**James D. Forney**

**Professor of Biochemistry**

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Address: Department of Biochemistry
175 South University St.
Purdue University
West Lafayette, IN 47907
Telephone: (765) 494-1632
Fax: (765) 494-7897
Email: forney@purdue.edu

**Education and Training**

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|---|---|---|---|
| 1980 | B.S. | University of Texas, Austin | Zoology |
| 1984 | Ph.D. | Indiana University | Molecular Biology |
| 1985-88 | Postdoc | University of California, Berkeley | Molecular Biology |

**Professional Experience**

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|---|---|
| 1999 - present | Professor, Dept. of Biochemistry, Purdue University |
| 2008 - present | Adjunct Professor of Biochemistry and Molecular Biology, Indiana University School of Medicine |
| 2001 - 2008 | Head, Department of Biochemistry, Purdue University |
| 1994 - 1999 | Associate Professor, Dept. of Biochemistry, Purdue University |
| 1988 - 1994 | Assistant Professor, Dept. of Biochemistry, Purdue University |

**Honors**

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| 1985-1988 | Helen Hay Whitney Postdoctoral Fellowship |
| 1990-1992 | Jr. Faculty Award from American Cancer Society |
| 1997 | Top Ten Teacher in the School of Science, Purdue University |
| 1997-1998 | Outstanding Teacher, Department of Biochemistry |
| 1997 | Golden Key National Honor Society (honorary member) |
| 2008-09 | Outstanding Teacher, Department of Biochemistry |
| 2013 | Outstanding Teacher, Department of Biochemistry |
| 2013 and 2016 | Indiana University School of Medicine Trustee Teaching Award |
| 2018 | Book of Great Teachers, Purdue University |

**Memberships in Professional Societies**

American Society for Biochemistry and Molecular Biology

**Professional Activities**

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| 1995 | Co-chair Vth International Ciliate Molecular Biology Meeting (FASEB Summer Conference) |
| 1997-2000 | National Science Foundation, Eukaryotic Genetics Panel |
| 1999 | Volume Editor, *Methods in Cell Biology: Tetrahymena*. Co-editor, D. J. Asai |
| 1999-2016 | Board of Reviewers, *Journal of Eukaryotic Microbiology* |
| 2009 | External Reviewer, Virginia Tech University Department of Biochemistry |
| 2013 | National Science Foundation BIO REU panel |
| 2014 | External Reviewer, Texas A&M University, Department of Biochemistry |
| 2015 | Co-Chair, 2015 Ciliate Molecular Biology Meeting, Camerino Italy |
| 2013-2020 | ASBMB Sub-committee for Biochemistry Program Accreditation |

**Research Interests**
Molecular Biology of Differentiation: Developmentally regulated formation of the macronucleus in ciliated protozoa.

