

CURRICULUM VITAE

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Education:

B.S. in Biology 6/67 - University of Illinois, Chicago, Illinois
Ph.D. in Cell Biology 2/72 - University of Illinois, Urbana, Illinois
Postdoctoral Research 10/71-7/75 - Genetics Dept., University of Washington, Seattle, Washington

Honors:

NIH Predoctoral Scholar
NIH Postdoctoral Scholar
Editor: Molecular and Cellular Biology (1989-2000)
Fellow: American Academy of Microbiology (1994-present)
Chair: NIH CDF-1 study section (2001-2002)
President: RNA Society (2002-2003)
Secretary: Genetics Society of America (2003-2006)
Awardee: PSU Coll. Med. Graduate Student Association "Overall Best Instructor" (2004 & 2005)
Awardee: PSU Coll. Med. Distinguished Educator 2005 Award
Awardee: PSU Distinguished Professor (2006)
Distinguished NSF-Advance Lecturer – Case Western Reserve University (2007)
Fellow: American Association for the Advancement of Science (2008-present)
Life-time Achievement in Service Award from the RNA Society (2009)
Awardee: Ohio State University Distinguished Scholar Award (2012)
Honoree "Anitafest" scientific meeting – Organizers: Phizicky (U. Rochester Med. School); Fields (U. Washington Coll. Med.); Schoenberg (OSU College Med.) (2014)
Winge-Lindgren Address Award - YGM (2014)
Lifetime Achievement in Science Award – RNA society (2015)
Honoree: Mentor recognition - OSU Undergraduate Mortar Board/Sphinx Honor Society (2015 & 2017)

Major Research Interests:

RNA Processing
Mechanisms of Subcellular Distribution of RNA and Proteins

Research and/or Professional Experience:

Ph.D. Thesis Research - An Investigation into the Replication of Satellite Tobacco Necrosis Virus and Tobacco Necrosis Virus RNA Genomes (9/68-9/71) - laboratory of M.E. Reichmann (deceased), Microbiology, University of Illinois, Urbana, Illinois

Postdoctoral Experience. - laboratory of Dr. B.D. Hall, Genetics, University of Washington, Seattle, WA (9/71-8/75). Control of yeast meiosis by the mating-type locus; Molecular characterization of tRNA genes of yeast

Faculty Positions:

08/75 - 07/78 **Assistant Professor**, Department of Microbiology, University of Massachusetts Medical Center, Worcester, MA
07/78 - 08/79 **Associate Professor**, Department of Microbiology, University of Massachusetts Medical Center, Worcester, MA
08/79 - 06/87 **Associate Professor**, Department of Biological Chemistry, Hershey Medical Center, The Pennsylvania State University, Hershey, PA
08/87 - 02/88 **Sabbatical Leave**, Department of Genetics, University of Washington, Seattle, WA
09/95 - 07/96 **Sabbatical Visiting Scientist**, Division of Basic Science, Fred Hutchinson Cancer Center, Seattle, WA

07/87 – 9/06 **Professor**, Department of Biochemistry and Molecular Biology, Hershey Medical Center, Pennsylvania State University, Hershey, PA
01/06 – 9/06 **Distinguished Professor**, Department of Biochemistry and Molecular Biology, The Milton S. Hershey Medical Center, Penn. State University, Hershey, PA
9/06 – 9/14 **Professor and Chair** Department of Molecular Genetics, Ohio State Univ., Columbus, OH
9/14-present **Professor** Department of Molecular Genetics, Ohio State Univ., Columbus, OH

Professional Activities:

Meeting organization:

Chair-elect (1987) and Chair (1988) - Genetics and Molecular Biology Div. American Society Microbiol.
Co-organizer – 5th Summer Symposium in Molecular Biology: "The Nucleus" at Penn. State University (1986)
Co-organizer - Cold Spring Harbor Meetings on RNA Processing (1989, 1990)
Co-organizer - Penn State University Intercollege Program in Genetics Symposium (1989)
Co-organizer - Symposia to honor Dr. Ben Hall (1992 & 2007)
Co-organizer - Keystone Symposium on Posttranscriptional Processing (1996)
Member (1998), Co-Chair (2000), Chair (2002), Emeritus Member (2004) - Yeast Genetics & Molecular Biology Meeting (YGM) Committee
Advisory board - Mechanisms of Nuclear Transport Meeting (2009)

Peer Review Committees:

Member (1998), Chair (1999-2001) - Eli Lilly Award Selection Committee (ASM)
Member: **NSF** panel **Genetic Biology** (1981-1985); **NSF** Presidential Faculty Fellows Program (1992); **NSF** IGERT Training grants - Chemical & Biological Sciences Division (1997)
Member: **NIH Genetics Study Section** (1985-1989); **NIH Molecular Biology / Cell Development and Function 1 Study Section** (1997-2002); Acting Chair (1999); Chair (2001-2002)
Member: **American Cancer Society Scientific Advisory Committee** (1994-1996); **American Cancer Society Genetic Mechanisms in Cancer** (1996-1998)
Editorial Boards: **Molecular & Cellular Biology** (1986-1990); **RNA** (1995-1997); **PLOS Genetics** (2015)
Editor: **Molecular & Cellular Biology** (1989-2000)
Faculty 1000 – member of the online review service (2001-2006)
Panel member – **HHMI** Investigator contest (2008)
Peer evaluator **NIH Pioneer** awards (2012)
Associate editor, **Yeastbook**, **Genetics Society of America** (2009-2016)
Panel member – **NIH F31/F32** grant applications (2015)
Associate Editor - **PLOS Genetics** (2016 - now)

ad hoc journal reviews activities - recent only:

Cell, Curr. Biol., eLife, EMBO J., FEBS J., Genes Dev., Genes to Cell, Genetics, J. Biol. Chem., J. Cell Biol., J. Cell Science, J. Mol. Biol., Mol. Biol. Cell, Mol Cell, Mol. Cell. Biol., Molec. Microbiol., Nature, Nature Struct. Biology, Nucl. Acids Res., PLoS Biology, PLOS Genetics, PLOS one, Proc. Natl. Acad. Sci., Science, Trends in Cell Biology, Traffic, RNA, Yeast.

