

# Karl Andrew Johnson

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## Professional Experience

2007-present *Professor*, Department of Biology, Haverford College  
2009-2012 *Chair*, Department of Biology, Haverford College  
2001-2004 *Chair*, Department of Biology, Haverford College  
1999-2007 *Associate Professor*, Department of Biology, Haverford College  
1993-1999 *Assistant Professor*, Department of Biology, Haverford College  
1992 *Visiting Assistant Professor*, Yale College (Summer Programs)  
1992 *Visiting Assistant Professor*, Connecticut College (Spring Semester)  
1991 *Lecturer in Biology*, Yale University (Fall Semester)

## Education

1989-1993 *Postdoctoral Fellow*, Yale University  
Advisor: Joel Rosenbaum, Ph.D.  
1989 *Ph.D. in Biology*, Yale University  
Advisor: Ian Sussex, Ph.D.  
1987 *M.Phil. in Biology*, Yale University  
Advisor: Mary Helen Goldsmith, Ph.D.  
1983 *B.A. in Biology*, Swarthmore College  
Senior Research Advisor: Mark Jacobs, Ph.D.

## Grants (1999-present)

2008-2012 National Science Foundation RUI Research Grant  
Phage-Based Components for Nanoscale Assembly  
\$180,000 (to K.A.J.)  
2009-2012 National Science Foundation MRI Instrumentation Grant  
Acquisition of Molecular and Cellular Imaging Instrumentation  
\$996,294 (co-PI)  
2000-2005 National Science Foundation RUI Research Grant  
Tubulin Folding and Assembly in *Chlamydomonas*  
\$247,000 (MCB-9982733 to K.A.J.)  
2000-2006 David and Lucille Packard Foundation Grant  
Protein-Based Biomaterials for Nanotechnology  
\$966,020 (co-PI)  
2000-2002 National Science Foundation Instrumentation Grant  
RUI: Advanced Microscopy and Manipulation Cluster for Biological and  
Biophysical Studies. \$169,271 (DBI-0070361, co-PI)  
2000-2002 National Science Foundation Instrumentation Grant  
A Confocal Microscope for Research in the Biological Sciences

	\$165,985 (DBI-0070046, co-PI)
1999-2000	Zimmer Corporation Instrumentation Grant Atomic Force Microscopy \$100,000 (co-PI)
1995-1999	National Science Foundation RUI Research Grant Characterization of a Molecular Chaperone in the Eukaryotic Flagellum \$240,000 (MCB-9506236 to K.A.J.)

And participation in program grants to Haverford College from the Howard Hughes Medical Institute, the Merck Foundation, the Sherman Fairchild Foundation, and the Beckman Foundation

### Awards, Honors and Fellowships (1999-present)

2012-2013	Accrued Sabbatical Research Leave (half-time)
2011	Video Award, American Physical Society Division of Fluid Dynamics (collaborative product with Guasto, J. and Gollub J.)
2008-2009	Accrued Sabbatical Research Leave (half-time)
2004-2005	Accrued Sabbatical Research Leave (half-time)
2001-2002	Teaching with Technology Development Award, Haverford College
2000-2001	Post-Tenure Leave (full time)
1999	Faculty Innovation in Teaching Award, Haverford College

### Courses Taught at Haverford (1999-present)

HBiol 123	<i>Perspectives in Biology: Scientific Literacy</i> - a class for nonscientists
HBiol 200	<i>Cell Structure and Function</i> – a year long, team-taught gateway to the major
HBiol 300	<i>Laboratory in Biochemistry/Molecular Biology</i> – intensive co-taught junior laboratory
HBiol 302	<i>Cell Architecture</i> - a junior-level cell biology lecture course
HBiol 351	<i>Molecular Motors and Biological Nanomachines</i> - a literature-based senior seminar
HBiol 407	<i>Senior Research in BioArchitecture</i> – senior research theses
HBiol 499	<i>Senior Departmental Studies</i> – a senior collective experience