**Publications (reverse chronological order, of 35 total)**


1. Parker, L., Gleishsner, A., Adedokun, O., Forney, JD. 2016. Targeting Change: Assessing a Faculty Learning Community Focused on Increasing Statistics Content in Life Science Curricula. Biochemistry and Molecular Biology Education 44(6):517-525
2. Yang, Q, Nasir, AM, Coyne, RS, Forney JD. 2015. Depletion of UBC9 causes nuclear defects during vegetative and sexual life cycles in *Tetrahymena thermophila*. Eukaryotic Cell 14(12), 1240-1252. doi: 10.1128/EC.00115-15.
3. Nasir, AM, Yang, Q, Chalker, DL, Forney JD. 2015 SUMOylation is developmentally regulated and required for cell pairing during conjugation in *Tetrahymena thermophila*. Eukaryotic Cell 14(2), 170 -181. doi:10.1128/EC.00252-14
4. Kapusta A, Matsuda A, Marmignon A, Ku M, Silve A, Meyer E, Forney JD, Malinsky S, Betermier M. 2011. Highly Precise and Developmentally Programmed Genome Assembly in *Paramecium* Requires Ligase IV–Dependent End Joining. PLoS Genet 7(4), e1002049. doi:10.1371/journal.pgen.1002049
5. Matsuda, A., Shieh, A.W.Y., Chalker, D. and Forney JD. 2010. The conjugation specific Die5 protein is required for development of the somatic nucleus in both Paramecium and Tetrahymena. *Eukaryot. Cell* 9(7), 1087-1099.
6. Holzer TR, Mishra KK, LeBowitz JH, and Forney JD. 2008. Coordinate regulation of a family of promastigote-enriched mRNAs by the 3' UTR PRE element in *Leishmania mexicana*. *Mol. Biochem. Parasitol.* **157,** 54-64.
7. Cohen-Freue G., Holzer T., Forney J.D. and McMaster W.R. 2007. Global gene expression in *Leishmania*. *Int. J. Parasitol.* **37,** 1077-1086.
8. Matsuda A. and Forney J.D. 2006. The SUMO pathway is developmentally regulated and required for programmed DNA elimination in *Paramecium tetraurelia*. *Eukaryot. Cell* **5(5)**, 806-815.
9. Holzer T.R., McMaster W.R., Forney J.D. 2006. Expression profiling by whole-genome interspecies microarray hybridization reveals differential gene expression in procyclic promastigotes, lesion-derived amastigotes, and axenic amastigotes in Leishmania mexicana. *Mol. Biochem. Parasitol.* **146(2)**, 198-218.
10. Adhiambo C., Forney J.D., Asai D.J. and LeBowitz J.H. 2005. The two cytoplasmic dynein-2 isoforms in *Leishmania mexicana* perform separate functions. *Mol. Biochem. Parasitol.* **143(2)**, 216-225.
11. Matusda A. and Forney J.D. 2005. Analysis of *Paramecium tetraurelia A-51* Surface Antigen Gene Mutants Reveals Positive-Feedback Mechanisms for Maintenance of Expression and Temperature-Induced Activation. *Eukaryot. Cell* **4(10)**, 1613-1619.
12. Matsuda A., K. Mayer and Forney J.D. 2004. Identification of a single nucleotide mutations that prevent developmentally programmed DNA elimination in *paramecium tetraurelia*. *J. Eukaryot. Microbiol.* **51(6)**, 664-669.
13. Malavé TM and Forney J. 2004. Identification of a developmentally regulated translation elongation factor 2 in *Tetrahymena thermophila*. *Gene* **326**, 97-105.
14. Ku M, Mayer M and Forney J. 2000. Developmentally regulated excision at a 28 bp sequence from the *Paramecium* genome requires flanking DNA. *Mol. Cell. Biol.* **20**, 8390-8396.
15. Thai K and Forney JD. 2000. Analysis of the conserved cysteine periodicity of Paramecium variable surface antigens. *J. Euk. Microbiol*. **47**, 242-248.
16. Thai K and Forney JD. 1999. Evidence for transcriptional self-regulation of variable surface antigens in *Paramecium tetraurelia*. *Gene Expression* **8**, 263-272.