Society Memberships: ASM; ASBMB; GSA (Secretary 2004-2007); AAAS; RNA Society - Board of Directors (1997-1999), President-elect/President/past-president (2002-2005).

Penn. State University Committee Activities - (partial list 1990-2006):

Biological Chemistry Faculty Search Committee, Chair (1992-1993); Member (1999-2001)
Promotion & Tenure - Biochem. & Mol. Biol. Member (1987-1997); Chair (1998-2000); Neurosci & Anat. member (1991-1995; 1997-1999); Promotion & Tenure Committee - member (College, 2000-2002)
Department Academic Standards - Past Member
Department Graduate Student Advisor (1990-1992)
Co-director, Hershey Medical Center, Macromolecular Core Facility, College (1989-1993)
Medical Student Research Committee - College, Member (1980-2004)
Neuroscience and Anatomy Chairman Search Committee – College, Past Member
Medical Student Awards Committee - College, Past Member
Committee on Cultural and Ethnic Diversity - College, Past Member
Cell & Molecular Biology Graduate Program Advisory Committee College, 1993-1995; 1998-2002)
Co-director Molecular Genetics Core Sequence Course (College, 1993-1995; 1996-2001)

Committee to Develop a Faculty Compensation Plan - College, Member (1998)
 Councilor, Faculty Organization (College, Elected Position, 2001-2002)
 Vice Dean for Research Search Committee - College, Member (2000-2001)
 Panel for the PSU Life and Health Sciences Faculty Scholar Medal (Member, University; 2003-2006)
 Course Director GEN 590 (College, 2001- 2006)
 Course Director BIOS 590 (University, 2002-2003)
 Futures Committee for Interdisciplinary Graduate Education (Co-chair, University; 2004)
 Genetics Executive Committee – University, Member
 Co-chair Penn State University Intercollege Graduate Program in Genetics (University; 2000-2006)
 Co-Director: PSU Huck Institutes Life Science BIOS Graduate Program (University; 2002-2006)

Ohio State University Committee Activities - (2006-present):

Budget Review Committee – member (University, 2007-2008)
 Chair Search Committee Microbiology, member (College, 2008)
 Chair Faculty Search Committees Molecular Genetics (Dept., 2007, 2008, and 2012)
 Center for RNA Biology - Steering committee (University, 2009-2017)
 CMBP NIH T32 training grant - Steering committee (University, 2011- 2015)
 OSU Distinguished Scholar – member selection committee (University, 2012-2015)
 Microbiology Chair Search – Chair of the committee (College, 2013)
 Sullivant Award Committee – member selection committee (University, 2015)
 Honors Undergraduate Advisor – MG (2015-now)
 OSU Provost Recruitment Committee – member of committee (University, 2016)
 OSU Presidential Fellowship Committee – member of committee (University 2017)
 OSU Interdisciplinary MCDB Graduate – member executive committee (University -2017- now)

Teaching Experience:

Member of Team Teaching Groups: Biol. Chem., Mol. Genetics, Human Genetics, Mol. Biol., Immunology, Microbiology (UMMS). Member, Organizing Committees & Lecturer in advanced graduate courses: Advanced Molecular Genetics; Cell & Molecular Biology; Genetic Analysis; Co-organizer & previous Co-director Graduate Student Core Molecular Genetics Course; Director GEN 590 (2001-2006); Co-Director BIOS 590 (2002-2006); OSU, Columbus, OH: MG605, Genetics, MG majors (2007-2012); MG2220H honors course (2012-now); MG7807-grad course, RNA biology (team teacher, 2012-now)

Graduate Students:

<u>Dates</u>	<u>Name</u>	<u>Current Position</u>
1980-1986	G. Fabian (Ph.D.)	Scientific Law, Palo Alto, CA
1981-1986	N. Atkinson (Ph.D.)	Professor, U. Texas, Austin, TX
1979-1988	S. (Nolan) Klesner (Ph.D.)	Patent Attorney Agent, Fort Collins, CO
1983-1989	S. Wang (M.S./Ph.D.)	Research Associate at Novartis, Austria
1984-1990	E. Gillman (Ph.D./M.D.)	Physician, Harrisburg, PA
1990-1991	L. Norbeck (M.S.)	Adjunct Assist. Prof. Millersville Coll., PA
1986-1993	S. Hess (Ph.D.)	No longer in science
1987-1993	K-S. Tung (Ph.D.)	Assist. Prof., National Taiwan Univ., China
1991-1995	W. Shen (Ph.D.)	Patent Attorney, DC
1990-1997	L. (Hunter) Tolerico (M.S./Ph.D.)	No longer in science
1994-1999	A. Benko (Ph.D.)	Postdoctoral Scholar PSU. Col. Med., PA
1995-2000	S. Sarkar (Ph.D.)	Assoc. Prof., Bose Institute, Kolkata, India
1997-2001	W. Feng (Ph.D.)	Sr. Scientist, Daiichi Sankyo, NJ
2001-2003	K. Butterfield-Gerson (M.S.)	Early Clinical Trial Specialist, Merck, PA
1999-2007	D. Eisaman (Ph.D./M.D.)	Physician, U. Pitt. Med. Sch., PA
2001-2005	H. Shaheen (Ph.D.)	Research Scientist, Merck, NH
2001-2006	R. Hurto (Ph.D; AHA fellow)	Research Assoc. U. Michigan, MI
2001-2006	A. Murthi (Ph.D.; AHA fellow)	MS student, Bioethics, Einstein, Bronx, NY
2001-2009	K. Stauffer (Ph.D.)	Medical writer, Wolters Kluwer Yardley, PA
2005-2006	T. Harchar (M.S.)	Medical writer, Axiom, Yardley, PA
2002-2007	M. Whitney (Ph.D.)	Assoc. Prof. Milligan College, TN
2007-2012	N. Dhungel (Ph.D., Pelotonia fellow)	Singer Instruments, UK
2007-2012	G. Diaz-Munoz (Ph.D. NIH fellowship)	Director, Science Ed. Ciencia Puerto Rico
2007-2013	H-Y Chu (Ph.D. OSU RNA fellow)	Postdoctoral, Scripps Inst., CA

2007-2013	T.-P. Lai (Ph.D., AHA fellow)	Assistant Prof., Rutgers U. NJ
2008-2014	H.-Y. Huang (Ph.D.)	NIH F32, Postdoctoral, HHMI Indiana U., IN
2010-2015	J. Wu (Ph.D., Pelotonia fellow)	Berry Fellow, Postdoctoral, Stanford U., CA
2012-2018	Y. Wan (Pelotonia Fellow)	Postdoctoral Ohio State U.

