

Michael Ibba

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POSITIONS AND EMPLOYMENT

- 2013 - *Chair*, Department of Microbiology, Ohio State University, Columbus, Ohio
2012 - 2013 *Director*, Ohio State Biochemistry Program, Ohio State University, Columbus, Ohio
2011 - *Co-Director*, Cellular, Molecular, and Biochemical sciences training program
2010 - *Professor*, Department of Microbiology, Ohio State University, Columbus, Ohio
2006 – 2010 *Associate Professor*, Department of Microbiology, Ohio State University, Columbus, Ohio
2001 – 2006 *Assistant Professor*, Department of Microbiology, Ohio State University, Columbus, Ohio
1999 – 2001 *Associate Research Professor*, Panum Institute, University of Copenhagen, Denmark

EDUCATION AND TRAINING

- 1995 – 1998 *Associate Research Scientist*, Department of Molecular Biophysics and Biochemistry, Yale University. Adviser Professor Dieter Söll.
1993 – 1994 *Postdoctoral Research Assistant*, Microbiology Institute, Swiss Federal Institute of Technology, Switzerland. Adviser Professor Hauke Hennecke.
1990 – 1993 *Postdoctoral Research Fellow*, Department of Biotechnology, Ciba-Geigy AG, Switzerland. Adviser Dr. Martin Küenzi.
1990 *Doctor of Philosophy*, Department of Biochemistry and Applied Molecular Biology, University of Manchester, United Kingdom. Thesis: "The development of an anaerobic acetogenic continuous fermentation process". Supervisor Dr. G.H. Fynn.
1986 *Bachelor of Science*, Imperial College, University of London, London, UK. Degree: Biochemistry, B.Sc.(Hons) 2(I), ARCS.

DISTINCTIONS

- 2014 *Chair*, 2014 Gordon Research Conference on Microbial Stress Responses, Mt. Holyoke, MA
2013 *Fellow*, American Academy of Microbiology
2013 *American Society for Microbiology/NSF-LINK Travel Award*
2012 *Fellow*, American Association for the Advancement of Science
2012 *Chair*, 24th tRNA Conference. Olmué, Chile.
2010 *Honorary Professor in Gene Expression and Translation*, Faculty of Health Sciences, University of Copenhagen.
2009 *Chair*, American Society for Microbiology 109th Annual General Meeting colloquial session "Non-canonical Roles of tRNAs: Protein Biosynthesis and Beyond".
2008 *Co-Chair*, AARS 2008, Grenoble, France.
2007 *Chair*, American Society for Microbiology 107th Annual General Meeting colloquial session "Quality Control in Microbial Protein Synthesis".
2006 *Scientific Committee member and session chair*, AARS 2006, San Diego, CA.
2005 *Session co-chair and organizer*, 21st International tRNA Workshop. Bangalore, India.
2005 *Co-Chair of the organizing committee*, 40 Years of Exploring tRNA, New Haven, CT.
2005 *College of Biological Sciences Dean's Award for Classroom teaching*.

- 2003 Co-chair, *American Society for Microbiology 103rd Annual General Meeting* colloquial session "Expanding the Genetic Code".
- 2001 – 2005 Adjunct scientist, The State Serum Institute, Copenhagen, Denmark.
- 2001 – 2003 Member and contributor, Journal Club Panel, *Trends in Biochemical Sciences*.
- 2001 – 2005 Editor (with C. Francklyn and S. Cusack), "The Aminoacyl-tRNA Synthetases". Landes Bioscience. Published 2005.
- 1999 – 2001 Alfred Benzon Foundation Investigator Award. Panum Institute, University of Copenhagen, Denmark. Competitive award (twice renewed) providing full salary support.
- 1998 Member of the Scientific Committee and Session chair, EMBO Workshop on Aminoacyl-tRNA Synthetases, Mittelwihr, France.
- 1994 EMBO Fellow. Center for Protein Engineering, MRC Center, Cambridge, UK. 3 month stay in the Laboratory of Professor Sir Alan Fersht.
- 1990 Awarded a Royal Society Postdoctoral Fellowship and a European Commission Postdoctoral Fellowship (both declined).
- 1986 – 1990 Technology Transfer Fellow. Graduate student fellowship sponsored by the Water Research Council, United Kingdom.

