

Michael Ibba

Department of Microbiology, Ohio State University,
484 West 12th Avenue, Columbus, Ohio 43210-1292
Phone: 614-292-2120; Fax: 614-292-8120; e-mail: ibba.1@osu.edu
<http://microbiology.osu.edu/people/ibba.1>

POSITIONS AND EMPLOYMENT

- 2013 - present *Chair*, Department of Microbiology, Ohio State University, Columbus, Ohio
2012 - 2013 *Director*, Biochemistry Graduate Program, Ohio State University, Columbus, Ohio
2011 - present *Co-Director*, NIH Cellular, Molecular, and Biochemical sciences training program
2010 - present *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

- 2015 *American Society for Microbiology Distinguished Lecturer*
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 – Ad hoc member, NIH IDM-H, MIRA, 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: *eLife, IJMS, Methods, PLoS Genetics, PNAS*.
- 2005 – Editorial board member: *Archaea* (2009 -)
Biomolecules (2014 -)
Eurekah Bioscience (2005 - 2006)
FEBS Letters (2008 -)
IJMS (2015 - 2016)
Journal of Biological Chemistry (2009 – 2014; 2017-2022)
Molecular and Cellular Biology (2015 -)

ADMINISTRATIVE SERVICE

Departmental

- 2013 - present **Chair, Department of Microbiology.** Notable accomplishments to date include:
- Recruitment from Arizona of two established “rising stars” in microbial genomics and environmental microbiology.
 - Development of a strategic plan that secured funding from the Provost’s office for two new additional faculty lines in microbial systems biology.
 - Extensive overhaul of the Department’s staff structure including revision of position descriptions and supervisory hierarchy.
 - Successful retention of a member of the National Academy of Sciences.
 - Secured funding from the College of Arts and Sciences to support expanded undergraduate course offerings in immunology and environmental microbiology.
- 2012 – 2013 **Chair,** Promotion and Tenure Committee.
- 2006 – 2010 **Chair,** Microbiology Graduate Studies Committee. This included a complete overhaul of the Microbiology Graduate Program.
- 2005 – 2007 **Founder, Organizer and Chair.** Department of Microbiology Annual Symposium.
- 2008 Microbiology Chair Search Committee.
- 2007 Unit Review Committee.
- 2002, 2009 Faculty Search Committee.

College and University

- 2016 - present **Advocate and Facilitator,** *Ohio State Advocate FORWARD Program* for gender equity
- 2015 - 2016 **Facilitator,** *Searching for Excellence* diversity workshops, Office of Diversity and Inclusion.
- 2015 - 2016 **Co-Director,** *Business Fundamentals for Science* Executive Education Program.
- 2012 - 2013 **Director,** Biochemistry Graduate Program, Ohio State University, Columbus, Ohio
- 2011 - present **Co-Director and PI,** NIH Cellular, Molecular, and Biochemical Sciences training program. I am one of two founding PIs for this NIGMS-funded T32, which was awarded in 2011.
- 2010 – 2012 **Chair,** Joint OSBP/MCDB Seminar Committee
- 2011 - 2012 NMS Divisional Promotion and Tenure panel, College of Arts and Sciences
- 2010 - 2015 Program Council, Life Sciences Steering Committee
- 2009 – 2010 Public Health Preparedness for Infectious Diseases 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.
- 2004 – present OSU Center for RNA Biology, Steering committee member.
- 2004 – 2007 OSBP Recruitment Committee.
- 2004 – 2005 BioSci Day Participant. Presented the Microbiology program to prospective students.
- 2002 – 2009 OSBP Seminar Committee. Select and host external speakers for seminar series.
- 2001 – 2002 OSBP Student Seminar Committee. Instructor for upper class graduate student seminar.

Other service

- 2013 - present *American Society for Microbiology* Committee on Graduate and Postdoctoral Education. Instructor for webinar and in person workshops on grant writing.
- 2013 **Chair,** *RNA Society* Nominating Committee.
- 2010 - present Scientific Advisory Board, CNRS, Strasbourg, France.
- 2008 External Review Committee, CNRS, Palaiseau, France.
- 2004 – present Faculty trainer, Chemistry-Biology Interface NIH T32 training grant.
- 2004 – 2005 OSU Honors Day and National Merit Scholar Lunches, Faculty participant.