International PhD Training Program – Poland and USA

11/12-7/12, 9/13 – 12/13	D. Fortek	PhD student Polish Acad. Sci., studies in USA
7/12-9/13	A. Domanska	PhD student Polish Acad. Sci., studies in USA

Postdoctoral Scholars:

<u>Dates</u>	<u>Name</u>	<u>Current Position</u>
1978-1981	L. Schultz	Scientist Merck, Sharp & Dohme
1982-1985	D. (Hurt) Fatula (NIH fellowship)	Scientist, Skelly & Loy Analytical Labs, PA
1982-1986	R. Dunst	Scientist, Amersham Pharmaceuticals, NJ
1983-1985	M. Dihanich	No longer in science
1986-1987	D. Selvakumar	Prof. Christian Medical College Vellore, India
1986-1990	L. Slusher (NIH fellowship)	Professor, West Chester Univ., PA
1988-1990	M. Boguta	Professor, Institute of Biochem. & Biophysics, Polish Academy Science, Warsaw, Poland
1991-1994	T. Zoladek	Prof. & Head, Genetics; Institute of Biochem. & Biophysics, Polish Academy Science, Warsaw
1994-1994	P. Artz	Assoc. Prof., Dept. Chemistry, Albright College, PA
1994-2000	G. Vaduva	Research Scientist, Monsanto Co.
1997-2000	A. Azad	Postdoctoral Fellow, Oxford, UK
1990-2005	D. Stanford	Assist. Prof. Research, U. Oklahoma Coll. Med., OK
2005- 2007	H. Shaheen	Research Scientist, Merck, MA
2006-2008	A. Murthi	Medical writer, Complete Medical, NY
2009-2013	E. Kramer (NIH T32 fellowship)	Assist. Prof. Shippensburg Univ., PA
2006-2015	R. Hurto	Research Assoc., U. Michigan, Ann Arbor, MI
2014-current	K. Chatterjee (Pelotonia Fellow)	NA
2015-2016	S. Majumder	Assist. Prof. Presidency U., Kolkata, India
2017-current	R. Nostramo	NA
2017-current	S. Varia	NA

Membership of OSU Ph.D. Thesis Committees (2006-current):

Name	Committee	Completion Date
Sunghun Son	Molecular Genetics	Completed 11/07
Hui-Lin Liu	Molecular Genetics	Completed 5/09
Vidhya Ramachandran	MCDB	Completed 3/11
Komudi Singh	Molecular Genetics	Completed 11/08
I-Ming Cho	Molecular Genetics	Completed 3/11
Sarine Markossian	Molecular Genetics	Completed 5/11
Ching-Hui (Julia) Yang	Molecular Genetics	Completed 10/10
Amit Sharma	Molecular Genetics	Completed 2/12
Kuo-Fang Shen	MCDB	Completed 4/13
Meera Govindaraghavan	MCDB	Completed 4/13
Yi Xiong	Molecular Genetics	Completed 5/11
William Swinehart	OSBP	Completed 5/15
Mansi Arora	MCDB	Completed 4/14
Mid Eum Lee	MCDB	Completed 12/14
Yicheng Long	OSBP	Completed 7/15
Nitya Subrahmanian	Molecular Genetics/PCMB	Completed 8/15
Anna Belyavskaya Sherwood	Microbiology	Completed 7/14
Catey Dominguez	MCDB	Completed 1/17
Daniel Comiskey	MCDB	Completed 2/17
Brittany Theobald	MCDB	Completed MS, 2012
Katie Anderson	OSBP	Completed 3/18
Kiel Kreuzer	MCDB	Completed 2/18
Anna Grffiths	MCDB	(in progress)

Annie Kalinoski Witzky	Molecular Genetics	(in progress)
Gabriel Silveir d'Almeida	Microbiology	(In progress)
Zhonyxia Yi	Molecular Genetics	(in progress)
Shobhana Rajasenan	Molecular Genetics	(in progress)

Non-PSU/OSU Thesis Committees:

2001 – J. Kaminska, Polish Academy of Sciences, Institute of Biochemistry and Biophysics, Poland.
2001 – S. Naqvi, Institute of Molecular Agrobiolgy, Singapore.
2002 – B. Gajewska, Polish Academy of Sciences, Institute of Biochemistry and Biophysics, Poland.
2003 – M. Johansson, Dept. of Molecular Biology Umea University, Sweden.
2004 – J. Gallagher, Dept. Genetics, Yale University.
2007 – M. Boban, Ludwig Institute for Cancer Research, Stockholm, Sweden
2011 – J. Popow, Institute of Molec. Biotech., Vienna, Austria

Undergraduates/high school students (1997- now):