PROFESSIONAL SERVICE

Grant reviewing

- 2011 – **Member**, National Science Foundation MCB Genetic Mechanisms Panel.
- 2010 - 2014 **Member**, National Institutes of Health Molecular Genetics A Study Section.
- 2008 – 2009 **Member**, American Heart Association Molecular Biology Peer Review Group (Region 1)
- 2007 Ad hoc reviewer, NASA Astrobiology Program.
- 2006 – 2010 Ad hoc member, NIH IDM-H, MGA, MGC and PCMB Study Sections.
- 2004 – 2010 **Member**, National Science Foundation Prokaryotic Molecular and Cellular Biology Panel.
- 2003 Ad hoc reviewer, Whitehead Fellowship Committee, New York University.
- 2003 Ad hoc reviewer, Israel Science Foundation.
- 2003 – 2004 Ad hoc reviewer, National Institutes of Health.
- 2001 Ad hoc reviewer, National Research Council, COBASE Program.
- 2001 Ad hoc reviewer, John Simon Guggenheim Memorial Foundation.
- 2000 – present Ad hoc reviewer, National Science Foundation.
- 1999 Ad hoc reviewer, Department of Energy, Division of Energy Biosciences.
- 1999 – 2003 Ad hoc reviewer, Department of the Army, Biological Sciences Division.

Editorships and service as a reviewer for journals

- 2007 – present Guest editor: *Methods, IJMS, PLoS Genetics, PNAS*.
- 2005 – Editorial boards: *Archaea* (2009 -)
Biomolecules (2014 -)
Eurekah Bioscience (2005 - 6)
FEBS Letters (2008 -)
Journal of Biological Chemistry (2009 - 2014)
Molecular and Cellular Biology (2015 -)

ADMINISTRATIVE SERVICE

Departmental

- 2012 -2013 **Promotion and Tenure Committee, Chair.**
- 2008 **Microbiology Chair Search Committee.**
- 2007 **Unit Review Committee.**
- 2005 – 2007 **Department of Microbiology Annual Symposium, founder, organizer and chair.**
- 2001 – 2011 **Graduate Studies Committee. Chair 2006-2008; 2009-2010.**
- 2002, 2009 **Faculty Search Committee.**

College and University

- 2012 - **OSU Center for RNA Biology, Steering committee member.**
- 2011 - 2012 **NMS Divisional Promotion and Tenure panel, College of Arts and Sciences**
- 2011 - **Co-Director, NIH Cellular, molecular, and biochemical sciences training program.**
- 2010 - **Program Council, Life Sciences Steering Committee**
- 2010 – 2012 **Chair, Joint OSBP/MCDB Seminar Committee**
- 2009 – 2010 **PHPID Steering committee.**
- 2008 – 2009 **Graduate School Task Force on the Life Sciences.**
- 2007 – 2009 **Council on Academic Affairs, Faculty Council member.**
- 2006 – present **OSU Institute of Mitochondrial Biology Steering Committee. Provide oversight and annual evaluation of the institute.**
- 2004 – 2008 **OSU RNA Group Steering Committee. Organization of monthly meetings and co-ordination and planning of RNA group activities.**
- 2004 – 2007 **OSBP Recruitment Committee. Planning of, and participation in, OSBP graduate student recruitment events.**
- 2004 – 2005 **BioSci Day Participant. Presented the Microbiology program to prospective students and their parents.**
- 2002 – 2009 **OSBP Seminar Committee. Select external speakers for OSBP seminar series; host seminar speakers.**
- 2001 – 2007 **College of Biological Sciences Library Committee. Discuss issues of library organization and use; provided input from departmental faculty.**
- 2001 – 2002 **OSBP Student Seminar Committee. Attended and graded weekly upper class graduate student seminar.**