### Publications from Haverford (\* denotes undergraduate co-authors)

- Kokona B., **Johnson KA**, Fairman R (2014) The Effect of Coiled-Coil Flanking Sequences on the Morphology of Polyglutamine-Containing Fibrils (in preparation)
- Kurtuldu H, Tam D, Hosoi, AE, **Johnson KA**, Gollub, JP (2013) Flagellar Waveform Dynamics of Freely Swimming Algal Cells Phys. Rev. E **88**, 013015 DOI: [10.1103/PhysRevE.88.013015](https://doi.org/10.1103/PhysRevE.88.013015)
- Kurtuldu H, Guasto JS, **Johnson KA**, Gollub JP. (2011) Enhancement of biomixing by swimming algal cells in two-dimensional films. Proc Natl Acad Sci U S A. 2011 Jun 28;108(26):10391-5. PMID: [21659630](https://pubmed.ncbi.nlm.nih.gov/21659630/)
- Guasto JS, , Gollub JP (2011) Measuring Oscillatory Velocity Fields Due to Swimming Algae. Phys. Fluids 23:091112. DOI: [10.1063/1.3640006](https://doi.org/10.1063/1.3640006)
- Guasto JS, **Johnson KA**, Gollub JP. (2010) Oscillatory flows induced by microorganisms swimming in two dimensions. Phys Rev Lett. 105(16):168102. PMID: [21231018](https://pubmed.ncbi.nlm.nih.gov/21231018/)
- Kokona B, \*Kim AM, \*Roden RC, \*Daniels JP, \*Pepe-Mooney BJ, \*Kovacic BC, de Paula JC, **Johnson KA**, Fairman R. (2009) Self Assembly of Coiled-Coil Peptide-Porphyrin Complexes. Biomacromolecules. 2009 Apr 17. PMID: [19374349](https://pubmed.ncbi.nlm.nih.gov/19374349/)

- \*Shapiro J, \*Ingram J, **Johnson KA** (2005) Characterization of a molecular chaperone present in the eukaryotic flagellum. *Eukaryot Cell*. 4(9):1591-4. PMID: [16151252](#)
- \*Rigotti DJ, Kokona B, \*Horne T, \*Acton EK, \*Lederman CD, **Johnson KA**, Manning RS, Kane SA, Smith WF, Fairman R. (2005) Quantitative atomic force microscopy image analysis of unusual filaments formed by the *Acanthamoeba castellanii* myosin II rod domain. *Anal Biochem*. 346(2):189-200. PMID: [16213459](#)
- Fossella J, Samant SA, Silver LM, King SM, Vaughan KT, Olds-Clarke P, **Johnson KA**, Mikami A, Vallee RB, Pilder SH. (2000) An axonemal dynein at the Hybrid Sterility 6 locus: implications for t haplotype-specific male sterility and the evolution of species barriers. *Mamm Genome*. 11(1):8-15. PMID: [10602986](#)
- Johnson KA**. (1998) The axonemal microtubules of the *Chlamydomonas* flagellum differ in tubulin isoform content. *J Cell Sci*. 1998 111(Pt 3):313-20. PMID: [9427680](#)
- \*Bloch MA, **Johnson KA**. (1995) Identification of a molecular chaperone in the eukaryotic flagellum and its localization to the site of microtubule assembly. *J Cell Sci*. 108 (Pt 11):3541-5. PMID: [8586665](#)
- Johnson, KA**. (1995) Keeping the beat: form meets function in the *Chlamydomonas* flagellum. *BioEssays* 17:847-854. DOI: [10.1002/bies.950171006](#)
- Johnson KA**. (1995) Immunoelectron microscopy. *Methods Cell Biol*. 1995;47:153-62. PMID: [7476481](#)
- Bernstein M, Beech PL, **Johnson KA**, Kozminski KG and Rosenbaum JL. (1995) New motilities and motors in the flagella of *Chlamydomonas*. In: 45th Colloquium Mosbach: The Cytoskeleton, ed. by B. Jockusch, E. Mandelkow and K. Weber. Springer-Verlag, Heidelberg, Germany, pp. 11-21.
- Johnson KA**, Haas MA, Rosenbaum JL. (1994) Localization of a kinesin-related protein to the central pair apparatus of the *Chlamydomonas reinhardtii* flagellum. *J Cell Sci*. 107 (Pt 6):1551-6. PMID: [7962197](#)