<u>Student</u>	<u>Present position</u>
John Raser (high school student)	Ph.D./M.D., Physician
Sieta Bonner (High school student; NSF REU fellowship)	High School Teacher, PA
Bernadatte Gray (1998, HHMI , High school student)	Physician
Katie McCoy (1997-2002; high school student)	Graduate, U. Delaware
Kim Coons (1977-1999, high school student)	High School Teacher, PA
Michael Whitney (undergraduate; Messiah College Internship, 2000)	Assist. Prof., Milligan College
Matt Angle (high school student; 2002-2004; Semifinalist Intel)	Postdoctoral Scholar, Stanford
Adam Schell (high school student; 2003-2004)	Medical Student, Emory U.
Amy Brant (high school student 2004-2006)	Graduate, Penn. St. Delaware
David Luther (MG major OSU 2007- 2008)	OSU Optometry graduate
Jessica Wagoner (MG major/ honors thesis OSU 2007-2008)	PhD Cornell U.
Jared Hale (MG major/honors thesis OSU 2007-2009)	PhD Cornell U.
Caitlin Knowlton (Summer Intern – Taylor Univ. (2009)	M.S. Bowling Green St.
Jessica Profato (MG major OSU/ honors thesis 2009-2010)	M.S., Stanford; Genetic Counselor, U. Texas, Houston
Brittany Suggs (REU student from Henderson, AR)	PhD candidate OSU
Mariya Nudel (MG Major OSU 2010-2012); Pelotonia fellow	Graduate student, Brandeis U.
Varun Rawal (Biology Major OSU Honors thesis 2013 – now)	OSU Medical Student
Sara Metcalf (MG Major OSU Honors thesis ; 2014 – 2016)	PhD candidate, Indiana U.
Heather Osborn (Visiting Scholar, Undergrad. Liberty U.; summer 2014)	Undergraduate student
Bharath Ramini (MG Major OSU Honors program; 2015-2016)	On break from UG school
Justin Weibel (Biology Major OSU; 2015-2016)	OSU BS
William Hines (Biology Major OSU Scholars program; 2015 - now)	Undergraduate student
Vijay Shah (Biology Major OSU Honors program; 2015 – now)	Undergraduate student
Alicia Bao (2015-now BMS OSU undergrad; High sch. student; 2013-15)	Pelotonia Fellow
Matt Rode (Biology Major, 2016-now)	NA
Sydney Welch (MG Major OSU)	NA

Publications:

Invited Review Articles/Chapters:

1. **Hopper, A.K.** Genetic and biochemical studies of RNA processing in yeast, p 91-132. *In RNA Processing*. ed. D. Apirion, CRC Press, Boca Raton, Florida (1984)
2. **Hopper, A.K.** Genetic methods for study of trans-acting genes involved in processing of precursors to yeast cytoplasmic transfer RNAs. *In Methods in Enzymology* **181**:400-421, ed. J.E. Dahlberg & J.N. Abelson (1990).
3. **Hopper, A.K., N.C. Martin.** Processing of yeast cytoplasmic and mitochondrial precursor tRNAs, Vol. II, pp. 99-141. *In The Molecular Biology of the Yeast *Saccharomyces*: Gene Expression*, ed. E.W. Jones, J.R. Pringle and J.R. Broach, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY (1992).
4. Martin, N.C., A.K. **Hopper**, How single genes provide tRNA processing enzymes to mitochondria, nuclei and the cytosol. *Biochimie* **76**:1161-1167 (1994).
5. **Hopper, A.K.** Nuclear functions charge ahead. *Science* **282**:2003-2004 (1998).

6. **Hopper**, A.K. Nucleus/cytosol exchange: inside out regulation. **Current Biol.** **9**: R803-806 (1999).
7. **Hopper**, A.K. Role of RanGTPase in RNA processing and export of RNA from the nucleus to the cytosol: insights from budding yeast. pp. 33-54. *In* **The Small GTPase Ran**, ed. M. Rush, Kluwer Academic Publishers, Norwell, MA (2001).
8. Engelke, D.R., A.K. **Hopper**. Modified view of tRNA: stability amid sequence diversity. **Mol. Cell** **21**:141-142 (2006).
9. Weinert, T, A.K. **Hopper**. tRNA traffic meets a cell-cycle checkpoint. **Cell** **131**: 838-839 (2007).
10. Smaldino, P., D.A. Read, M. Pratt-Hyatt, A.K. **Hopper**, D.R. Engelke. The cytoplasmic and nuclear populations of the eukaryote tRNA-isopentenyl transferase have distinct functions with implications in human cancer. **Gene** **556**:13-18 (2015).
11. Phizicky, E.M., A.K. **Hopper**. tRNA processing, modification, and subcellular dynamics: past, present, and future **RNA** **21**:483-485 (2015).
12. Wan, Y., A. K. **Hopper**. Size matters: conserved proteins function in length-dependent nuclear export of circular RNAs. **Genes and Development** **32**: 600-601 (2018).

Peer Evaluated Publications:

1. **Klein**, A.C., M.E. Reichmann. Isolation and characterization of two species of double-stranded RNA from tobacco leaves double infected with tobacco necrosis virus and satellite tobacco necrosis virus. **Virology** **42**:269-272 (1970).
2. **Hopper**, A.K., P.T. Magee, S.K. Welch, M. Friedman, B.D. Hall. Macromolecule synthesis and breakdown in relation to sporulation and meiosis in yeast. **J. Bacteriol.** **119**:619-628 (1974).
3. Magee, P.T., A.K. **Hopper**. Protein synthesis in relation to sporulation and meiosis in yeast. **J. Bacteriol.** **119**:952-960 (1974).
4. **Hopper**, A.K., B.D. Hall. Mating-type control over sporulation. I. Mutations which alter mating-type control over sporulation. **Genetics** **84**:41-59 (1975).
5. **Hopper**, A.K., B.D. Hall. Mutation of a heterothallic strain to homothallism. **Genetics** **84**:77-85 (1975).
6. **Hopper**, A.K., J. Kirsch, B.D. Hall. Mating-type and sporulation in yeast. II. Meiosis, recombination, and radiation-sensitivity in an *aa* diploid with altered sporulation control. **Genetics** **84**:61-76 (1975).
7. Andrew, C., A.K. **Hopper**, B.D. Hall. A yeast conditional mutant defective in the maturation of 27S rRNA. **Mol. Gen. Genetics** **144**:29-37 (1976).
8. Olson, M.V., D.L. Montgomery, A.K. **Hopper**, G.S. Page, F. Horodyski, B.D. Hall. Molecular characterization of the tyrosine tRNA genes of yeast. **Nature** **267**:639-641 (1977).
9. **Hopper**, A.K., F. Banks, V. Evangelides. A mutant of yeast which accumulates tRNA precursors. **Cell** **14**:211-219 (1978).
10. **Hopper**, A.K., L.D. Schultz, R.A. Shapiro. Processing of intervening sequences: A new yeast mutant which fails to excise intervening sequences from precursor tRNAs. **Cell** **19**:741-751 (1980).
11. **Hopper**, A.K., V. MacKay. Control of sporulation in yeast: *SAD1* - a mating-type specific unstable alteration that uncouples sporulation from mating-type control. **Mol. Gen. Genetics** **180**:301-314 (1980).
12. **Hopper**, A.K., J. Kurjan. tRNA synthesis: analysis of *in vivo* precursor tRNAs from wild-type and mutant yeast strains. **Nucl. Acids Res.** **9**:1019-1029 (1981).
13. **Hopper**, A.K., A. Furukawa, H.D. Pham, N.C. Martin. Defects in modification of cytoplasmic and mitochondrial transfer RNAs are caused by single nuclear mutations. **Cell** **28**:543-550 (1982).
14. Martin, N.C., A.K. **Hopper**. Isopentenylation of both cytoplasmic and mitochondrial tRNA is affected by a single nuclear mutation. **J. Biol. Chem.** **257**:10562-10565 (1982).
15. Atkinson, N.S., R.W. Dunst, A.K. **Hopper**. Characterization of an essential *Saccharomyces cerevisiae* gene related to RNA processing: cloning of *RNA1* and generation of a new allele with a novel phenotype. **Mol. Cell. Biol.** **5**:907-915 (1985).
16. Ellis, S., M. Morales, A.K. **Hopper**, N.C. Martin. Isolation and characterization of *TRM1*: a gene involved in modification of both cytoplasmic and mitochondrial tRNA. **J. Biol. Chem.** **261**:9703-9709 (1986).
17. Dihanich, M.E., D. Najarian, R. Clark, E.C. Gillman, N.C. Martin, A.K. **Hopper**. Isolation and characterization of *MOD5*: a gene required for isopentenylation of cytoplasmic and mitochondrial tRNAs of *Saccharomyces cerevisiae*. **Mol. Cell. Biol.** **7**:177-184 (1987).