PRESENTATIONS (since joining OSU in 2001)

Invited presentations at scientific meetings

- 2017 Gordon Research Conference on Translation in Health & Disease, Galveston, TX (speaker, invited)
- 2016 Virginia Branch ASM meeting, Roanoke, VA (keynote speaker)
- 2016 North Central Branch ASM meeting in Ames, IA (keynote speaker)
- 2016 tRNA 2016, South Korea (speaker)
- 2016 Gordon Research Conference on Microbial Stress Responses, Mt. Holyoke, MA (speaker)
- 2015 AARS 2015, Barcelona, Spain (speaker and session chair)
- 2015 2nd Midlands Molecular Microbiology Meeting, Nottingham, UK (Keynote speaker)
- 2015 ASM Kadner Institute, Washington, DC (speaker and facilitator)
- 2015 Gordon Research Conference on Translation Machinery in Health & Disease, Ventura, CA (speaker)
- 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

- 2016 Faculty of Sciences, University of Chile, Santiago, Chile
- 2016 IBMC du CNRS, Strasbourg, France
- 2016 National Institutes of Health, Bethesda, MD
- 2016 Department of Cell Biology and Molecular Genetics, University of Maryland, College Park, MD
- 2016 Department of Biology, University of Copenhagen, Denmark
- 2016 Ribocore, University of Uppsala, Sweden
- 2016 Department of Biology, Indiana University, Bloomington, IN
- 2015 Department of Microbiology, University of Washington, Seattle, WA
- 2015 Department of Chemistry, Portland State University, Portland, OR
- 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

Kyle Mohler	2013 – present	Department of Microbiology
Annie Witzky	2015 – present	Department of Molecular Genetics
Paul Kelly	2015 – present	MCDB Program
Rebecca Mann	2016 – present	Ohio State Biochemistry Program
Rodney Tollerson	2016 – present	Department of Microbiology

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
Theresa Rogers	2006 – 2010	Assistant Professor, Cal. Lutheran University
Noah Reynolds	2006 – 2011	Post-doc, Yale University
Samhita Yadavalli	2007 – 2012	Post-doc, University of Pennsylvania
Kiley Dare	2007 – 2012	ProFile Discovery
Medha Raina	2009 – 2014	Post-Doc, NIH
Sara Elgamal	2011 – 2015	Post-Doc, Ohio State University
Adil Moghal	2012 – 2016	Graduate Student, Moritz College of Law
Andrei Rajkovic	2012 – 2016	Post-Doc, Uppsala University, Sweden

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
Rachel Simari	2013 – 2014	Clinical microbiologist, Utah
Sarah Tyler	2014 – 2015	Graduate student, Boston College

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
Jennifer Shepherd	2011 – 2015	Editor, Nature Publishing Group
Tammy Bullwinkle	2010 – 2016	Assistant Professor, Ohio State University
Miguel-Angel Gomez Rubio	2017 -	

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; MD student at Ohio State University)

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 - 12/2017).
- 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 – 06/2021).
- 2014 **National Science Foundation Grant MCB- 1412611**. “Collaborative Research: The Role of Quality Control in Microbial Translation”. P.I. (09/2014 – 08/2017).
- 2015 **Army Research Office Grant 66973-LS**. “Increased Translation Error Rates and Long-term Survival”. Co-P.I. (05/2015 – 04/2018).
- 2016 **National Institutes of Health Grant R21/R33 AI127582**. “A Systems Biology Approach for Targeted Drug Discovery for Leishmaniasis”. P.I. (12/2016 – 12/2021).

Pending

- 2016 **National Institutes of Health Grant R35**. “Causes and Population-genetic Consequences of Molecular Variation”. Sub-contract (M. Lynch, P.I.).
- 2016 **National Institutes of Health Grant 2R01 GM065183-14A1**. “Mechanisms of translational control”. P.I. (03/2018 - 02/2022).
- 2017 **National Science Foundation Grant MCB- 1715840**. “Collaborative Research: The Role of Quality Control in Microbial Translation”. P.I. (09/2017 – 08/2020).