Other service

- 2013 - *American Society for Microbiology* Committee on Graduate and Postdoctoral Education
- 2013 Chair, *RNA Society* Nominating Committee
- 2010 Scientific Advisory Board, CNRS, Strasbourg, France.
- 2009 Co-PI, NSF IGERT proposal.
- 2008 External Review Committee, CNRS, Palaiseau, France.
- 2005 Hayes Graduate Research Forum, Judge.
- 2004 – present Faculty trainer, Chemistry-Biology Interface NIH T32 training grant.
- 2004 – 2005 OSU Honors Day and National Merit Scholar Lunches, Faculty participant.
- 2004 – 2005 Denman Undergraduate Research Forum, Judge.
- 2004 – 2005 University Scholar Maximus Competition, Essay Evaluator.
- 2002 – present Graduate School Representative on graduate exams (1-2 exams/year).
- 2002 – 2004 Department of Microbiology representative for graduate student testing in the OSU Spoken English Program (2 exams/year).
- 2001 – present Member, Ohio State Biochemistry Program.

PRESENTATIONS (since joining OSU in 2001)

Invited presentations at scientific meetings

- 2014 35th Chilean Congress of Microbiology, La Serena, Chile (speaker)
- 2014 25th tRNA Conference, Greece (speaker and session chair)
- 2014 ASM Kadner Institute, San Jose, CA (speaker and facilitator)
- 2014 ASM Conference on Undergraduate Education, Danvers, MA (speaker)
- 2014 Sigma-Aldrich Symposium on RNA Science, Albany, NY (keynote lecturer)
- 2013 Barcelona BioMed Conference on Gene Translation: fidelity and Quality Control, Spain (speaker)
- 2013 Annual Biomedical Research Conference for Minority Students, Nashville, TN (speaker)
- 2012 Gordon Research Conference on Microbial Stress Responses, Mt. Holyoke, MA (speaker)
- 2012 Cold Spring Harbor Advanced Bacterial Genetics Course (speaker)
- 2012 Annual Meeting of the RNA Society, Ann Arbor, MI (speaker)
- 2012 Society for General Microbiology Spring Conference, Dublin, Ireland (speaker)
- 2011 AARS 2011, Snowbird, UT (speaker)
- 2011 Cold Spring Harbor Advanced Bacterial Genetics Course (speaker)
- 2011 111th American Society for Microbiology General Meeting, New Orleans, LA (speaker)
- 2010 Molecular Genetics of Bacteria and Phages, CSHL, Cold Spring Harbor, NY (speaker)
- 2010 Annual Meeting of the RNA Society, Seattle, WA (plenary lecturer)
- 2010 23rd International tRNA Workshop, Aveiro, Portugal (plenary lecturer, session chair)
- 2009 31st Chilean Congress of Microbiology, Santa Cruz, Chile (plenary lecturer)
- 2009 Molecular Genetics of Bacteria and Phages, Madison, WI (speaker, session chair)
- 2009 Conference on Gram Positive Microorganisms, San Diego, CA (speaker, session chair)
- 2009 109th American Society for Microbiology General Meeting, Philadelphia, PA (speaker, session chair)
- 2009 Ohio Branch ASM, Annual Meeting, Denison University, OH (speaker)
- 2008 AARS 2008, Veyrier du Lac, France (meeting co-chair)
- 2008 Gordon Research Conference on Microbial Stress Responses, Mt. Holyoke, MA (speaker)
- 2007 22nd International tRNA Workshop, Uppsala, Sweden (speaker, session chair)
- 2007 Molecular Genetics of Bacteria and Phages, Madison, WI (speaker)
- 2007 107th American Society for Microbiology General Meeting, Toronto (speaker, session chair)
- 2006 AARS 2006, San Diego, CA (speaker, session chair)
- 2005 21st International tRNA Workshop, Bangalore, India, (speaker, session chair)
- 2005 40 Years of Exploring tRNA, New Haven, CT (speaker, session chair)
- 2005 XIX Annual Meeting of the Croatian Chemical Society, Opatija, Croatia (plenary lecturer)
- 2004 International Conference on Aminoacyl-tRNA Synthetases, Seoul, Korea (speaker)
- 2003 20th International tRNA Workshop, Banz, Germany (speaker)
- 2003 Ohio Branch ASM, Annual Meeting, Mason, OH (speaker)
- 2003 103rd American Society for Microbiology General Meeting, Washington, D.C. (session co-chair)
- 2002 Asilomar Conference on Aminoacyl-tRNA Synthetases, Asilomar, CA (speaker)
- 2001 Rustbelt RNA Meeting, Deer Creek, OH (speaker)
- 2001 9th International Conference on Microbial Genomics, Gatlinburg, TN (speaker)