18. Najarian, D., M.E. Dihanich, N.C. Martin, A.K. **Hopper**. DNA sequence and transcript mapping of *MOD5*: features of the 5' region which suggest two translational starts. **Mol. Cell. Biol.** **7**:185-191 (1987).
19. Hurt, D.J., S.S. Wang, Y-H. Lin, A.K. **Hopper**. Cloning and characterization of *LOS1*: a *Saccharomyces cerevisiae* gene involved in tRNA splicing. **Mol. Cell. Biol.** **7**:1208-1216 (1987).
20. Fabian, G.R. and A.K. **Hopper**. *RRP1*: a gene of *Saccharomyces cerevisiae* affecting ribosomal RNA processing and the production of mature ribosomal subunits. **J. Bacteriol.** **169**:1571-1578 (1987).
21. Atkinson, N.S., A.K. **Hopper**. Amplification of chromosome XIII in *RNA1* disruption strains is chromosome-specific. **Genetics** **116**:371-375 (1987).
22. Ellis, S., A.K. **Hopper**, N.C. Martin. Amino-terminal extension generated from upstream AUG codon is not required for mitochondrial import of yeast tRNA methyltransferase. **Proc. Natl. Acad. Sci.** **84**:5172-5176 (1987).
23. Wang, S.S., A.K. **Hopper**. Isolation of a yeast gene involved in species-specific pre-tRNA processing. **Mol. Cell. Biol.** **8**:5140-5149 (1988).
24. Ellis, S.R., A.K. **Hopper**, N.C. Martin. Amino terminal extension generated from an upstream AUG codon increases the efficiency of mitochondrial import of yeast N²N²-dimethylguanosine-specific tRNA methyltransferases. **Mol. Cell. Biol.** **9**:1611-1620 (1989).
25. Traglia, H.M., N.S. Atkinson, A.K. **Hopper**. Structural and functional analyses of *Saccharomyces cerevisiae* wild-type and mutant *RNA1* genes. **Mol. Cell. Biol.** **9**:2989-2999 (1989).
26. Li, J-M., A.K. **Hopper**, N.C. Martin. N²N²-dimethylguanosine-specific tRNA methyltransferase contains both nuclear and mitochondrial targeting signals in *Saccharomyces cerevisiae*. **J. Cell. Biol.** **109**:1411-1419 (1989).
27. Fabian, G.R., S.M. Hess, A.K. **Hopper**. *srd1*, a *S. cerevisiae* suppressor of the temperature-sensitive pre-rRNA processing defect of *rrp1-1*. **Genetics** **124**:497-504 (1990).
28. **Hopper**, A.K., H.M. Traglia, R.W. Dunst. The yeast *RNA1* gene product necessary for RNA processing is located in the cytosol and apparently excluded from the nucleus. **J. Cell Biol.** **111**:309-322 (1990).
29. Gillman, E.C., L.B. Slusher, N.C. Martin, A.K. **Hopper**. *MOD5* translation initiation sites determine N⁶-isopentenyladenosine modification of mitochondrial and cytoplasmic tRNA. **Mol. Cell. Biol.** **11**:2382-2390 (1991).
30. Slusher, L.B., E.C. Gillman, N.C. Martin, A.K. **Hopper**. mRNA leader length and initiation codon context determine alternative AUG selection yeast gene *MOD5*. **Proc. Natl. Acad. Sci.** **88**:9789-9793 (1991).
31. Wang, S.S., D.R. Stanford, C.D. Silvers, A.K. **Hopper**. *STP1*, a gene involved in pre-tRNA processing, encodes a nuclear protein containing zinc finger motifs. **Mol. Cell. Biol.** **12**:2633-2643 (1992).
32. Tung, K-S., L.L. Norbeck, S.L. Nolan, N.S. Atkinson, A.K. **Hopper**. *SRN1*, a yeast gene involved in RNA processing, is identical to *HEX2/REG1*, a negative regulator in glucose repression. **Mol. Cell. Biol.** **12**:2673-2680 (1992).
33. Rose, A.M., P.B.M. Joyce, A.K. **Hopper**, N.C. Martin. Separate information required for nuclear and subnuclear localization: additional complexity in localizing an enzyme shared by mitochondria and nuclei. **Mol. Cell. Biol.** **12**:5652-5658 (1992).
34. Shen, W.-C., D. Selvakumar, D.R. Stanford, A.K. **Hopper**. The *Saccharomyces cerevisiae* *LOS1* gene involved in pre-tRNA splicing encodes a nuclear protein that behaves as a component of the nuclear matrix. **J. Biol. Chem.** **268**:19436-19444 (1993).
35. Boguta, M., L.A. Hunter, W-C. Shen, E.C. Gillman, N.C. Martin, A.K. **Hopper**. Subcellular locations of *MOD5* proteins: mapping of sequences sufficient for targeting to mitochondria and demonstration that mitochondrial and nuclear isoforms comingle in the cytosol. **Mol. Cell. Biol.** **14**:2298-2306 (1994).
36. Hess, S.M., D.R. Stanford, A.K. **Hopper**. *SRD1*, a *S. cerevisiae* gene affecting pre-rRNA processing contains a C₂/C₂ zinc finger motif. **Nucl. Acids Res.** **22**:1265-1271 (1994).
37. Wolfe, C.L., Y-C. Lou, A.K. **Hopper**, N.C. Martin. Interplay of heterogenous transcription start sites and translational selection of AUGs dictate the production of mitochondrial and cytosolic/nuclear tRNA nucleotidyltransferase from the same gene in yeast. **J. Biol. Chem.** **269**:13361-13366 (1994).