PUBLICATIONS (H-INDEX 46)

170. Mohler, K., Mann, R., Bullwinkle, T., Hopkins, K., Hwang, L., Reynolds, N., Gassaway, B., Aerni, H., Rinehart, J., Polymenis, M., Faull, K., and **Ibba, M.** (2017) Editing of misaminoacylated tRNA controls the sensitivity of amino acid stress responses in *Saccharomyces cerevisiae*. *Nucl. Acids Res.*, In Press.
169. Mohler, K., Aerni, H.R., Gassaway, B., Ling, J., **Ibba, M.** and Rinehart, J. (2017) MS-READ: Quantitative measurement of amino acid incorporation. *BBA - Gen Subjects*. In Press.
168. Kermgrad, E., Yang, Z., Michel, A.-M., Simari, R., Wong, J., **Ibba, M.** and Lazazzera, B.A. (2017) Quality control by isoleucyl-tRNA synthetase of *Bacillus subtilis* is required for efficient sporulation. *Sci. Rep.* In Press.

167. Wang, S., Corcilius, L., Sharp, P.P., Rajkovic, A., **Ibba, M.**, Parker, B.L. and Payne, R.J. (2017) Synthesis of rhamnosylated arginine glycopeptides and determination of the glycosidic linkage in bacterial elongation factor P. *Chemical Science*. In Press.
166. Chaliotis, A., Vlastaridis, P., Mossialos, D., **Ibba, M.**, Becker, H.D., Stathopoulos, C. and Amoutzias, G. (2017) The complex evolutionary history of aminoacyl-tRNA synthetases. *Nucl. Acids Res.*, In Press.
165. Mohler, K., Mann, R. and **Ibba, M.** (2017) Isoacceptor specific characterization of tRNA aminoacylation and misacylation *in vivo*. *Methods* **113**, 127-131.
164. Elgamal, S., Artsimovitch, I. and **Ibba, M.** (2016) Maintenance of Transcription-Translation Coupling by Elongation Factor P. *mBio* **7**, e01373-16.
163. Moghal, A., Hwang, L., Faull, K. and **Ibba, M.** (2016) Multiple quality control pathways limit non-protein amino acid use by yeast cytoplasmic phenylalanyl-tRNA synthetase. *J. Biol. Chem.* **291**, 15796-15805.
162. Katz, A., Elgamal, S., Rajkovic, A. and **Ibba M.** (2016) Non-canonical roles of tRNAs and tRNA mimics in bacterial cell biology. *Mol. Microbiol.* **101**, 545-588.
161. Rajkovic, A., Hummels, K.R., Witzky, A., Erickson, S., Gafken, P.R., Whitelegge, J.P., Faull, K.F., Kearns, D.B. and **Ibba M.** (2016) Translation control of swarming proficiency in *Bacillus subtilis* by 5-amino-pentanoylated elongation factor P. *J. Biol. Chem.* **291**, 10976-10985.
160. Walker, M.A., Mohler, K.P., Hopkins, K.W., Oakley, D.H., Sweetser, D.A., **Ibba, M.**, Frosch, M.P. and Thibert, R.L. (2016) Novel compound heterozygous mutations expand the recognized clinical and neuropathologic phenotypes of FARS2-linked disease. *J. Child Neurology* **31**, 1127-1137.
159. Bullwinkle, T. and **Ibba, M.** (2016) Translation quality control is critical for bacterial responses to amino acid stress. *Proc. Natl. Acad. Sci. USA.* **113**, 2252-2257.
158. Rajkovic, A., Witzky, A., Navarre, W., Darwin, A.J. and **Ibba, M.** (2015) Elongation factor-P at the crossroads of the host-endosymbiont interface. *Microbial Cell* **2**, 360-362.
157. Rajkovic, A., Erickson, S., Witzky, A., Branson, O.E., Seo, J., Gafken, P.R., Frietas, M.A., Whitelegge, J.P., Faull, K.F., Navarre, W., Darwin, A.J. and **Ibba, M.** (2015) Cyclic rhamnosylated elongation factor P establishes antibiotic resistance in *Pseudomonas aeruginosa*. *mBio* **6** e00823-15.
156. Shepherd, J. and **Ibba, M.** (2015) Bacterial transfer RNAs. *FEMS Microbiol Rev.* **39**, 280-300.
155. **Ibba, M.** (2015) Transfer RNA comes of age. *RNA* **21**, 648-649.