External invited seminars

- 2014 Department of Molecular, Cellular & Developmental Biology, U. California, Santa Barbara, CA
- 2014 Department of Biochemistry and Biophysics, Texas A&M University, College Station, TX
- 2014 Department of Microbiology, University of Pennsylvania, Philadelphia, PA
- 2014 Department of Biochemistry and Molecular Biology, Saint Louis University, St. Louis, MO
- 2013 Department of Molecular Biophysics and Biochemistry, Yale University, New Haven, CT
- 2013 RNA Center, Case Western Reserve University, Cleveland, OH
- 2013 Department of Chemistry, Wayne State University, Detroit, MI
- 2013 Department of Biochemistry, School of Medicine, University of Patras, Greece
- 2013 Department of Molecular and Human Genetics, Baylor College of Medicine, TX
- 2012 Department of Microbiology and Immunology, Thomas Jefferson University, PA
- 2012 Department of Biochemistry & Biophysics, University of Rochester, NY
- 2012 Department of Biochemistry, IUPUI, Indianapolis, IN
- 2011 Department of Bacteriology, University of Wisconsin, Madison, WI
- 2011 Department of Biochemistry and Molecular Genetics, University of Illinois-Chicago, IL
- 2011 Department of Biology, University of California, Merced, CA
- 2011 Department of Molecular Genetics and Microbiology, University of Texas, Austin, TX
- 2011 Faculty of Health Sciences, University of Copenhagen, Denmark
- 2010 IBMC du CNRS, Strasbourg, France
- 2010 Departments of Biochemistry and Microbiology, Emory University, Atlanta, GA
- 2010 Department of Molecular Genetics, University of Toronto, Canada
- 2010 Department of Biochemistry and Molecular Biology, LSU HSC, Shreveport, LA
- 2009 Faculty of Medicine, University of Chile, Santiago, Chile
- 2009 Department of Biological Sciences, Ohio University, Athens, OH
- 2009 Department of Microbiology and Cell Science, University of Florida, Gainesville, FL
- 2009 Department of Biochemistry, University of Vermont, Burlington, VT
- 2009 Department of Biochemistry, University of Illinois at Urbana Champaign, IL
- 2009 Department of Microbiology and Molecular Genetics, UMDNJ, Newark, NJ
- 2009 Structure and Chemistry Affinity Group Seminar, Scripps Research, La Jolla, CA
- 2009 Department of Biochemistry and Molecular Biophysics, Washington University, St. Louis, MO
- 2008 IBMC du CNRS, Strasbourg, France
- 2008 Department of Biophysics and Biophysical Chemistry, Johns Hopkins School of Medicine, Baltimore, MD
- 2008 Department of Biochemistry, University of Miami School of Medicine, Miami, FL
- 2008 Department of Microbiology and Molecular Genetics, Michigan State University, MI
- 2007 Chinese Academy of Sciences, Shanghai, China
- 2007 Department of Molecular, Cellular & Developmental Biology, U. California, Santa Barbara, CA
- 2007 Genetics Seminar Series, University of California, Los Angeles, CA
- 2005 CARB, University of Maryland, Bethesda, MD
- 2005 Microbiology Institute, ETH Zürich, Zürich, Switzerland
- 2004 Department of Molecular Biophysics and Biochemistry, Yale University, New Haven, CT
- 2004 Department of Microbiology, University of Georgia, Athens, GA
- 2004 Department of Biological Sciences, St. John's University, New York, NY

2003 Department of Microbiology, Miami University, Oxford, OH
2003 Department of Chemistry and Biochemistry, Colorado University, Boulder, CO
2003 Department of Biology, Indiana University, Bloomington, IN
2002 Department of Chemistry, University of Toledo, Toledo, OH
2002 Department of Chemistry, University of Buffalo, Buffalo, NY
2002 Department of Biochemistry and Microbiology, University of Laval, Canada
2001 Department of Genetics, Trinity College, Dublin, Ireland

