

GREGORY D. BOWMAN

T.C. Jenkins Department of Biophysics – Johns Hopkins University
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Education and Professional Experience

- 2013 – present Associate Professor Johns Hopkins University
Department of Biophysics
Baltimore, MD
Structural and functional studies of chromatin remodelers
- 2005 – 2013 Assistant Professor Johns Hopkins University
Department of Biophysics
Baltimore, MD
Structural and functional studies of chromatin remodelers
- 2001 – 2005 Postdoctoral Fellow University of California, Berkeley
Laboratory of Dr. John Kuriyan
Department of Cell and Molecular Biology
Berkeley, CA
Structural analysis of a sliding DNA clamp-clamp loader complex
- 1994 – 2001 Ph.D., Molecular Biology Princeton University
Laboratory of Dr. C.E. Schutt
Princeton, NJ
Structural studies of actin depolymerizing factor 1 and rotaviral protein NSP4
- 1990 – 1994 B.S., Biology (Summa Cum Laude) University of North Carolina, Chapel Hill
Chapel Hill, NC

Awards and Honors

- 1993 Phi Beta Kappa
- 2002 – 2004 Ruth L. Kirschstein National Research Service Award (postdoctoral fellowship)

Selected Publications (of 42)

- Winger J., Nodelman I.M., Levendosky R.F., **Bowman G.D.** (2018) A twist defect mechanism for ATP-dependent translocation of nucleosomal DNA. *eLife*, 7:e34100 DOI: 10.7554/eLife.34100
- Tokuda J.M., Ren R., Levendosky R.F., Tay R.J., Yan M., Pollack L.*, **Bowman G.D.*** (2018) The ATPase motor of the Chd1 chromatin remodeler stimulates DNA unwrapping from the nucleosome. *Nucleic Acids Res.* 46(10):4978-4990. *co-corresponding

- Nodelman I.M., Bleichert F., Patel A., Ren R., Horvath K.C., Berger J.M., **Bowman G.D.** (2017) Interdomain communication of the Chd1 chromatin remodeler across the DNA gyres of the nucleosome. *Mol Cell*. 65(3):447-459.
- Winger J., **Bowman G.D.** (2017) The Sequence of Nucleosomal DNA Modulates Sliding by the Chd1 Chromatin Remodeler. *J Mol Biol*. 429(6):808-822.
- Levendosky R.F., Sabantsev A., Deindl S., **Bowman G.D.** (2016) The Chd1 chromatin remodeler shifts hexasomes unidirectionally. *eLife* 2016;10.7554/eLife.21356.
- Nodelman I.M., Horvath K.C., Levendosky R.F., Winger J., Ren R., Patel A., Li M., Wang M.D., Roberts E., **Bowman G.D.** (2016) The Chd1 chromatin remodeler can sense both entry and exit sides of the nucleosome. *Nucleic Acids Res*. 44(16):7580-91. doi: 10.1093/nar/gkw406. PMCID: PMC5027475.
- McKnight J.N.*, Tsukiyama T., **Bowman G.D.*** (2016) Sequence-targeted nucleosome sliding *in vivo* by a hybrid Chd1 chromatin remodeler. *Genome Res*. 26: 693-704. PMCID: PMC4864466
*co-corresponding
- Bowman, G.D.**, Porier, M.G. (2015) Post-Translational Modifications of Histones that Influence Nucleosome Dynamics. *Chem Rev*. 115(6):2274-95.(review) PMCID: PMC4375056
- Nodelman, I.M., **Bowman, G.D.** (2013) Nucleosome sliding by Chd1 does not require rigid coupling between DNA-binding and ATPase domains. *EMBO Reports*, 14(12):1098-103. PMCID: PMC3981083
- Patel, A., Chakravarthy, S., Morrone, S., Nodelman, I.M., McKnight, J.N., **Bowman, G.D.** (2013) Decoupling nucleosome recognition from DNA binding dramatically alters the properties of the Chd1 chromatin remodeler. *Nucleic Acid Res*. 41(3):1637-48. PMID: 23275572
- McKnight J.N., Jenkins, K.R., Nodelman I.M., Escobar T., **Bowman, G.D.** (2011) Extranucleosomal DNA binding directs nucleosome sliding by Chd1. *Mol Cell Biol*. 31(23): 4746-59. PMCID: PMC3232923
- Sharma, A., Jenkins, K.R., Héroux, A., **Bowman, G.D.** (2011) Crystal structure of the chromo-helicase-DNA-binding protein 1 (Chd1) DNA-binding domain in complex with DNA. *J Biol Chem*. 286(49): 42099-104. PMCID: PMC3234930
- Hauk, G.*, McKnight, J.*, Nodelman, I.M., **Bowman, G.D.** (2010) The chromodomains of the Chd1 chromatin remodeler regulate DNA access to the ATPase motor. *Mol Cell*. 39(5):711-23. PMCID: PMC2950701. Evaluated in Faculty of 1000. * equal contribution
- Bowman, G.D.**, O'Donnell, M., Kuriyan, J. (2004). Structural analysis of a eukaryotic sliding DNA clamp-clamp loader complex. *Nature*. 429(6993):724-30. PMID: 15201901