154. Williams-Wagner, R.N., Grundy, F.J., Raina, M., **Ibba, M.** and Henkin, T.M. (2015) The *Bacillus subtilis* *tyrZ* gene encodes a highly selective tyrosyl-tRNA synthetase and is regulated by a MarR regulator and T box riboswitch. *J. Bacteriol.* **197**, 1624-1631.
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.**, Tynyismaa, 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-Mikulic, 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.
121. Zou, S.B., Roy, H., **Ibba, M.** and Navarre, W.W. (2011) Elongation factor P mediates a novel post-transcriptional regulatory pathway critical for bacterial virulence. *Virulence* **2**, 1-5.
120. Godinic-Mikulcic, V., Jaric, J., Hausmann, C.D., **Ibba, M.** and Weygand-Durasevic, I. (2011) An archaeal tRNA-synthetase complex that enhances aminoacylation under extreme conditions. *J. Biol. Chem.* **286**, 3396-3404.
119. Reynolds, N.M., Lazazzera, B.A. and **Ibba, M.** (2010) Cellular mechanisms that control mistranslation. *Nat. Rev. Microbiol.* **8**, 849-856.
118. Weygand-Durasevic, I. and **Ibba M.** (2010) New roles for codon usage. *Science* **329**, 1473-1474.
117. Roy, H. and **Ibba, M.** (2010) Bridging the gap between ribosomal and non-ribosomal protein synthesis. *Proc. Natl. Acad. Sci. USA* **107**, 14517-14518.
116. Santos, M.A.S., Orellana, O. and **Ibba, M.** (2010) Transfer RNA's latest port of call. *RNA Biology*, **7** 12-15.
115. Katz, A., Banerjee, R., de Armas, M. **Ibba, M.** and Orellana, O. (2010) Redox status affects the catalytic activity of glutamyl-tRNA synthetase. *Biochem. Biophys. Res. Comm.* **398**, 51-55.
114. Navarre, W.W., Zou, S., Roy, H., Xie, J.L., Savchenko, A., Singer, A., Edvokimova, E., Prost, L.R., Kumar, R., **Ibba, M.** Fang, F.C. (2010) PoxA, YjeK and elongation factor P coordinately modulate virulence and drug resistance in *Salmonella enterica*. *Mol. Cell* **39**, 209-221.
113. Goltermann, L., Larsen, M.S.Y., Banerjee, R., Joerger, A.C., **Ibba, M.** and Bentin, T. (2010) Protein evolution via amino acid and codon elimination. *PLoSOne* **5**, e10104.
112. Fredrick, K. and **Ibba, M.** (2010) How the sequence of a gene can tune its translation. *Cell* **141**, 227-229.
111. Reynolds, N.M., Ling, J., Roy, H., Banerjee, R., Repasky, S.E., Hamel, P. and **Ibba, M.** (2010) Cell-specific differences in the requirements for translational quality control. *Proc. Natl. Acad. Sci. USA* **107**, 4063-4068.
110. Banerjee, R., Chen, S., Dare, K., Gilreath, M., Praetorius-Ibba, M., Raina, M., Reynolds, N.M., Rogers, T., Roy, H., Yadavalli, S.S., **Ibba, M.** (2010) tRNAs: cellular barcodes for amino acids. *FEBS Letters* **584**, 387-395.
109. Roy, H. and **Ibba, M.** (2009) Broad range amino acid specificity of RNA-dependent lipid remodelling by multiple peptide resistance factors. *J. Biol. Chem.* **284**, 29677-29683
108. Yadavalli, S.S., Klipcan, L., Zozulya, A., Banerjee, R., Svergun, D. Safro, M. **Ibba, M.** (2009) Large-scale movement of functional domains facilitates aminoacylation by human mitochondrial phenylalanyl-tRNA synthetase. *FEBS Letters* **583**, 3204-3208.
107. Zeng, Y., Roy, H., Patil, P.B., **Ibba, M.** and Chen, S. (2009) Characterization of two seryl-tRNA synthetases in albomycin-producing *Streptomyces* sp. ATCC 700974. *Antimicrob. Agents Chemother.* **53**, 4619-4627.
106. Ataide, S.F., Rogers, T.E. and **Ibba, M.** (2009) The CCA anticodon specifies separate functions inside and outside translation in *Bacillus cereus*. *RNA Biology.* **6**, 479-487

