

James D. Forney
Professor of Biochemistry

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Education and Training

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

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

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	Indiana University Trustee Teaching Award

Memberships in Professional Societies

American Society for Biochemistry and Molecular Biology

Professional Activities

1995	Co-chair Vth International Ciliate Molecular Biology Meeting (FASEB Summer Conference)
1997-2000	National Science Foundation, Eukaryotic Genetics Panel
1999	Volume Editor, <i>Methods in Cell Biology: Tetrahymena</i> . Co-editor, D. J. Asai
1999-2007	Board of Reviewers, <i>Journal of Eukaryotic Microbiology</i>
2009	External Reviewer, Virginia Tech University Department of Biochemistry
2013	National Science Foundation BIO REU panel
2013-15	ASBMB Sub-committee for Department Accreditation

Research Interests

Molecular Biology of Differentiation: Gene Expression and DNA Rearrangements in Protozoa

Publications (reverse chronological order, of 33 total)

1. 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
2. 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.
3. 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.
4. Cohen-Freue G., Holzer T., Forney J.D. and McMaster W.R. 2007. Global gene expression in *Leishmania*. *Int. J. Parasitol.* **37**: 1077-1086.
5. 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.
6. 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.
7. 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.
8. Matsuda 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.
9. 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.
10. Malavé TM and Forney J. 2004. Identification of a developmentally regulated translation elongation factor 2 in *Tetrahymena thermophila*. *Gene* **326**, 97-105.
11. 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.
12. Thai K and Forney JD. 2000. Analysis of the conserved cysteine periodicity of *Paramecium* variable surface antigens. *J. Euk. Microbiol.* **47**, 242-248.
13. Thai K and Forney JD. 1999. Evidence for transcriptional self-regulation of variable surface antigens in *Paramecium tetraurelia*. *Gene Expression* **8**, 263-272.
14. 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.
15. 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.
16. Forney JD. 1997. DNA rearrangements and mating-type determination in *Paramecium tetraurelia*. *BioEssays* **19**, 5-8.
17. Forney JD, Yantiri F. and Mikami K. 1996. Developmentally controlled rearrangement of surface protein genes in *Paramecium tetraurelia*. *J. Euk. Microbiol.* **43**, 462-467.
18. 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.

19. 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.
20. 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.
21. 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.
22. 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.
23. 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.
24. 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.
25. 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.
26. 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.
27. 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.
28. 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.

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:

Howard Hughes Medical Institute, Undergraduate Science Education "Deviating from the Standard: Integrating Statistical Analysis and Experimental Design into Life Science Education. 9/1/2010- 8/31/2014 " \$1,500,000 total cost. PI Dennis Minchella. J. Forney Co-PI (10% effort).

NSF "REU Site: Molecular and Biochemical Analysis of Proteins" 02/15/2012-01/31/2015 \$231,589 total cost. PI James Forney (5% effort).

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."

Teaching Experience

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-present Purdue University/IUSM, Medical Biochemistry (LCME505)
2011-present Purdue University, Experimental Design (BCHM 290)

Current Graduate Students

Amjad Nasir (2008 - present)
Qianyi Yang (2009 – present)

Previous Graduate Students

Jill Scott (Ph.D. 1993) – Associate Professor of Biology at Kirkwood Community College, Cedar Rapids, Iowa.
Yun You (Ph.D. 1994) - Staff Scientist at Oak Ridge National Laboratory Tennessee.
Charles Leeck (Ph.D. 1995) - Patent Attorney, Quarles & Brady, LLP. Milwaukee, Wisconsin.
Kim Mayer (Ph.D 1999) – Goldhaber Fellow in Dept. of Biology at Brookhaven National Laboratory, Upton, New York.
Kwan Thai (Ph.D. 2000) – Research Scientist, Monsanto Corp., St. Louis, Missouri.
Tania Malavé (Ph.D. 2002) – Associate Professor of Chemistry, University of Puerto Rico, Humacao
Stacey Winfield (M.S. 2002) – currently employed by Anheuser-Busch, St. Louis, MO.
Erika Snodderley (M.S. 2003) – currently employed at Dow Elanco, Indianapolis, IN
Jennifer Pereira (M.S. 2005) – currently employed at Dow Elanco, Indianapolis, IN
Christine Adhiambo (Ph.D. 2005) – postdoc at Pasteur Institute, Paris, France.
Tim Holzer (Ph.D. 2005) – Senior Associate, Eli Lilly and Co., Indianapolis, IN
Stephanie Mowery (M.S. 2008) – AIT Biosciences, Indianapolis, IN