdf) *Science* 279:1519-1522.
- Handelsman, J., M. R. Rondon, S. Brady, J. Clardy, and **R. M. Goodman**. 1998. Molecular biological access to the chemistry of unknown soil microbes: A new frontier for natural products. (PDF)_(pdfs/goodman-k10.pdf) *Chem. Biol.* 5:R245-249.
- Smith, K. P., J. Handelsman, and **R. M. Goodman**. 1999. Genetic basis in plants for interactions with disease-suppressive bacteria. (PDF)_(pdfs/goodman-k11.pdf) *Proc. Natl. Acad. Sci. USA* 96:4786-4790.
- Rondon, M. R., S. J. Raffel, **R. M. Goodman**, and J. Handelsman. 1999. Toward functional genomics in bacteria: Analysis of gene expression in Escherichia coli from a bacterial artificial chromosome (BAC) library of Bacillus cereus DNA. (PDF)_(pdfs/goodman-k12.pdf) *Proc. Natl. Acad. Sci. USA* 96:6451-6455.
- J. Handelsman, M. Liles, D. Mann, C. Riesenfeld, and **R. M. Goodman**. 2002. Cloning the metagenome: culture-independent access to the diversity and functions of the uncultivated microbial world. *Methods Microbiol.* 33: 241-255.
- **Goodman, R. M.**, R. Naylor, H. Tefera, and W. Falcon. 2002. The rice genome and the minor grains. *Science* 296: 1801-1802. Doi: 10.1126/science.296.5574.1801b
(<https://doi.org/10.1126/science.296.5574.1801b>)
- Falkowski, P. and **R. M. Goodman**. 2009. Future energy institutes. *Science* 325: 655. Doi: 10.1126/science.1176998 (<https://doi.org/10.1126/science.1176998>)
- J. W. Bennet, D. Eveleigh, and **R. M. Goodman**. 2017. H. Boyd Woodruff (1917-2017) *Science* 356: 381. Doi: 10.1126/science.aan3952 (<https://doi.org/10.1126/science.aan3952>)

All Publications, 2000–Present

69. Rondon, M. R., P. R. August, A. D. Bettermann, S. F. Brady, T. H. Grossman, M. R. Liles, K. A. Loiacono, B. A. Lynch, I. A. MacNeil, C. Minor, C. L. Tiong, M. Gilman, M. S. Osburne, J. Clardy, J. Handelsman, and **R. M. Goodman**. 2000. Cloning the soil metagenome: A strategy for accessing the genetic and functional diversity of uncultured microorganisms. (PDF)_(pdfs/goodman-069.pdf) *Appl. Environ. Microbiol.* 66:2541-2547.
70. Simon, H. M., J. Dodsworth, and **R. M. Goodman**. 2000. Crenarcheota colonize terrestrial plant roots. *Environ. Microbiol.* 2:495-505.

71. Kazmar, E. R., **R. M. Goodman**, C. R. Grau, D. W. Johnson, E. V. Nordheim, D. J. Undersander, and J. Handelsman. 2000. Regression analyses for evaluating the influence of *Bacillus cereus* on alfalfa yield under variable disease intensity. (PDF)(pdfs/goodman-071.pdf) *Phytopathology* 90:657-665.
72. Broderick, N. A., **R. M. Goodman**, K. F. Raffa, and J. Handelsman. 2000. Synergy between zwittermicin A and *Bacillus thuringiensis* subsp. *kurstaki* against gypsy moth (*Lepidoptera*: *Lymantriidae*). (PDF)(pdfs/goodman-072.pdf) *Environ. Entomol.* 29:101-107.
73. Simon, H. M., K. P. Smith, J. A. Dodsworth, B. Guenther, J. Handelsman, and **R. M. Goodman**. 2001. Influence of tomato genotype on growth of inoculated and indigenous bacteria in the spermosphere. (PDF)(pdfs/goodman-073.pdf) *Appl. Environ. Microbiol.* 67:514-520.
74. Nelson, B. P., T. E. Grimsrud, M. R. Liles, **R. M. Goodman**, and R. M. Corn. 2001. Surface plasmon resonance imaging measurements of DNA and RNA hybridization adsorption onto DNA microarrays. (PDF)(pdfs/goodman-074.pdf) *Anal. Chem.* 73:1-7.
75. Dasgupta, R., B. H. Garcia II, and **R. M. Goodman**. 2001. Systemic spread of an RNA insect virus in plants expressing plant viral movement protein genes. (PDF)(pdfs/goodman-075.pdf) *Proc. Natl. Acad. Sci. USA* 98:4910-4915.