38. Murawski, M., B. Szczesniak, T. Zoladek, A.K. **Hopper**, N.C. Martin and M. Boguta. *maf1* mutation alters the subcellular localization of the Mod5 protein in yeast. **Acta Bichim. Pol.** **41**:441-448 (1994).
39. Rose, A.M., H. Belford, W.-C. Shen, C. Greer, A.K. **Hopper**, N.C. Martin. Location of N²,N²-dimethylguanosine-specific tRNA methyltransferase. **Biochimie** **77**:45-53 (1995).
40. Tung, K-S., A.K. **Hopper**. The glucose repression and RAS-cAMP signal transduction pathways of *Saccharomyces cerevisiae* each affect RNA processing and the synthesis of a reporter protein. **Mol. Gen. Genetics** **247**:48-54 (1995).
41. Corbett, A.H., D.M. Koepp, G. Schlenstedt, M.S. Lee, A.K. **Hopper**, P.A. Silver. Rna1p, a Ran/TC4 GTPase activating protein, is required for nuclear import. **J. Cell Biol.** **130**: 1017-1026 (1995).
42. Zoladek, T., G. Vaduva, L.A. Hunter, M. Boguta, B.D. Go, N.C. Martin, A.K. **Hopper**. Mutations altering the mitochondrial-cytoplasmic distribution of Mod5p implicate the actin cytoskeleton and mRNA 3' ends and/or protein synthesis in mitochondrial delivery. **Mol. Cell. Biol.** **15**: 6884-6894 (1995).
43. Wolfe, C.L., A.K. **Hopper**, N.C. Martin. Mechanisms leading to and the consequences of altering the normal distribution of ATP(CTP):tRNA nucleotidyltransferase from the same gene in yeast. **J. Biol. Chem.** **271**:4679-4686 (1996).
44. Shen, W.-C., D.R. Stanford, A.K. **Hopper**. Los1p, involved in yeast pre-tRNA splicing, positively regulates members of the *SOL* gene family. **Genetics** **143**:699-712 (1996).
45. Saavedra, C., K-S. Tung, D.C. Amberg, A.K. **Hopper**, C.N. Cole. Regulation of mRNA export in response to stress in *Saccharomyces cerevisiae*. **Genes Dev.** **10**:1608-1620 (1996).
46. Traglia, H.M., J.P. O'Connor, K-S. Tung, S. Dallabrida, W.-C. Shen, A.K. **Hopper**. Nucleus-associated pools of Rna1p, the *Saccharomyces cerevisiae* Ran/TC4 GTPase activating protein involved in nucleus/cytosol transit. **Proc. Natl. Acad. Sci.** **93**:7667-7672 (1996).
47. Zoladek, T., A. Tobiasz, G. Vaduva, M. Boguta, N.C. Martin, A.K. **Hopper**. *MDP1*, a *S. cerevisiae* gene involved in mitochondrial/cytoplasmic protein distribution, is identical to the ubiquitin-protein ligase gene *RSP5*. **Genetics** **145**:595-603 (1997).
48. Vaduva, G., N.C. Martin, A.K. **Hopper**. Actin-binding verprolin is a polarity development protein required for the morphogenesis and function of the yeast actin cytoskeleton. **J. Cell Biol.** **139**:1821-1833 (1997).
49. Sarkar, S., A.K. **Hopper**. tRNA nuclear export in *S. cerevisiae*: *in situ* hybridization analysis. **Mol. Biol. Cell** **9**:3041-3055 (1998).
50. Tolerico*, L.(Hunter), A.L. Benko*, J.P. Aris, D.R. Stanford, N.C. Martin, A.K. **Hopper**. (*, equal contributors) *S. cerevisiae* Mod5p-II contains sequences for nuclear and cytosolic locations. **Genetics** **151**:57-75 (1999).
51. Feng, W-Q., A.L. Benko, J.-H. Lee, D.R. Stanford, A.K. **Hopper**. Antagonistic effects of NES and NLS motifs determine *S. cerevisiae* Rna1p subcellular distribution. **J. Cell Sci.** **112**:339-347 (1999).
52. Vaduva, G., I. Anton, N. Martinez-Quiles, N.C. Martin, R. Geha, A.K. **Hopper**, N. Ramesh The human WASP-interacting protein, WIP, activates the cell polarity pathway in yeast. **J. Biol. Chem.** **274**:17013-17018 (1999).
53. Sarkar, S., A.K. Azad, A.K. **Hopper**. Nuclear tRNA aminoacylation and its role in nuclear export of endogenous tRNAs in *S. cerevisiae*. **Proc. Natl. Acad. Sci.** **96**:14366-14371 (1999).
54. Stanford, D.R., N.C. Martin, A.K. **Hopper**. ADEPTs: information necessary for subcellular distribution of eukaryotic sorting isozymes resides in domains missing from eubacterial and archaeal counterparts. **Nucl. Acids Res.** **28**:383-392 (2000).
55. Benko, A.L., G. Vaduva, N.C. Martin, A.K. **Hopper**. Competition between a sterol biosynthetic enzyme and tRNA modification in addition to changes in the protein synthesis machinery cause altered nonsense suppression. **Proc. Natl. Acad. Sci.** **97**:61-66 (2000).
56. Qui, H., C. Hu, J. Anderson, G.R. Bork, S. Sarkar, A.K. **Hopper**, A.G. Hinnebusch. Defects in tRNA processing and nuclear export induce GCN4 translation independently of phosphorylation of the α subunit of eukaryotic translation initiation factor. **Mol. Cell. Biol.** **20**:2505-2516 (2000).
57. Williams, L.R., S.R. Ellis, A.K. **Hopper**, E.O. Davis, N.C. Martin. Splicing before import - an intein in a mitochondrially targeted preprotein folds and is catalytically active in the cytoplasm *in vivo*. **FEBS Lett.** **476**:301-305 (2000).

