Stanford



Harley H McAdams

Professor (Research) of Developmental Biology, Emeritus

Department of Developmental Biology

CONTACT INFORMATION

- **Alternate Contact**

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Bio

ACADEMIC APPOINTMENTS

- Emeritus Faculty, Acad Council, Department of Developmental Biology
- Member, Bio-X

HONORS AND AWARDS

- Fellow, American Academy of Microbiologists (2006)
- John Scott Award, John Scott Trust, administrated by City of Philadelphia (2009)

PROFESSIONAL EDUCATION

- PhD, Rice University , Physics (1967)
- MA, Rice University , Physics (1965)
- MS, U. Illinois (Urbana) , Physics (1962)
- BS, Texas A&M , Physics (1960)

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

I am interested in the mechanisms of bacterial genetic regulation, particularly as it controls the cell cycle and localization of proteins and molecular subsystems within the bacterial cell.

My laboratory is closed now and I am emeritus faculty in the Department of Developmental Biology. Our research in previous years produced seminal papers that pointed out the stochastic nature of gene transcription and then showed through modeling and analysis the biological consequences of these phenomena. In collaboration with Lucy Shapiro's group we brought a multi-disciplinary approach to analysis of bacterial cell cycle regulation and control.

Teaching

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Developmental Biology (PhD Program)

Publications

PUBLICATIONS

- **Dynamic translation regulation in Caulobacter cell cycle control.** *Proceedings of the National Academy of Sciences of the United States of America*
  Schrader, J. M., Li, G., Childers, W. S., Perez, A. M., Weissman, J. S., Shapiro, L., McAdams, H. H.
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- **Caulobacter chromosome in vivo configuration matches model predictions for a supercoiled polymer in a cell-like confinement** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Hong, S., Toro, E., Mortensen, K. I., de la Rosa, M. A., Doniach, S., Shapiro, L., Spakowitz, A. J., McAdams, H. H.
  2013; 110 (5): 1674-1679
- **Direct inference of protein-DNA interactions using compressed sensing methods** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  AlQuraishi, M., McAdams, H. H.
  2011; 108 (36): 14819-14824
- **System-level design of bacterial cell cycle control** *146th Nobel Symposium on Systems Biology*
  McAdams, H. H., Shapiro, L.
  ELSEVIER SCIENCE BV.2009: 3984–91
- **It's a noisy business! Genetic regulation at the nanomolar scale** *TRENDS IN GENETICS*
  McAdams, H. H., Arkin, A.
  1999; 15 (2): 65-69
- **Stochastic kinetic analysis of developmental pathway bifurcation in phage lambda-infected Escherichia coli cells** *GENETICS*
  Arkin, A., Ross, J., McAdams, H. H.
  1998; 149 (4): 1633-1648
- **Stochastic mechanisms in gene expression** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  McAdams, H. H., Arkin, A.
  1997; 94 (3): 814-819
- **CIRCUIT SIMULATION OF GENETIC NETWORKS** *SCIENCE*
  McAdams, H. H., Shapiro, L.
  1995; 269 (5224): 650-656
- **Cell cycle progression in Caulobacter requires a nucleoid-associated protein with high AT sequence recognition** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Ricci, D. P., Melfi, M. D., Lasker, K., Dill, D. L., McAdams, H. H., Shapiro, L.
  2016; 113 (40): E5952-E5961
- **CauloBrowser: A systems biology resource for Caulobacter crescentus.** *Nucleic acids research*
  Lasker, K., Schrader, J. M., Men, Y., Marshik, T., Dill, D. L., McAdams, H. H., Shapiro, L.
  2016; 44 (D1): D640-5
- **The global regulatory architecture of transcription during the Caulobacter cell cycle.** *PLoS genetics*
  Zhou, B., Schrader, J. M., Kalogeraki, V. S., Abeliuk, E., Dinh, C. B., Pham, J. Q., Cui, Z. Z., Dill, D. L., McAdams, H. H., Shapiro, L.
  2015; 11 (1)
- **The Global Regulatory Architecture of Transcription during the Caulobacter Cell Cycle.** *PLoS genetics*