76. Song, F., and **R. M. Goodman**. 2001. Molecular biology of disease resistance in rice. (PDF)(pdfs/goodman-076.pdf) *Physiol. Molec. Plant Pathol.* 59:1-11.
77. Song, F., and **R. M. Goodman**. 2001. Activity of nitric oxide is dependent on, but is partially required for function of salicylic acid in the signaling pathway in tobacco systemic acquired resistance. (PDF)(pdfs/goodman-077.pdf) *Molec. Plant Microbe Interact.* 14:1458-1462.
78. **R. M. Goodman**. 2001. Who owns the crops? *Issues Sci. Tech.* 18: 14-15.
79. Song, F., and **R. M. Goodman**. 2002. OsBIMK1, a rice MAP kinase gene involved in disease resistance responses. (PDF)(pdfs/goodman-078.pdf) *Planta* 215:997-1005.
80. Song, F., and **R. M. Goodman**. 2002. Molecular cloning and characterization of a rice phosphoinositide-specific phospholipase C gene, OsPI-PLC1, that is activated in systemic acquired resistance. (PDF)(pdfs/goodman-079.pdf) *Physiol. Molec. Plant Pathol.* 61:31-40.
81. Song, F., and **R. M. Goodman**. 2002. Cloning and identification of the promoter of the tobacco Sar8.2b gene, a gene involved in systemic acquired resistance. (PDF)(pdfs/goodman-080.pdf) *Gene* 290:115-124.
82. J. Handelsman, M. Liles, D. Mann, C. Riesenfeld, and **R. M. Goodman**. 2002. Cloning the metagenome: culture-independent access to the diversity and functions of the uncultivated microbial world. *Methods Microbiol.* 33: 241-255.
83. Gillespie, D. E., S. F. Brady, A. D. Bettermann, N. P. Cianciotto, M. R. Liles, M. R. Rondon, J. Clardy, **R. M. Goodman**, and J. Handelsman. 2002. Isolation of antibiotics turbomycin A and B from a

- metagenomic library of soil microbial DNA. *Appl. Environ. Microbiol.* (PDF).(pdfs/goodman-081.pdf) 68:4301-4306.
84. Nelson, B. P., M. R. Liles, K. B. Frederick, R. M. Corn, and **R. M. Goodman**. 2002. Label-free detection of 16S ribosomal RNA hybridization on reusable DNA arrays using surface plasmon resonance imaging. (PDF).(pdfs/goodman-082.pdf) *Environ. Microbiol.* 4:735-743.
85. **Goodman, R. M.**, R. Naylor, H. Tefera, and W. Falcon. 2002. The rice genome and the minor grains. *Science* 296: 1801-1802. Doi: 10.1126/science.296.5574.1801b
(<https://doi.org/10.1126/science.296.5574.1801b>)
86. Broderick, N. R., **R. M. Goodman**, J. Handelsman, and K. F. Raffa. 2003. Effect of host diet and insect source on synergy of gypsy moth (*Lepidoptera: Lymantriidae*) mortality to *Bacillus thuringiensis* subsp. *kurstaki* by zwittermicin A. (PDF).(pdfs/goodman-083.pdf) *Environ. Entomol.* 32:387-391.
87. Kapuscinski, A. R., **R. M. Goodman**, S. D. Hann, L. R. Jacobs, E. E. Pullins, C. S. Johnson, J. D. Kinsey, R. L. Krall, A. G.M. La Viña, M. G. Mellon, and V. W. Ruttan. 2003. Making "Safety First" a reality for biotechnology products. (PDF).(pdfs/goodman-084.pdf) *Nature Biotechnol.* 21:599-601.
88. Liles, M. R., B. F. Manske, S. B. Bintrim, J. Handelsman and **R. M. Goodman**. 2003. A census of rRNA genes and linked genomic sequences within a soil metagenomic library. (PDF).(pdfs/goodman-085.pdf) *Appl. Environ. Microbiol.* 69:2684-2691.
89. Stone, A. G., G. E. Vallad, L. R. Cooperband, D. Rotenberg, H. R. Darby, R. V. James, W. Stevenson, and **R. M. Goodman**. 2003. The effects of organic amendments on soil-borne and foliar diseases in a field vegetable rotation. (PDF).(pdfs/goodman-086.pdf) *Plant Disease* 87:1037-1042.
90. Broderick, N. A., K. F. Raffa, **R. M. Goodman**, and J. Handelsman. 2004. Census of the bacterial community of the gypsy moth larval midgut by using culturing and culture-independent methods. (PDF).(pdfs/goodman-087.pdf) *Appl. Environ. Microbiol.* 70:293-300.