105. Ling, J., Reynolds, N. and **Ibba, M.** (2009) Aminoacyl-tRNA synthesis and translational quality control. *Annu. Rev. Microbiol.* **63**, 61-78.
104. Ling, J., So, B.R., Yadavalli, S.S., Roy, H., Shoji, S., Fredrick, K., Musier-Forsyth, K. and **Ibba, M.** (2009) Resampling and editing of mischarged tRNA prior to translation elongation. *Mol. Cell* **33**, 654-660.
103. Fredrick, K. and **Ibba, M.** (2009) Errors rectified in retrospect. *Nature* **457**, 157-158.
102. Roy, H., Dare, K. and **Ibba, M.** (2009) Adaptation of the bacterial membrane to changing environments using aminoacylated phospholipids. *Mol. Microbiol.* **71**, 547-550.
101. Yadavalli, S.S., Musier-Forsyth, K. and **Ibba, M.** (2008) The return of pre-transfer editing in protein synthesis. *Proc. Natl. Acad. Sci. USA* **105**, 19031-19032.
100. Hausmann, C.D. and **Ibba, M.** (2008) Structural and functional mapping of the archaeal multi-aminoacyl-tRNA synthetase complex. *FEBS Letters* **582**, 2178-2182.
99. Hausmann, C.D. and **Ibba, M.** (2008) Aminoacyl-tRNA synthetase complexes: molecular multitasking revealed. *FEMS Microbiol. Rev.* **32**, 705-721.
98. Roy, H. and **Ibba, M.** (2008) RNA-dependent lipid remodeling by bacterial multiple peptide resistance factors. *Proc. Natl. Acad. Sci. USA* **105**, 4667-4672.
97. **Ibba, M.** (2008) Methods for studying aminoacyl-tRNA. *Methods* **44**, 73.
96. Roy, H. and **Ibba, M.** (2008) Monitoring Lys-tRNA^{Lys} phosphatidylglycerol transferase activity. *Methods* **44**, 164-169.
95. Ataide, S.F., Wilson, S.N., Dang, S., Rogers, T.E., Roy, B., Banerjee, R., Henkin, T.M. and **Ibba, M.** (2007) Mechanisms of resistance to an amino acid antibiotic that targets translation. *ACS Chemical Biology* **12**, 819-827.
94. Hausmann, C.D., Prætorius-Ibba, M. and **Ibba, M.** (2007) An aminoacyl-tRNA synthetase: elongation factor complex for substrate channeling in archaeal translation. *Nucleic Acids Res.* **35**, 6094-6102.
93. Ling, J., Yadavalli, S. and **Ibba, M.** (2007) Phenylalanyl-tRNA synthetase editing defects result in efficient mistranslation of phenylalanine codons as tyrosine. *RNA* **13**, 1881-1886.
92. Levensgood, J., Roy, H., Ishitani, R., Söll, D., Nureki, O., and **Ibba, M.** (2007) Anticodon recognition and discrimination by the α -helix cage domain of class I lysyl-tRNA synthetase. *Biochemistry* **46**, 11033-11038.
91. Ling, J., Roy, H., Qin, D., Rubio, M.A., Alfonzo, J.D., Fredrick, K. and **Ibba, M.** (2007) Pathogenic mechanism of a human mitochondrial tRNA^{Phe} mutation associated with MERRF syndrome. *Proc. Natl. Acad. Sci. USA* **104**, 15299-15304.
90. Godinic, V., Mocibob, M., Rocak, S., **Ibba, M.** and Weygand-Durasevic, I. (2007) Peroxin Pex21p interacts with C-terminal noncatalytic domain of yeast seryl-tRNA synthetase and forms a specific ternary complex with tRNA^{Ser}. *FEBS Journal* **274**, 2788-2799.
89. Hausmann, C.D., Ling, J. and **Ibba, M.** (2007) The unnatural culture of amino acids. *Nat. Methods* **4**, 205-206.
88. Prætorius-Ibba, M., Hausmann, C., Paras, M., Rogers, T.E. and **Ibba, M.** (2007) Functional association between three archaeal aminoacyl-tRNA synthetases. *J. Biol. Chem* **282**, 3680-3687.
87. Ling, J., Roy, H. and **Ibba, M.** (2007) Mechanism of tRNA-dependent editing in translational quality control. *Proc. Natl. Acad. Sci. USA.* **104**, 72-77.
86. Roy, H. and **Ibba, M.** (2006) Sticky end in protein synthesis. *Nature* **443**, 41-42.
85. Roy, H. and **Ibba, M.** (2006) Phenylalanyl-tRNA synthetase contains a dispensable RNA binding domain that contributes to editing of non-cognate aminoacyl-tRNA. *Biochemistry* **45**, 9156-9162.
84. Metlitskaya, A., Kazakov, T., Kommer, A., Pavlova, O., Prætorius-Ibba, M., **Ibba, M.** Krashennnikov, I., Kolb, V., Khmel, I. and Severinov, K. (2006) Aspartyl-tRNA synthetase is the target of peptidenucleotide antibiotic Microcin C. *J. Biol. Chem* **281**, 18033 - 18042.
83. Ataide, S.A. and **Ibba, M.** (2006) Small molecules - big players in the evolution of protein synthesis. *ACS Chemical Biology* **1**, 285 - 297.