Zhou, B., Schrader, J. M., Kalogeraki, V. S., Abeliuk, E., Dinh, C. B., Pham, J. Q., Cui, Z. Z., Dill, D. L., McAdams, H. H., Shapiro, L.
2015; 11 (1)

- **The coding and noncoding architecture of the Caulobacter crescentus genome.** *PLoS genetics*
  Schrader, J. M., Zhou, B., Li, G., Lasker, K., Childers, W. S., Williams, B., Long, T., Crosson, S., McAdams, H. H., Weissman, J. S., Shapiro, L.
  2014; 10 (7)
- **The Coding and Noncoding Architecture of the Caulobacter crescentus Genome.** *PLoS genetics*
  Schrader, J. M., Zhou, B., Li, G., Lasker, K., Childers, W. S., Williams, B., Long, T., Crosson, S., McAdams, H. H., Weissman, J. S., Shapiro, L.
  2014; 10 (7)
- **The functions of DNA methylation by CcrM in Caulobacter crescentus: a global approach.** *Nucleic acids research*
  Gonzalez, D., Kozdon, J. B., McAdams, H. H., Shapiro, L., Collier, J.
  2014; 42 (6): 3720-3735
- **Global methylation state at base-pair resolution of the Caulobacter genome throughout the cell cycle.** *Proceedings of the National Academy of Sciences of the United States of America*
  Kozdon, J. B., Melfi, M. D., Luong, K., Clark, T. A., Boitano, M., Wang, S., Zhou, B., Gonzalez, D., Collier, J., Turner, S. W., Korlach, J., Shapiro, L., McAdams, et al
  2013; 110 (48): E4658-67
- **Global methylation state at base-pair resolution of the Caulobacter genome throughout the cell cycle.** *Proceedings of the National Academy of Sciences of the United States of America*
  Kozdon, J. B., Melfi, M. D., Luong, K., Clark, T. A., Boitano, M., Wang, S., Zhou, B., Gonzalez, D., Collier, J., Turner, S. W., Korlach, J., Shapiro, L., McAdams, et al
  2013; 110 (48): E4658-67
- **Three enhancements to the inference of statistical protein-DNA potentials** *PROTEINS-STRUCTURE FUNCTION AND BIOINFORMATICS*
  AlQuraishi, M., McAdams, H. H.
  2013; 81 (3): 426-442
- **Deciphering the Transcriptional Landscape of Caulobacter crescentus at Base Pair Resolution** *11th International Conference on Computational Methods in Systems Biology (CMSB)*
  Zhou, B., Schrader, J., Christen, B., McAdams, H., Shapiro, L.
  SPRINGER-VERLAG BERLIN.2013: 247–247
- **Compaction and transport properties of newly replicated Caulobacter crescentus DNA** *MOLECULAR MICROBIOLOGY*
  Hong, S., McAdams, H. H.
  2011; 82 (6): 1349-1358
- **The Three-Dimensional Architecture of a Bacterial Genome and Its Alteration by Genetic Perturbation** *MOLECULAR CELL*
  Umbarger, M. A., Toro, E., Wright, M. A., Porreca, G. J., Bau, D., Hong, S., Fero, M. J., Zhu, L. J., Marti-Renom, M. A., McAdams, H. H., Shapiro, L., Dekker, J., Church, et al
  2011; 44 (2): 252-264
- **The essential genome of a bacterium** *MOLECULAR SYSTEMS BIOLOGY*
  Christen, B., Abeliuk, E., Collier, J. M., Kalogeraki, V. S., Passarelli, B., Coller, J. A., Fero, M. J., McAdams, H. H., Shapiro, L.
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- **Assembly of the Caulobacter cell division machine** *MOLECULAR MICROBIOLOGY*
  Goley, E. D., Yeh, Y., Hong, S., Fero, M. J., Abeliuk, E., McAdams, H. H., Shapiro, L.
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- **The Architecture and Conservation Pattern of Whole-Cell Control Circuitry** *JOURNAL OF MOLECULAR BIOLOGY*
  McAdams, H. H., Shapiro, L.
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- **Regulatory Response to Carbon Starvation in Caulobacter crescentus** *PLOS ONE*
  Britos, L., Abeliuk, E., Taverner, T., Lipton, M., McAdams, H., Shapiro, L.
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  Goley, E. D., Yeh, Y., McAdams, H., Shapiro, L.
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- **The Caulobacter Tol-Pal Complex Is Essential for Outer Membrane Integrity and the Positioning of a Polar Localization Factor** *JOURNAL OF BACTERIOLOGY*
  Yeh, Y., Comolli, L. R., Downing, K. H., Shapiro, L., McAdams, H. H.
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  Bowman, G. R., Comolli, L. R., Gaietta, G. M., Fero, M., Hong, S., Jones, Y., Lee, J. H., Downing, K. H., Ellisman, M. H., McAdams, H. H., Shapiro, L.
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- **High-throughput identification of protein localization dependency networks** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Christen, B., Fero, M. J., Hillson, N. J., Bowman, G., Hong, S., Shapiro, L., McAdams, H. H.
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- **Why and How Bacteria Localize Proteins** *SCIENCE*
  Shapiro, L., McAdams, H. H., Losick, R.
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- **Dynamic chromosome organization and protein localization coordinate the regulatory circuitry that drives the bacterial cell cycle.** *Cold Spring Harbor symposia on quantitative biology*
  Goley, E. D., Toro, E., McAdams, H. H., Shapiro, L.
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- **Architecture and inherent robustness of a bacterial cell-cycle control system** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Shen, X., Collier, J., Dill, D., Shapiro, L., Horowitz, M., McAdams, H. H.
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- **Small non-coding RNAs in Caulobacter crescentus** *MOLECULAR MICROBIOLOGY*
  Landt, S. G., Abeliuk, E., McGrath, P. T., Lesley, J. A., McAdams, H. H., Shapiro, L.
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- **A DNA methylation ratchet governs progression through a bacterial cell cycle** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Collier, J., McAdams, H. H., Shapiro, L.
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- **High-throughput identification of transcription start sites, conserved promoter motifs and predicted regulons** *NATURE BIOTECHNOLOGY*
  McGrath, P. T., Lee, H., Zhang, L., Iniesta, A. A., Hottes, A. K., Tan, M. H., Hillson, N. J., Hu, P., Shapiro, L., McAdams, H. H.
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- **Systems biology of Caulobacter** *ANNUAL REVIEW OF GENETICS*
  Laub, M. T., Shapiro, L., McAdams, H. H.
  2007; 41: 429-441
- **Graemlin: General and robust alignment of multiple large interaction networks** *GENOME RESEARCH*