91. Vallad, G. E., L. Cooperband, and **R. M. Goodman**. 2004. Plant foliar disease suppression mediated by composted forms of paper mill residuals exhibits molecular features of induced resistance. (PDF).(pdfs/goodman-088.pdf) *Physiol. Molec. Plant Pathol.* 63:65-77.
92. Sliwinski, M. K., and **R. M. Goodman**. 2004. Spatial heterogeneity of crenarchaeal assemblages within mesophilic soil ecosystems revealed by PCR-single stranded conformation polymorphism (PCR-SSCP) profiling. (PDF).(pdfs/goodman-089.pdf) *Appl. Environ. Microbiol.* 70:1811-1820.
93. Sliwinski, M. K., and **R. M. Goodman**. 2004. Comparison of the crenarchaeal consortia inhabiting the rhizosphere of diverse terrestrial plants with those in bulk soil in native environments. (PDF).(pdfs/goodman-090.pdf) *Appl. Environ. Microbiol.* 70:1821-1826.

94. Naylor, R. L., W. P. Falcon, **R. M. Goodman**, M. M. Jahn, T. Sengooba, H. Tefera, and R. J. Nelson. 2004. Biotechnology in the developing world: A case for increased investments in orphan crops. (pdfs/goodman-091.pdf) *Food Policy* 29:15-44.
95. Riesenfeld, C. S., **R. M. Goodman**, and J. Handelsman. 2004. Uncultured soil bacteria are a reservoir of new antibiotic resistance genes. (PDF)(pdfs/goodman-092.pdf) *Environ. Microbiol.* 6:981-989.
96. Vallad, G. E, and **R. M. Goodman**. 2004. Systemic acquired resistance and induced systemic resistance in conventional agriculture. (PDF)(pdfs/goodman-093.pdf) *Crop Sci.* 44:1920-1934.
97. Simon, H. M., C. E. Jahn, L. T. Bergerud, M. K. Sliwinski, P. J. Weimer, D. K. Willis, and **R. M. Goodman**. 2005. Cultivation of mesophilic soil crenarchaeotes in enrichment cultures from plant roots. (PDF)(pdfs/goodman-094.pdf) *Appl. Environ. Microbiol.* 71:4751-4760.
98. Luo, H., F. Song, **R. M. Goodman**, Z. Zheng. 2005. Up-Regulation of OsBIHD1, a rice gene encoding BELL homeodomain transcriptional factor, in disease resistance responses. (PDF)(pdfs/goodman-095.pdf) *Plant Biology* 7:459-468.
99. Cao, Y., F. Song, **R. M. Goodman**, Z. Zheng. 2006. Molecular characterization of four rice genes encoding ethylene-responsive transcriptional factors and their expressions in response to biotic and abiotic stress. *Journal of Plant Physiology* 163:1167-1178. Doi: 10.1016/j.jplph.2005.11.004 (<https://doi.org/10.1016/j.jplph.2005.11.004>)
100. Sabree, Z. L., V. Bergendahl, M. R. Liles, R. R. Burgess, **R. M. Goodman**, and J. Handelsman. 2006. Identification and characterization of the gene encoding the *Acidobacterium capsulatum* major sigma factor. (PDF)(pdfs/goodman-094.pdf) *Gene* 376:144-151.