STUDENTS AND TRAINEES

Doctoral Students (dissertation advisor)

Current

Sara Elgamal	2011 – present	Department of Microbiology
Adil Moghal	2012 – present	Ohio State Biochemistry Program
Kyle Mohler	2013 – present	Department of Microbiology
Andrei Rajkovic	2012 – present	MCDB Program
Rachel Simari	2013 – present	Ohio State Biochemistry Program
Sarah Tyler	2014 – present	Department of Chemistry

Completed

Sandro Ataide	2002 – 2006	Assistant Professor, University of Sydney
Jeffrey Levensgood	2002 – 2006	Research Scientist, Case Western Reserve
Corinne Hausmann	2004 – 2008	Deloitte Consulting
Jiqiang Ling	2004 – 2008	Assistant Professor, University of Texas
Medha Raina	2009 – 2014	Post-Doc, NIH
Noah Reynolds	2006 – 2011	Post-doc, Yale University
Theresa Rogers	2006 – 2010	Assistant Professor, Cal. Lutheran University
Samhita Yadavalli	2007 – 2012	Post-doc, University of Pennsylvania
Kiley Dare	2007 – 2012	ProFile Discovery

Masters Students (thesis advisor)

Amanda Monthan (Lund University, Sweden), 2000		Scientist, Swedish Dairy Association
Marla Gilreath	2009 – 2011	Regulatory Specialist, Nexeo Solutions
Mengchi Wang	2011 – 2013	Graduate student, UC San Diego

Post-doctoral Fellows

Nina Mejlhede	2000 – 2001	Scientist, State Serum Institute, Denmark
Mette Prætorius	2001 – 2005	Lecturer, Ohio State University
Hervé Roy	2003 – 2011	Assistant Professor, Univ of Central Florida
Shiming Wang	2004 – 2006	Assistant Professor, Nanjing University
Rajat Banerjee	2008 – 2010	Assistant Professor, University of Calcutta
Assaf Katz	2011 – 2014	Assistant Professor, University of Chile
Tammy Bullwinkle	2010 – present	
Jennifer Shepherd	2011 – present	

Doctoral Students (dissertation committee member)

12 Ph.D. current; 7 Ph.D. and 3 M.Sc., completed

Senior Honors Theses

Completed

Irnov	(2003–2004; post-doc at Yale University)
Roocha Patel	(2004-2005; MD student at Ohio State University)
Molly Paras	(2004-2006; MD student at the Mayo Clinic)
Caitlin Baiduc	(2008-2009; graduate student at the University of Pennsylvania)
Sara Repasky	(2008-2010)
Bailey Dyer	(2008-2010)
Kayla Humenansky	(2009-2010);
Lindsey Solden	(2011-2013; graduate student at Ohio State University)
Eleftheria Matsa	(2011-2013);

TEACHING

Molecular Basis for Microbial Biodiversity (Micro 720, 4 credit hours), Ohio State University, 2001, lecturer (taught 5% of the class), graduate level.

Special Topics in Biochemistry (Biochem 795, 3 credit hours), Ohio State University, 2002 - 2003, supervisor of seminar course (30%), graduate level.

Seminar in Advanced Biochemistry (Biochem 796, 1 credit hour), Ohio State University, 2002, supervisor of seminar course (25%), graduate level.

General Microbiology 2 (Micro 521, 5 credit hours), Ohio State University, 2003 - 2012, lecturer (100%), undergraduate level.

Seminar in Microbiology (Micro 880, 1-2 credit hours), Ohio State University, 2003 - 2007, supervisor of seminar course (50%), graduate level.

The RNA World (Micro 8050, 3 credit hours), Ohio State University, 2004 - present, lecturer (20%), graduate level.

Current Topics in Molecular Microbiology (Micro 7060, 2 credit hours), Ohio State University, 2006 - present, lecturer (25%), graduate level.