### Publications prior to Haverford

- Kozminski KG, **Johnson KA**, Forscher P, Rosenbaum JL. (1993) A motility in the eukaryotic flagellum unrelated to flagellar beating. *Proc Natl Acad Sci U S A*. 90(12):5519-23. PMID: [8516294](#)
- Johnson KA**, Rosenbaum JL. (1993) Flagellar regeneration in *Chlamydomonas*: a model system for studying organelle assembly. *Trends Cell Biol*. 3(5):156-61. PMID: [14731610](#)
- Johnson KA**, Rosenbaum JL. (1992) Polarity of flagellar assembly in *Chlamydomonas*. *J Cell Biol*. 119(6):1605-11. PMID: [1281816](#)
- Johnson KA**, Rosenbaum JL. (1992) Replication of basal bodies and centrioles. *Curr Opin Cell Biol*. 4(1):80-5. Review. PMID: [1558756](#)
- Johnson KA**, Rosenbaum JL. (1991) Basal bodies and DNA. *Trends Cell Biol*. 1(6):145-9. PMID: [14731856](#)
- Diener DR, Curry AM, **Johnson KA**, Williams BD, Lefebvre PA, Kindle KL, Rosenbaum JL. Rescue of a paralyzed-flagella mutant of *Chlamydomonas* by transformation. *Proc Natl Acad Sci U S A*. 87(15):5739-43. PMID: [2377611](#)
- Johnson KA**, Rosenbaum JL. (1990) Basal bodies of *Chlamydomonas reinhardtii* do not contain immunologically detectable DNA. *Cell*. 62(4):615-9. PMID: [2386994](#)
- Johnson KA**, Sussex IM. (1990) Genomic amplification in the cotyledon parenchyma of common bean. *Chromosoma*. 99(3):223-30. PMID: [2397660](#)
- Johnson, KA**. (1989) The cytologic and molecular analysis of the developmentally controlled increase in nuclear DNA content in the cotyledon parenchyma of common bean, *Phaseolus vulgaris*. Ph.D. Dissertation, Yale University, New Haven, CT.

## **Synergistic Activities (1999-present)**

Sharpless Hall Renovations Working Group, 2013-present

Haverford College Honors, Fellowships, and Prizes Committee, Chair 2012-2013

Ad Hoc Search Committees

Computational Biologist Search (at Bryn Mawr College) 2013-2014

Ecology Search (at Bryn Mawr College) 2011-2012

Instrument Specialist Search, 2011

Economics Search Chair, 2006-2007

Biochemistry Search (at Bryn Mawr College) 2006-2007

Physical Chemistry Search Chair, 2005-2006

Molecular and Cellular Evolution Search, 2003-2004

Ecology Search (at Bryn Mawr College) 2002-2003

Biology/Chemistry Business Manager Search, 2002

Molecular Neurobiology Search, 2001-2002

Science Librarian Search, 2000

Biology Search, 1998-1999

Histology/microscopy workshop, Garnet Valley High School AP Biology Class, 2005

Committee for Environmental Responsibility, Haverford College, 2005-2008

First Interdisciplinary Science Summer Journal Club, Haverford College, organizer, 2003

Howard Hughes Program Coordinating Committee 2002-2004

Institutional Review Board (Human Subjects), Haverford College, 2002-2004

Koshland Integrated Natural Sciences Center Steering Committee, 2002-2003

Radiation Safety Officer, Haverford College, 1999-2000

Beckman Scholars Selection Committee, 1999-2000

Distinguished Visitors Committee, 1997-2000 (Chair)

Faculty Advisor to First and Second Year Students, and Majors (annually)

Biology Department Internal Committees (Equipment, Building, Web Admin., etc.)

Ad Hoc Reviewer (Grant Applications): National Science Foundation, National Institutes of Health (Minority Biomedical Research Support Program)

Ad Hoc Reviewer (Manuscripts): Genomics, Trends in Cell Biology, Journal of Cell Science, Chromosoma

Ad Hoc Reviewer/Glossator, Personnel Cases: Haverford, Bryn Mawr, Swarthmore, Reed and Loyola Colleges

Invited contributor, Graduate Record Examination in Biochemistry, Cell and Molecular Biology