101. Mentzer, J.L., **R. M. Goodman**, and T. C. Balsler. 2006. Microbial response over time to hydrologic and fertilization treatments in a simulated wet prairie. *Plant and Soil* 284:85-100. Doi: 10.1007/s11104-006-0032-1 (<https://doi.org/10.1007/s11104-006-0032-1>)
102. Gutknecht, J. L. M., **R. M. Goodman**, and T. C. Balsler. 2006. Linking soil process and molecular ecology in freshwater wetland habitats. *Plant and Soil* 289:17-34. Doi: 10.1007/s11104-006-9105-4 (<https://doi.org/10.1007/s11104-006-9105-4>)
103. Garcia, II, B. H., and **R. M. Goodman**. 2007. Use of surface plasmon resonance imaging to study viral RNA:protein interactions. *Journal of Virological Methods* 147:18-25. Doi: 10.1016/j.jviromet.2007.08.002 (<https://doi.org/10.1016/j.jviromet.2007.08.002>)
104. Kowalchuk, G. A., A. J. C. L. Speksnijder, K. Zhang, **R. M. Goodman**, and J. A. Veen. 2007. Finding the needles in the metagenome haystack. *Microbial Ecology* 53: 475-485. Doi: 10.1007/s00248-006-9201-2 (<https://doi.org/10.1007/s00248-006-9201-2>)

105. D. Rotenberg, A. J. Wells, E. J. Chapman, A. E. Whitfield, **R. M. Goodman**, and L. R. Cooperband. 2007. Soil properties associated with organic matter-mediated suppression of bean root rot in field soil amended with fresh and composted paper mill residuals. *Soil Biol. Biochem.* 39: 2936-2948. [Doi: 10.1016/j.soilbio.2007.06.011](https://doi.org/10.1016/j.soilbio.2007.06.011) (<https://doi.org/10.1016/j.soilbio.2007.06.011>)
106. Liles, M. R., L. L. Williamson, J. Rodbumrer, V. Torsvik, **R. M. Goodman**, and J. Handelsman. 2008. Recovery, purification and cloning of high molecular weight DNA from soil microorganisms. *Appl. Environ. Microbiology* 74: 3302-3305. [DOI: 10.1128/AEM.02630-07](https://doi.org/10.1128/AEM.02630-07) (<https://doi.org/10.1128/AEM.02630-07>)
107. George, I., M. R. Liles, M. Hartmann, W. Ludwig, **R. M. Goodman**, and S. Agathos. 2009. [Changes in soil *Acidobacteria* communities after 2,4,6-trinitrotoluene contamination. \(PDF\)](#) ([pdfs/FEMSLE_1632.PDF](#)) *Federation of European Microbiological Societies* 296: 159-166.
108. Falkowski, P. and **R. M. Goodman**. 2009. Future energy institutes. *Science* 325: 655. [Doi: 10.1126/science.1176998](https://doi.org/10.1126/science.1176998) (<https://doi.org/10.1126/science.1176998>)
109. Liles, M. R., L. L. Williamson, J. Rodbumrer, V. Torsvik, L. C. Parsley, **R. M. Goodman**, and J. Handelsman. 2009. Recovery, purification and cloning of high molecular weight DNA from soil microorganisms. *Cold Spring Harbor Protocols* 2009(8): .
110. Kerkhof, L. J. and **R. M. Goodman**. [Ocean microbial metagenomics \(PDF\)](#) ([pdfs/goodman-103.pdf](#)). 2009. *Deep-Sea Research II* 56:1824-1829.
111. Liles, M. R., O. Turkmen, B. Manske, M. Zhang, J. Rouillard, I. George, T. Balsler, N. Billor and **R. M. Goodman**. A phylogenetic microarray targeting 16S rRNA genes from the bacterial division *Acidobacteria* reveals a lineage-specific distribution in a soil clay fraction. 2010 *Soil Biology & Biochemistry*, 42:739-747. [Doi: 10.1016/j.soilbio.2010.01.007](https://doi.org/10.1016/j.soilbio.2010.01.007) (<https://doi.org/10.1016/j.soilbio.2010.01.007>)
112. K. S. Kakirde, J. Wild, R. Godiska, D. A. Mead, A. G. Wiggins, **R. M. Goodman**, W. Szybalski, and M. R. Liles. 2011. Gram negative shuttle BAC vector for heterologous expression of metagenomic libraries. *Gene* 475:57-62. [Doi: 10.1016/j.gene.2010.11.004](https://doi.org/10.1016/j.gene.2010.11.004) (<https://doi.org/10.1016/j.gene.2010.11.004>)
113. L. C. Parsley, J. Linneman, A. M. Goode, K. Beckland, I. George, **R. M. Goodman**, N. B. Lopanick, and M. R. Liles. 2011. Polyketide synthase pathways identified from a metagenomic library are derived from soil *Acidobacteria*. *FEMS Microbiology Ecology* 78: 176-187. [Doi: 10.1111/j.1574-6941.2011.01122.x](https://doi.org/10.1111/j.1574-6941.2011.01122.x) (<https://doi.org/10.1111/j.1574-6941.2011.01122.x>)
114. Pinto-Tomás, A. A., A. Sittenfeld, L. Uribe-Lorío, F. Chavarría, M. Mora, D. H. Janzen, **R. M. Goodman**, and H. M. Simon. Comparison of Midgut Bacterial Diversity in Tropical Caterpillars (Lepidoptera: Saturniidae) Fed on Different Diets. 2011 *Environ. Entomol.* 40(5):1111-1122. [Doi: 10.1603/EN11083](https://doi.org/10.1603/EN11083) (<https://doi.org/10.1603/EN11083>)
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