Principles of Microbiology (Micro 6010, 2 credit hours), Ohio State University, 2012 - present, lecturer (100%), graduate level.

EXTRAMURAL FUNDING

Completed

- 2000 Danish Natural Science Research Foundation / Novo Nordisk Foundation. Grant. "Development of *in vivo* strategies for site-directed incorporation of non-natural amino acids". P.I.
- 2000 Danish Natural Science Research Foundation. Grant. "Automated chromatographic systems for the purification of proteins and nucleic acids". P.I.
- 2000 Fifth Framework program of the European Commission. Grant QLG2-1999-00660. "A functional genomics study of lysyl-tRNA synthesis as a target for the diagnosis and treatment of microbial infections and mitochondrial myopathies". P.I. (Co-P.I.s, K. Devine, C. Florentz; C. Marsac, M. Schneider).
- 2002 **American Heart Association Grant 0265004B**. "*Borrelia burgdorferi* lysyl-tRNA synthetase: a therapeutic target for Lyme disease". (07/2002 – 06 / 2004). P.I.
- 2003 National Institutes of Health. "Supplement to GM65183". Supplemental award for purchase of a microvolume stopped-flow reaction analyzer.
- 2004 **National Science Foundation Grant MCB-0344002**. "The role of aminoacyl-tRNA synthesis in translational quality control". P.I. (Co-P.I., A. Wolfson).
- 2005 American Heart Association Pre-doctoral fellowship 0515086B for Sandro Ataide. "Utilization of non-canonical tRNA by lysyl-tRNA synthetases".
- 2006 **US-Israel Binational Science Foundation**. "Structural and functional investigation of cytosolic and mitochondrial phenylalanyl-tRNA synthetase". Co-P.I. (P.I., M. Safro). (09/2006 – 08/2010).
- 2007 American Heart Association Pre-doctoral fellowship 0715172B for J. Ling. "Pathogenic mechanism and functional rescue of a tRNA^{Phe} mutation causing MERFF". (07/2007 – 06/2009)

- 2008 **National Science Foundation Grant MCB-0744791**. "The role of quality control in microbial translation". P.I. (Joint P.I.s, B. Lazazzera, A. Wolfson). (03/2008 – 02/2011).
- 2008 **National Science Foundation Grant MCB-0936068**. "Collaborative research: The role of quality control in microbial translation". P.I. (01/2008 – 03/2012).
- 2010 **National Science Foundation Grant CHE-1040302**. "MRI: Acquisition of a high-resolution time-of-flight mass spectrometer". Co PI (Green-Church). (10/10 - 09/13)
- 2011 **Amgen Inc. contract #2011566548**. "Error rates in mammalian protein synthesis". P.I. (11/11 – 11/12).
- 2011 **National Science Foundation Grant MCB-1052344**. "Collaborative research: The role of quality control in microbial translation". P.I. (04/2011 – 09/2014).
- 2014 **National Institutes of Health Grant 1R13 AI111919**. "2014 Microbial Stress Response GRC/GRS". P.I. (Joint P.I., C. White-Ziegler). (05/2014 – 10/2014).

Current

- 2003 **National Institutes of Health Grant 2R01 GM065183**. "Biochemistry of lysyl-tRNA synthetases". P.I. (01/2003 - 12/2015).
- 2011 **National Institutes of Health Grant 1T32 GM086252**. "Cellular, molecular, and biochemical sciences training grant". P.I. (Joint P.I., K. Musier Forsyth). (07/2011 – 06/2016).
- 2014 **National Science Foundation Grant MCB- 1412611**. "Collaborative research: The role of quality control in microbial translation". P.I. (09/2014 – 08/2017).