Research SupportOngoing:

- 9/01/2017 – 4/30/2021 National Institutes of Health, NIGMS 5R01GM084192-05
“Structural and Functional Analysis of the Chd1 Chromatin Remodeler”
PI: Bowman
- 7/10/2014 – 4/30/2019 National Institutes of Health, NIGMS R01GM113240
“Information Fusion in Biomolecular Structure And Motion Determination”
PI: Chirikjian

Completed:

- 4/01/2008 – 4/30/2017 National Institutes of Health, NIGMS 5R01GM084192-05
“Structural and Functional Analysis of the Chd1 Chromatin Remodeler”
PI: Bowman
- 1/1/2014 – 12/31/2015 National Cancer Institute, R21CA181751
“Structural Studies of the Tumor M2 Isoform of Pyruvate Kinase”
PI: Bowman & Lee
- 3/1/2013 – 2/28/2014 Johns Hopkins University, Technology Center for Networks, Pathways and
Dynamics of Lysine Modification
“Identification of Chd1-nucleosome interactions using crosslinking and mass
spectrometry”
PI: Boeke (Bowman sub-award)
- 9/30/2009 – 8/31/2011 National Institutes of Health, NIGMS 5R01GM084192-S1
“Structural and Functional Analysis of the Chd1 Chromatin Remodeler”
PI: Bowman
- 7/01/2007 – 6/30/2008 American Cancer Society, ACS IRG-58-005-43
“Structural and Functional Analysis of Chromatin”
PI: Casero
- (DECLINED)
1/1/2008 – 12/31/2011 American Cancer Society, Research Scholar Grant
“Structural and Functional Analysis of the Chd1 Chromatin Remodeler”
PI: Bowman

Professional Activities

2015 Feb	NIH Study Section Ad-Hoc member, MGA
2015 July	NIH Study Section Ad-Hoc member, ZRG1 GGG-A Special Emphasis Panel
2015 Oct	NIH Study Section Ad-Hoc member, MGA
2016 Nov	NIH Study Section Ad-Hoc member, ZRG1 GGG-R Special Emphasis Panel
2013, 2017	review panel member for the German Research Foundation (DFG), University of Munich Collaborative Research Centre
2009 – present	structural biology proposal reviewer for the Berkeley Advanced Light Source
2002 – present	manuscript reviewer for <i>Biophysical Journal</i> , <i>Cell</i> , <i>EMBO</i> , <i>Journal of Molecular Biology</i> , <i>Molecular Cell</i> , <i>Molecular and Cellular Biology</i> , <i>Nature</i> , <i>Nature Structural and Molecular Biology</i> , <i>Nucleic Acids Research</i> , <i>PLoS Genetics</i> , <i>PNAS</i> , <i>Proteins</i> , <i>Science</i> , <i>Structure</i> , and <i>Trends in Microbiology</i> .

Meeting co-organizer

2012 – 2018	Telluride Research Conference: Chromatin Structure and Dynamics, Telluride, CO.
2010, 2015	Mid-Atlantic Protein Crystallography Meetings, Baltimore, MD.

Community outreach

2010 – 2015	Faculty Supervisor for Hopkins Biophysics group for the USA Science & Engineering Festival, Washington DC.
2011 – 2016	Guest lecturer for the Biophysical Society Summer Course at UNC-Chapel Hill for minority students.