17. Mayer K and Forney JD. 1999. The flanking 5'-TA-3' dinucleotide is required for excision of internal eliminated sequences from the *Paramecium tetraurelia* genome. *Genetics* **151**, 597-604.
18. Mayer K, Mikami K and Forney JD. 1998. A mutation in *Paramecium tetraurelia* reveals functional and structural features of developmentally excised DNA elements. *Genetics* **148**, 139-149.
19. Forney JD. 1997. DNA rearrangements and mating-type determination in *Paramecium tetraurelia*. *BioEssays* **19**, 5-8.
20. Forney JD, Yantiri F. and Mikami K. 1996. Developmentally controlled rearrangement of surface protein genes in *Paramecium tetraurelia*. *J. Euk. Microbiol.* **43**, 462-467.
21. Leeck C and Forney J. 1996. The 5' coding region of Paramecium surface antigen genes controls mutually exclusive transcription. *Proc. Natl. Acad. Sci. USA* **93**, 2838-2843.
22. Kandl KA, Forney JD, and Asai DJ. 1995. The dynein genes of *Paramecium tetraurelia*: The structure and expression of the ciliary β and cytoplasmic heavy chains. *Mol. Biol. Cell* **6**, 1549-1562.
23. Leeck C and Forney J. 1994. The upstream region is required but not sufficient to control transcription of *Paramecium tetraurelia* surface antigen genes. *J. Biol. Chem.* **269**, 31283-31288.
24. Scott J, Leeck C and Forney J. 1994. Analysis of the micronuclear B type surface protein gene in *Paramecium tetraurelia*. *Nucl. Acids Res.* **22**, 5079-5084.
25. Scott J, Leeck C, Mikami M, and Forney J. 1994. Non-Mendelian inheritance of macronuclear mutations is gene specific in *Paramecium tetraurelia*. *Mol. Cell. Biol.* **14**, 2479-2484.
26. Asai D, Beckwith SM, Kandl KA, Keating HH, Tjandra H and Forney JD. 1994. The dynein genes of *Paramecium tetraurelia*: Sequences adjacent to the catalytic p-loop identify cytoplasmic and axonemal heavy chain isoforms. *J. of Cell Science* **107**, 8139-8147.
27. You Y, Scott J and Forney J. 1994. The role of macronuclear DNA sequences in the permanent rescue of a non-Mendelian mutation in *Paramecium tetraurelia*. *Genetics* **136**, 1319-1324.
28. Scott J, Leeck C and Forney J. 1993. Molecular and genetic analyses of the B type surface antigen in *Paramecium tetraurelia*. *Genetics* **133**, 189-198.
29. Forney J and Rodkey K. 1992. A repetitive DNA sequence in *Paramecium* macronuclei is related to the β subunit of G proteins. *Nucl. Acids Res.* **20**, 5397-5402.
30. Nielsen E, You Y and Forney J. 1991. Cysteine residue periodicity is a conserved structural feature of variable surface proteins from *Paramecium tetraurelia*. *J. Mol. Biol.* **222**, 835-841.
31. You Y, Aufderheide K, Morand J, Rodkey K, and Forney J. 1991. Macronuclear transformation with specific DNA fragments controls the content of the new macronuclear genome in *Paramecium*. *Mol. Cell. Biol.* **11**, 1133-1137.

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**Invited Reviews**

Forney J. 2000. "Developmentally Regulated DNA Elimination in *Paramecium tetraurelia*." *Japanese Journal of Protozoology*. **33**, 7-14

Clark T and Forney J. 2003. Free-living and parasitic ciliates. *Antigenic Variation* (Alister Craig and Artur Scherf, eds.) Chap 17, pp. 375-402, Academic Press, London, UK.

**Books**

Asai D.J. and Forney J.D., editors. Methods in Cell Biology Volume 62, *Tetrahymena thermophila.* Academic Press, San Diego, CA, 2000.

**Funding:**

NSF "REU Site: Molecular and Biochemical Analysis of Proteins" 2018-2021, PI James Forney, $248,700

**Invited Lectures**

Biology Department, Wabash College, September 1991. "Control of DNA Rearrangements in *Paramecium*."

Associated Colleges of the Chicago Area, Argonne National Laboratories, May 1993. "Developmental Control of DNA Rearrangements in Paramecium."

Gordon Conference "Structure and Expression of Paramecium Variable Surface Protein Genes" July 1993.

Genetics Program, University of Wisconsin, September 1994. "Developmentally Controlled DNA Rearrangements in Paramecium."

FASEB Summer Conference, Copper Mountain, CO, July 1995. "Regulation of Surface Antigen Expression in *Paramecium*."

Society of Protozoology Annual Meeting, June 1996. "Genome Rearrangement in *Paramecium tetraurelia*."