Flannick, J., Novak, A., Srinivasan, B. S., McAdams, H. H., Batzoglou, S.
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- **Bacterial stalks are nutrient-scavenging antennas** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
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- **A dynamically localized protease complex and a polar specificity factor control a cell cycle master regulator** *CELL*
  McGrath, P. T., Iniesta, A. A., Ryan, K. R., Shapiro, L., McAdams, H. H.
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- **Cytokinesis signals truncation of the PodJ polarity factor by a cell cycle-regulated protease** *EMBO JOURNAL*
  Chen, J. C., Hottes, A. K., McAdams, H. H., McGrath, P. T., Viollier, P. H., Shapiro, L.
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- **Integrated Protein Interaction Networks for 11 Microbes** *Proceedings of the Tenth Annual International Conference on Computational Molecular Biology, (RECOMB 2006)*
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- **Integrated protein interaction networks for 11 microbes** *10th Annual International Conference on Research in Computational Molecular Biology*
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- **Whole-genome transcriptional analysis of heavy metal stresses in Caulobacter crescentus** *JOURNAL OF BACTERIOLOGY*
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  M. T. Laub, Lucy Shapiro, Harley McAdams
  2005
- **Integrated Protein Interaction Networks for 230 Microbes** *BCATS*
  Srinivasan, B., A. F. Novak, J. A. Flannick, S. Batzoglou, H. H. McAdams
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  McAdams, H. H., Srinivasan, B., Arkin, A. P.
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