82. Prætorius-Ibba, M., Ataide, S.F., Hausmann, C., Levensgood, J.D., Ling, J., Wang, S., Roy, H. and **Ibba, M.** (2006) Quality Control during aminoacyl-tRNA synthesis. *Chemistry in Industry* **55**, 129-134.
81. Wang, S., Prætorius-Ibba, M., Ataide, S., Roy, H. and **Ibba, M.** (2006). Discrimination of cognate and non-cognate substrates at the active site of class I lysyl-tRNA synthetase. *Biochemistry* **45**, 3646-3652.
80. Rubio, M.A.T., Ragone, F.L., Gaston, K.W., **Ibba, M.** and Alfonzo, J.D. (2006) C to U editing stimulates A to I editing in the anticodon loop of a cytoplasmic threonyl tRNA in *Trypanosoma brucei*. *J. Biol. Chem.* **281**, 115-120.
79. **Ibba, M.**, Francklyn, C., Cusack, S. (eds) (2005) *The Aminoacyl-tRNA Synthetases*. Georgetown, USA: Landes Bioscience.
78. Roy, H., Ling, J., Alfonzo, J.D. and **Ibba, M.** (2005) Loss of editing activity during the evolution of mitochondrial phenylalanyl-tRNA synthetase. *J. Biol. Chem.* **280**, 38186-38192.
77. Ataide, S.F., Jester, B.C., Devine, K.M. and **Ibba, M.** (2005) Stationary phase expression and aminoacylation of a tRNA-like small RNA. *EMBO Reports* **6**, 742-746.
76. Prætorius-Ibba, M., Rogers, T.E., Samson, R., Kelman, Z. and **Ibba, M.** (2005) Association between archaeal prolyl- and leucyl-tRNA synthetases enhances tRNA^{Pro} aminoacylation. *J. Biol. Chem.* **280**, 26099-26104.
75. Ambrogelly, A., Frugier, M., **Ibba, M.**, Söll, D. and Giegé, R. (2005) Transfer RNA recognition by class I lysyl-tRNA synthetase from the Lyme disease pathogen *Borrelia burgdorferi*. *FEBS Lett.* **579**, 2629-2634.
74. Sauerwald, A., Zhu, W., Major, T.A., Roy, H., Palioura, S., Jahn, D., Whitman, W., Yates, J.R. 3rd, **Ibba, M.** and Söll, D. (2005) RNA-dependent cysteine biosynthesis in archaea. *Science* **307**, 1969-1972.
73. **Ibba, M.** and Francklyn, C. (2004) Turning tRNA upside down: when aminoacylation is not a prerequisite to protein synthesis. *Proc. Natl. Acad. Sci. USA* **101**, 7493-7494.
72. **Ibba, M.** and Söll, D. (2004) Aminoacyl-tRNAs: Setting the limits of the genetic code. *Genes Dev.* **18**, 731-738.
71. Roy, H., Ling, J., Irnov and **Ibba, M.** (2004) Post-transfer editing *in vitro* and *in vivo* by the beta-subunit of phenylalanyl-tRNA synthetase. *EMBO J.* **23**, 4639-4648.
70. Ataide, S.F. and **Ibba, M.** (2004) Discrimination of cognate and non-cognate substrates at the active site of class II lysyl-tRNA synthetase. *Biochemistry* **43**, 11836-11841.
69. Korencic, D., Ahel, I., Schelert, J., Sacher, M., Ruan, B., Stathopoulos, C., Blum, P., **Ibba, M.** and Söll, D. (2004) A freestanding proofreading domain is required for protein synthesis quality control in Archaea. *Proc. Natl. Acad. Sci. USA* **101**, 10260-10265.
68. Bentin, T., Hamzavi, R., Salomonsson, J., Roy, H., **Ibba, M.** and Nielsen, P.E. (2004) Photoreactive bicyclic amino acids as substrates for mutant *Escherichia coli* phenylalanyl-tRNA synthetases. *J. Biol. Chem.* **279**, 19839-19845.
67. Levensgood, J.D., Ataide, S.F., Roy, H. and **Ibba, M.** (2004) Divergence in non-cognate amino acid recognition between class I and class II lysyl-tRNA synthetases. *J. Biol. Chem.* **279**, 17707-17714.
66. Söll, D. and **Ibba, M.** (2003) Aminoacyl-tRNA Synthetase Structure and Evolution. In *Translation Mechanisms* (Eds. J. Lapointe and L. Brakier-Gingras). Eurekah Press. pp 25-33.
65. Prætorius-Ibba, M. and **Ibba, M.** (2003) Aminoacyl-tRNA synthesis in archaea: different but not unique. *Mol. Microbiol.* **48**, 631-637.
64. Jester, B., Levensgood, J., Roy, H., **Ibba, M.** and Devine, K. (2003) Non-orthologous replacement of lysyl-tRNA synthetase prevents addition of lysine analogs to the genetic code. *Proc. Natl. Acad. Sci. USA* **100**, 14351-14356.
63. Ahel, I., Korencic, D., **Ibba, M.** and Söll, D. (2003) Trans-editing of mischarged tRNAs. *Proc. Natl. Acad. Sci. USA* **100**, 15422-15427.