58. Gajewska, B., J. Kaminska, A. Jesionowska, N.C. Martin, A.K. **Hopper**, T. Zoladek. WW Domains of Rsp5p Define Different Functions. Determination of roles in fluid phase and uracil permease endocytosis in *Saccharomyces cerevisiae*. **Genetics** **157**:91-101 (2001).
59. Azad, A.K., D.R. Stanford, S. Sarkar, A.K. **Hopper**. Role of nuclear pools of aminoacyl-tRNA synthetases in tRNA nuclear export. **Mol. Biol. Cell** **12**:1381-1392 (2001).
60. Pluta, K., O. Lefebvre, N.C. Martin, W.J. Smagowicz, D.R. Stanford, S.R. Ellis, A.K. **Hopper**, A. Sentenac, M. Boguta. Maf1p a negative regulator of tRNA synthesis in *Saccharomyces cerevisiae*. **Mol. Cell. Biol.** **21**:5031-5040 (2001).
61. Feng, W., A.K. **Hopper**. A Los1p-independent pathway for nuclear export on intronless tRNAs in *S. cerevisiae*. **Proc. Nat. Acad. Sci.** **99**:5412-5417 (2002).
62. Kaminska, J., B. Gajewska, A.K. **Hopper**, T. Zoladek. Rsp5p, a new link between the actin cytoskeleton and endocytosis in yeast *S. cerevisiae*. **Mol. Cell. Biol.** **22**:6946-6958 (2002).
63. **Hopper, A.K.**, E.M. Phizicky. tRNA transfers to the limelight. **Genes Dev.** **17**:162-180 (2003). (peer-evaluated review).
64. Stanford, D.R, M.L. Whitney, R. L. Hurto, D.M. Eisaman, W.-C. Shen, A. K. **Hopper**. Yeast Sol proteins function in tRNA nuclear export and carbohydrate metabolism. **Genetics** **168**:117-127 (2004).
65. Murthi, A., A.K. **Hopper**. Genome-wide screen for inner nuclear membrane protein targeting in *Saccharomyces cerevisiae*: reveals roles for N-acetylation and an integral protein. **Genetics** **170**:1553-1560 (2005).
66. Shaheen, H.H., A.K. **Hopper**. Retrograde movement of tRNAs from the cytoplasm to the nucleus in *S. cerevisiae*, **Proc. Natl. Acad. Sci.** **102**:11290-11295 (2005) (Cover & featured article).
67. Gu, W., R.L. Hurto, A.K. **Hopper**, E.J. Grayhack, E.M. Phizicky. Depletion of yeast tRNA^{His} guanylyltransferase Thg1p leads to uncharged tRNA^{His} with additional m⁵C. **Mol. Cell Biol.** **25**:8191-8201 (2005).
68. Kwapisz, M, P. Cholbinski, A.K. **Hopper**, J.-P. Rousset, T. Zoladek. Rsp5p dependent ubiquitination modulates translation accuracy in yeast *Saccharomyces cerevisiae*. **RNA** **11**:1710-1718 (2005).
69. **Hopper, A.K.** Cellular Dynamics of small RNAs. **Critical Rev. Biochem. Mol. Biol.** **41**:3-19 (2006). (peer-evaluated review).
70. Butterfield-Gerson*, K.L., L.Z. Scheifele*, E.P. Ryan, A.K. **Hopper**, L.J. Parent. Importin- β family members mediate alpharetrovirus Gag nuclear entry via interactions with matrix and nucleocapsid. **J. Virology** **80**:1798-1806 (2006). (*, co-1st authors).
71. Hurto, R.L., A. Tong, C. Boone, A.K. **Hopper**. Inorganic phosphate deprivation causes tRNA nuclear accumulation via retrograde transport in *S. cerevisiae*. **Genetics** **176**:841-852 (2007) (GSA highlighted article and issue cover image).
72. Shaheen, H.H., R.L. Horetsky. A. Murthi, S.R. Kimball, L.S. Jefferson, A.K. **Hopper** Cytoplasmic tRNA is imported into nuclei of rat hepatoma cells in response to nutrient deprivation. **Proc. Natl. Acad. Sci.** **104**:8845-8850 (2007) (Reviewed by Faculty of 1000).
73. Whitney, M.L., R.L. Hurto, H.H. Shaheen, A.K. **Hopper**. Rapid and reversible nuclear accumulation of cytoplasmic tRNA in response to nutrient availability. **Mol. Biol. Cell** **18**:2678-2686 (2007).
74. **Hopper, A.K.** and H.H. Shaheen. A decade of surprises for tRNA nuclear/cytoplasmic dynamics. **Trends Cell Biology** **18**:98-104 (2008) (peer-evaluated review; journal featured article).
75. Lai*, T.-P., K. A. Stauffer*, A. Murthi, H.H. Shaheen, G. Peng, N.C. Martin, A.K. **Hopper**. A motif sufficient and necessary to target peripheral proteins to the yeast inner nuclear membrane. **Traffic**, **10**:1243-1256 (2009). (*, co-1st authors).
76. **Hopper, A.K.**, D.A. Pai, D.R. Engelke. Cellular dynamics of tRNAs and their genes. **FEBS Lett**: **584**:310-317 (2010). (peer-evaluated review).
77. Murthi*, A., H.H. Shaheen*, H.-Y.Huang, M.A. Preston, T.P. Lai, E.M. Phizicky, A.K. **Hopper**. Regulation of tRNA bidirectional nuclear-cytoplasmic trafficking in *S. cerevisiae*. **Mol. Biol. Cell.** **21**:639-649 (2010). (*, co-1st authors).
78. Phizicky, E.M., A.K. **Hopper**. tRNA biology charges to the front. **Genes Dev.** **24**:1832-1860 (2010). (commissioned, peer-evaluated review).
79. Hurto, R.L., A.K. **Hopper**. P-body components, Dhh1 and Pat1, are involved in tRNA nuclear-cytoplasmic dynamics. **RNA** **17**:912-924 (2011). (highlighted on issue cover)