PUBLICATIONS

153. Farah, C., Levicán, G., **Ibba, M.** and Orellana, O. (2014) Effect of hydrogen peroxide on the biosynthesis of heme and proteins: potential implications for the partitioning of Glu-tRNA^{Glu} between these pathways. *Int. J. Mol. Sci.* **15**, 23011-23023.
152. Kobayashi, K., Katz, A., Rajkovic, A., Ishii, R., Branson, O.E., Freitas, M.A., Ishitani, R., **Ibba, M.** and Nureki, O. (2014) The non-canonical hydroxylase structure of YfcM reveals a metal ion-coordination motif required for EF-P hydroxylation. *Nucleic Acids Res.* **42**, 12295-12305
151. Moghal, A., Mohler, K. and **Ibba, M.** (2014) Mistranslation of the genetic code. *FEBS Letts.* **588**, 4305-4310.
150. Hersch, S.J., Elgamal, S., Katz, A., **Ibba, M.** and Navarre, W.W. (2014) Translation initiation rate determines the impact of ribosome stalling on bacterial protein synthesis. *J. Biol. Chem.* **289**, 28160-28171.
149. Shepherd, J. and **Ibba, M.** (2014) Relaxed substrate specificity leads to extensive tRNA mischarging by *Streptococcus pneumoniae* class I and class II aminoacyl-tRNA synthetases. *mBio* **5** e01656-14.
148. Elgamal, S., Katz, A., Hersch, S.J., Newsom, D. White, P., Navarre, W.W. and **Ibba, M.** (2014) EF-P dependent pauses integrate proximal and distal signals during translation. *PLoS Genetics.* **10** e1004553.
147. Bullwinkle, T.J., Lazazzera, B. and **Ibba, M.** (2014) Quality control and infiltration of translation by amino acids outside of the genetic code. *Annu. Rev. Genet.* **48**, 149-166.
146. Bullwinkle, T. J., Reynolds, N. M., Raina, M. Moghal, A. Matsa, E., Rajkovic, A., Kayadibi, H., Fazlollahi, F., Ryan, C., Howitz, N., Faull, K., Lazazzera, B. A. and **Ibba, M.** (2014) Oxidation of cellular amino acid pools leads to cytotoxic mistranslation of the genetic code. *eLife* e02501.
145. Raina, M. and **Ibba, M.** (2014) tRNAs as regulators of biological processes. *Front. Genet.* **5**, 1-14.