62. Polycarpo, C., Ambrogelly, A., Ruan, B., Tumbula-Hansen, D., Ataide, S.F., Ishitani, R., Yokoyama, S., Nureki, O., **Ibba, M.** and Söll, D. (2003) Activation of the pyrrolysine suppressor tRNA requires formation of a ternary complex with class I and class II lysyl-tRNA synthetases. *Mol. Cell* **12**, 287-294.
61. Mejlhede, N., Monthan, A., Theisen, M. and **Ibba, M.** (2003) Differentiation of *Borrelia burgdorferi* sensu lato strains using class I lysyl-tRNA synthetase encoding genes. *Med Microbiol. Immunol.* **192**, 79-83.
60. **Ibba, M.** (2002) Elongating without arms. *Trends Biochem. Sci.* **27**, 548.
59. **Ibba, M.** (2002) DEAD-end job for RNA chaperone. *Trends Biochem. Sci.* **27**, 446.
58. **Ibba, M.** (2002) mRNA decay: the big picture. *Trends Biochem. Sci.* **27**, 335-336.
57. **Ibba, M.** and Söll, D. (2002) Genetic code: introducing pyrrolysine. *Curr. Biol.* **12**, R464-R466.
56. Stathopoulos, C., Ahel, I., Ali, K., Ambrogelly, A., Becker, H., Bunjun, S., Feng, L., Herring, S., Jacquin-Becker, Kobayashi, H., Korencic, D., Krett, B., Mejlhede, N., Min, B., Nakano, H., Namgoong, S., Polycarpo, C., Racznik, G., Rinehart, J., Rosas-Sandoval, G., Ruan, B., Sabina, J., Sauerwald, A., Toogood, H., Tumbula-Hansen, D., **Ibba, M.** and Söll, D. (2002) Aminoacyl-tRNA synthesis: a postgenomic perspective. *Cold Spring Harb. Symp. Quant. Biol.* **66**, 175-183.
55. **Ibba, M.** (2002) Eyeing up tryptophanyl-tRNA synthetase. *Trends Biochem. Sci.* **27**, 227.
54. **Ibba, M.** (2002) Biochemistry and bioinformatics: when worlds collide. *Trends Biochem. Sci.* **27**, 64; *Trends Biotechnol.* **20**, 53-54.
53. Ambrogelly, A., Korencic, D. and **Ibba, M.** (2002) Functional annotation of class I lysyl-tRNA synthetase phylogeny indicates a limited role for gene transfer. *J. Bacteriol.* **184**, 4594-4600.
52. Pavlickova, P., Jensen, N.M., Paul, H., Schaeferling, M., Giammasi, C., Kruschina, M., Du, W.D., Theisen, M., **Ibba, M.**, Ortigao, F. and Kambhampati, D. (2002) Antibody detection in human serum using a versatile protein chip platform constructed by applying nanoscale self-assembled architectures on gold. *J. Proteome. Res.* **1**, 227-231.
51. Terada, T., Nureki, O., Ishitani, R., Ambrogelly, A., **Ibba, M.**, Söll, D. and Yokoyama, S. (2002) Functional convergence of two lysyl-tRNA synthetases with unrelated topologies. *Nature Struct. Biol.* **9**, 257-262.
50. **Ibba, M.** (2001) Nonsense suppression in Archaea. *Trends Biochem. Sci.* **26**, 645.
49. **Ibba, M.** (2001) Nuclear translation: keeping a lookout for nonsense. *Trends Biochem. Sci.* **26**, 529.
48. Ruan, B., Ahel, I., Ambrogelly, A., Becker, H.D., Bunjun, S., Feng, L., Tumbula-Hansen, D., **Ibba, M.**, Korencic, D., Kobayashi, H., Jacquin-Becker, C., Mejlhede, N., Min, B., Racznik, G., Rinehart, J., Stathopoulos, C., Li, T. and Söll, D. (2001) Genomics and the evolution of aminoacyl-tRNA synthesis. *Acta Biochim. Pol.* **48**, 313-321.
47. **Ibba, M.** (2001) Discriminating right from wrong. *Science* **294**, 70-71.
46. **Ibba, M.**, Stathopoulos, C. and Söll, D. (2001) Protein synthesis: Twenty three amino acids and counting. *Curr. Biol.* **11**, R563-R565.
45. Mejlhede, N., Nielsen, P.E. and **Ibba, M.** (2001) Adding new meanings to the genetic code. *Nat. Biotechnol.* **19**, 532-533.
44. **Ibba, M.** and Söll, D. (2001) The renaissance of aminoacyl-tRNA synthesis. *EMBO Reports* **2**, 382-387.
43. Racznik, G., **Ibba, M.** and Söll, D. (2001) Genomics-based identification of targets in pathogenic bacteria for potential therapeutic and diagnostic use. *Toxicology* **160**, 181-189.
42. McCloskey, J.A., Graham, D.E., Zhou, S., Crain, P.F., **Ibba, M.**, Konisky, J., Söll, D. and Olsen, G.J. (2001) Post-transcriptional modification in archaeal tRNAs: identities and phylogenetic relations of nucleotides from mesophilic and hyperthermophilic *Methanococcales*. *Nucleic Acids Res.* **29**, 4699-706.
41. **Ibba, M.** and Söll, D. (2000) Aminoacyl-tRNA synthesis. *Annu. Rev. Biochem.* **69**, 617-650.
40. **Ibba, M.**, Becker, H.D., Stathopoulos, C., Tumbula, D.L. and Söll, D. (2000) The adaptor hypothesis revisited. *Trends Biochem. Sci.* **25**, 311-316.