80. Rubio, M.A.T., A.K. **Hopper**. tRNA travels from the cytoplasm to organelles. **WIREs Reviews: RNA** 2:802-817 (2011). (invited, peer-evaluated).
81. Cholbinski, P, Z. Jastrzebska, M. Wysocka-Kapcinska, D. Plochocka, A. Gornicka, **A.K. Hopper**, T. Zoladek. Yeast ubiquitin ligase Rsp5 contains nuclear localization and export signals. **Eur. J. Cell Biol.** **90**:834-843 (2011).
82. Karkusiewicz, I., D. Graczyk, T.W. Turowski, J. Towpik, N. Dhungel, A.K. **Hopper**, M. Boguta. Maf1, repressor of polymerase III RNA, is involved in tRNA processing. **J. Biol. Chem.** **286**:39478-88 (2011).
83. Dhungel, N., A.K. **Hopper**. Beyond tRNA cleavage: novel essential function for yeast tRNA splicing endonuclease unrelated to tRNA processing. **Genes Dev.** **26**:503-514 (2012).
84. Guy, M.P, B.M. Podyma, M.A. Preston, H.H. Shaheen, K.L. Krivos, P.A. Limbach, A.K. **Hopper**, E.M. Phizicky. Yeast Trm7 interacts with distinct proteins for critical modifications of the tRNA^{Phe} anticodon loop. **RNA** **18**:1921-1922 (2012).
85. **Hopper**, A.K. tRNA post-transcriptional processing, turnover, and subcellular dynamics in the yeast *Saccharomyces cerevisiae*. **Genetics** **194**:43-67 (2013) (invited, peer-evaluated).
86. Wu, J., H.-Y. Huang, A.K. **Hopper**. A rapid and sensitive nonradioactive method applicable for genome-wide analysis of *Saccharomyces cerevisiae* genes involved in small RNA biology. **Yeast** **30**:119-128 (2013).
87. Pratt-Hyatt, M. D.A. Pai, A. Haeusler, G. G. Wozniak, P.D. Good, E.L. Miller, I.X. McLeod, J.R. Yates III, A.K. **Hopper**, D.R. Engelke. Mod5 protein binds to tRNA gene complexes and affects local transcriptional silencing. **Proc. Natl. Acad. Sci.** **110**:E3081-9 (2013).
88. Chu, H.-Y., A.K. **Hopper**. Genome-wide investigation of the role of the nucleus-cytoplasm trafficking pathway in regulation of the yeast *S. cerevisiae* transcriptome and proteome. **Mol. Cell. Biol.** **33**:4242-4254 (2013) (reviewed by Faculty of 1000).
89. Kramer, E.B., A.K. **Hopper**. Retrograde tRNA nuclear import provides a new level of tRNA quality control in *Saccharomyces cerevisiae*. **Proc. Natl. Acad. Sci.** **110**:21042-21047 (2013).
90. Wu, J., A.K. **Hopper**. Healing for destruction: tRNA intron degradation in yeast is a two-step cytoplasmic process catalyzed by tRNA ligase Rlg1 and 5'-to-3' exonuclease Xrn1. **Genes Dev.** **28**:1556-1561 (2014).
91. Diaz, G, T.A. Harchar, T.-P. Lai, K.-F. Shen, A.K. **Hopper**. Requirement of the spindle pole body for targeting/tethering proteins to the inner nuclear membrane. **Nucleus** **5**:352-366 (2014).
92. Huang, H.-Y., A.K. **Hopper**. Separate responses of karyopherins to glucose and amino acid availability regulate nucleocytoplasmic transport. **Mol. Biol. Cell.** **25**:2840-2852 (2014) (images chosen for SGD homepage).
93. Huang, H.-Y., A.K. **Hopper**. *In vivo* biochemical analyses reveal distinct roles of β -importins and eEF1A in tRNA subcellular traffic. **Genes Dev.** **29**:772-783 (2015).
94. **Hopper**, A.K., H.Y. Huang. Quality control pathways for nuclear-encoded eukaryotic tRNA biosynthesis and subcellular trafficking. **Mol. Cell. Biol.** **35**:2052-2058 (2015). Peer-evaluated review.
95. Wu, J., A. Bao, K. Chatterjee, A.K. **Hopper**. Genome-wide screen uncovers novel pathways for tRNA processing and nuclear-cytoplasmic dynamics. **Genes Dev.** **29**:2633-2644 (2015).
96. Foretek, D., J. Wu, A.K. **Hopper**, M. Boguta. Control of *Saccharomyces cerevisiae* pre-tRNA processing by environmental conditions. **RNA** **22**:390349 (2016).
97. Huang H.-Y., A.K. **Hopper**. Multiple layers of stress-induced regulation in tRNA Biology. **Life**: **6**: pii: E16. (2016). Peer-evaluated review.
98. Chatterjee, K., S. Majumder, Y. Wan, V. Shah, J. Wu, H-Y Huang, A.K. **Hopper**. Sharing the load: Mex67-Mtr2 co-functions with Los1 in primary tRNA nuclear export, **Genes Dev.** **31**:2186-2198 (2017).
99. Chatterjee, K., R.T. Nostramo, Y. Wan, A.K. **Hopper**. tRNA dynamics between the nucleus, cytoplasm and mitochondrial surface: location, location, location. **BBA – Gene Regulatory Mechanisms** **1861**:373-386 (2018). Peer evaluated invited review.
100. Wan, Y., A.K. **Hopper**. From powerhouse to processing plant: conserved roles of mitochondrial outer membrane proteins in tRNA splicing. **Genes Dev.**, in revision, June 2018.

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