144. Raina, M., Moghal, A., Kano, A., Jerums, M., Schnier, P.D., Luo, S., Deshpande, R., Bondarenko, P.V., Lin, H. and **Ibba, M.** (2014) Reduced amino acid specificity of mammalian tyrosyl-tRNA synthetase is associated with elevated mistranslation of Tyr codons. *J. Biol. Chem.* **289**, 17780-17790.
143. Dare, K., Shepherd, J., Roy, H., Seveau, S. and **Ibba, M.** (2014) LysPGS formation in *Listeria monocytogenes* has broad roles in maintaining membrane integrity beyond antimicrobial peptide resistance. *Virulence* **5**, 534-546.
142. Fredrick, K. and **Ibba, M.** (2014) The ABCs of the ribosome. *Nat. Struct. Mol. Biol.* **2**, 115-116.
141. Katz, A., Solden, L., Zou, S.B., Navarre, W.W. and **Ibba, M.** (2014) Molecular evolution of protein-RNA mimicry as a mechanism for translational control. *Nucleic Acids Res.* **42**, 3261-3271.
140. Bullwinkle, T.J. and **Ibba, M.** (2014) Emergence and Evolution. *Top. Curr. Chem.* **344**, 43-87.
139. Shepherd, J. and **Ibba, M.** (2013) Lipid II-independent trans editing of mischarged tRNAs by the penicillin resistance factor MurM. *J. Biol. Chem.* **288**, 25915-25923.
138. Shepherd, J. and **Ibba, M.** (2013) Direction of aminoacylated transfer RNAs into antibiotic synthesis and peptidoglycan-mediated antibiotic resistance. *FEBS Letts.* **587**, 2895-2904.
137. **Ibba, M.** (2013) Genetic Code. *Brenner's Encyclopedia of Genetics, Second Edition (Hughes and Malloy eds.)*. Academic Press. 234-235.
136. Hersch, S.J., Wang, M., Zou, S.B., Rajkovic, A., Moon, K.-M., Foster, L.J., **Ibba, M.*** and Navarre, W.W. (2013) Divergent protein motifs direct EF-P mediated translational regulation in *Salmonella* and *Escherichia coli*. *mBio* **4**, e00180-13.(*co-corresponding author).
135. Bullwinkle, T.J., Zou, S.B., Rajkovic, A., Hersch, S.J., Elgamal, S., Robinson, N., Smil, D., Bolshan, Y., Navarre, W.W. and **Ibba, M.** (2013) (R)- β -lysine modified elongation factor P functions in translation elongation. *J. Biol. Chem* **288**, 4416-4423.
134. Yadavalli, S.S. and **Ibba, M.** (2013) Selection of tRNA charging quality control mechanisms that increase mistranslation of the genetic code. *Nucleic Acids Res.* **41**, 1104-1112.
133. Navarre, W.W. and **Ibba, M.** (2012) Elongation factor P: a role in posttranscriptional control of gene expression. *Microbe* **7**, 449-454.
132. Raina, M. and **Ibba, M.** (2012) Taking AIM at the start of translation. *J. Mol. Biol.* **423**, 473-474.
131. Elo, J.M., Yadavalli, S.S., Euro, L., Isohanni, P., Götz, A., Carroll, C., Valanne, L., Alkuraya, F.S., Uusimaa, J., Paetau, A., Caruso, E.M., Pihko, H., **Ibba, M.**, Tyynismaa, H. and Suomalainen, A. (2012) Mitochondrial phenylalanyl-tRNA synthetase mutations underlie fatal infantile Alpers encephalopathy. *Hum. Mol. Genet.* **21**, 4521-4529.
130. Rogers, T.E., Ataide, S.F., Dare, K., Katz, A. Seveau, S., Roy, H. and **Ibba, M.** (2012) A pseudo-tRNA modulates antibiotic resistance in *Bacillus cereus*. *PLoS ONE.* **7**, e41248.
129. Raina, M., Elgamal, S., Santangelo, T. and **Ibba, M.** (2012) Association of a multi-synthetase complex with translating ribosomes in the archaeon *Thermococcus kodakarensis*. *FEBS Letters.* **586**, 2232-2238.
128. Greber, B.J., Boehringer, D, Godinic-Mikulcic, V., Crnkovic, A., **Ibba, M.**, Weygand-Durasevic, I. and Ban, N. (2012) Cryo-EM Structure of the Archaeal 50S Ribosomal Subunit in Complex with Initiation Factor 6 and Implications for Ribosome Evolution. *J. Mol. Biol.* **418**, 145-160.
127. Dare, K. and **Ibba, M.** (2012) Roles of tRNA in cell wall biosynthesis. *Wiley Interdiscip. Rev. RNA.* **3** 247-264
126. Yadavalli, S.S. and **Ibba, M.** (2012) Quality control in aminoacyl-tRNA synthesis: its role in translational fidelity. *Adv. Protein Chem. Struct. Biol.* **86**, 1-43.
125. Zou, S.B., Hersch, S., Roy, H., Wiggers, J.B., Leung, A., Buranyi, S., Xie, J.L., Dare, K., **Ibba, M.** and Navarre, W.W. (2012) Loss of Elongation factor P Disrupts Bacterial Outer-membrane Integrity. *J. Bacteriol.* **194**, 413-425.

124. Gilreath, M.S., Roy, H., Bullwinkle, T.J., Katz, A., Navarre, W.W. and **Ibba M** (2011) Beta-lysine discrimination by lysyl-tRNA synthetase. *FEBS Letters*. **585**, 3284-3288.
123. Roy, H., Zou, S.B., Bullwinkle, T.J., Wolfe, B.S., Gilreath, M.S., Forsyth, C.J., Navarre, W.W. and **Ibba, M.** (2011) The tRNA synthetase paralog PoxA modifies elongation factor-P with (R)- β -lysine. *Nature Chem. Biol.* **7**, 667-669.
122. Banerjee, R., Reynolds, N.M., Yadavalli, S.S., Rice, C., Roy, H., Banerjee, P., Alexander, R.W. and **Ibba, M.** (2011) Mitochondrial aminoacyl-tRNA synthetase single nucleotide polymorphisms that lead to defects in refolding but not aminoacylation. *J. Mol. Biol.* **410**, 280-293.
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