FASEB Summer Conference, Copper Mountain, CO, July 1997. "DNA Elimination in *Paramecium*."

Biology Department, Indiana University-Purdue University at Indianapolis (IUPUI), September 1997, "Developmentally Controlled DNA Elimination Events in *Paramecium*."

Department of Biology, University of Vermont, February 1998. "Developmentally Controlled DNA Elimination in *Paramecium*."

Department of Biology, Indiana University, October 1998. "Developmentally Controlled DNA Elimination in *Paramecium*."

American Society for Cell Biology, "Altering Genomes" Mini Symposium, December 1998. "Analysis of Cis Acting Sequences that Regulate Developmentally Controlled DNA Elimination in *Paramecium*."

FASEB Summer Conference. Ciliate Molecular Biology. August 1999. "DNA Elimination in *Paramecium*"

Japanese Society of Protozoology, Sendai, Japan, November 1999. Keynote speaker. "Developmentally Controlled DNA Elimination in *Paramecium.*"

FASEB Summer Conference. Ciliate Molecular Biology. July 2001. "DNA Elimination in *Paramecium*: Common Themes Within the Ciliates?"

FASEB Summer Conference Ciliate Molecular Biology. July 2003. "Developmentally Regulated DNA Elimination in *Paramecium tetraurelia*."

European Congress of Protistology and Ciliate Biology. 2003. "Developmentally Regulated DNA Elimination in *Paramecium tetraurelia*."

Boston University, Department of Genetics and Genomics, Boston, October 2003. Developmentally Regulated DNA Elimination in *Paramecium tetraurelia*"

Paramecium Genomics Meeting. Blaubeuren, Germany. October 2004. "Identification and Analysis of Genes Required for Paramecium Macronuclear Development and DNA Elimination."

University of Cincinnati. Department of Biology, October 2004. "Developmentally Controlled DNA Elimination in Paramecium."

German Society of Protozoology. Burg Lichtenberg. February 2005. "Identification and Analysis of Genes Required for DNA Elimination in *Paramecium tetraurelia*."

FASEB Summer Conference. Ciliate Molecular Biology. Lucca, Italy. August 2005. "The SUMO pathway is Developmentally Regulated and Required for Programmed DNA Elimination in *Paramecium tetraurelia*."

International Paramecium Genomics meeting. Paris, France. May 2006. "Developmentally regulated DNA elimination in Paramecium."

FASEB Summer Conference, Ciliate Molecular Biology, Tucson, AZ July, 2007. "Identification of a novel protein required for DNA elimination in diverse ciliates".

FASEB Summer Conference, Ciliate Molecular Biology, Crete, Greece. July 2011. "SUMO pathway components in Tetrahymena thermophila are essential and nuclear."

Northwest Agriculture and Forestry University, Xian, China. May 14 2014. "Multiple roles for SUMOylation in ciliated protozoa".

2015 Ciliate Molecular Biology Meeting, Camerino, Italy, July 2015. "Effects of SUMO pathway disruption in *Tetrahymena thermophila*."

2018 Ciliate Molecular Biology Meeting, Washington D.C., July 2018. "Links between cell paring and SUMOylation in *Tetrahymena thermophila*"

**Teaching Experience**

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| 1990 | Purdue University, Graduate Course, New Advances in RNA Function |
| 1990-1998 | Purdue University, Graduate Course Structure and Function of Nucleic Acids |
| 1989-2002 | Purdue University, General Biochemistry (BCHM 561) |
| 2005 | Purdue University, Seminar in Biochemistry (BCHM 490) |
| 2006-2015 | Indiana University School of Medicine, Medical Biochemistry |
| 2011-2015 | Purdue University, Experimental Design (BCHM 290) |
| 2016-present | Purdue University, Medical Topics in Biochemistry (BCHM 495) |
| 2016-present | Indiana University School of Medicine, “Molecules to Cells and Tissues” |