39. Söll, D, Becker, H.D., Plateau, P., Blanquet, S. and **Ibba, M.** (2000) Context-dependent anticodon recognition by class I lysyl-tRNA synthetases. *Proc. Natl. Acad. Sci. USA*. **97**, 14224-14228.
38. Behrens, C., Nielsen, J.N., Fan, X.-J., Doisy, X., Kim, K.-H., Prætorius-Ibba, M., Nielsen, P.E. and **Ibba, M.** (2000) Development of strategies for the site-specific *in vivo* incorporation of photoreactive amino acids. *Tetrahedron* **56**, 9443-9449.
37. Woese, C.R., Olsen, G., **Ibba, M.** and Söll, D. (2000) Aminoacyl-tRNA synthetases, the genetic code, and the evolutionary process. *Microbiol. Mol. Biol. Rev.* **64**, 202-236.
36. Stathopoulos, C., Li, T., Longman, R., Vothknecht, U.C., Becker, H.D., **Ibba, M.** and Söll, D. (2000) One polypeptide with two aminoacyl-tRNA synthetase activities. *Science* **287**, 479-482.
35. Prætorius-Ibba, M., Stange-Thomann, N., Kitabatake, M., Ali, K., Söll, I., Carter, C.W. Jr., **Ibba, M.** and Söll, D. (2000) Ancient adaptation of the active site of tryptophanyl-tRNA synthetase for tryptophan binding. *Biochemistry* **39**, 13136-13143.
34. **Ibba, M.** and Söll, D. (1999) Quality control mechanisms during translation. *Science* **286**, 1893-1897.
33. Tumbula, D., Vothknecht, U.C., Kim, H.-S., **Ibba, M.**, Min, B., Li, T., Pelaschier, J., Stathopoulos, C., Becker, H. and Söll, D. (1999) Archaeal aminoacyl-tRNA synthesis: diversity replaces dogma. *Genetics* **152**, 1269-1276.
32. **Ibba, M.** and Bentin, T. (1999) Denmark lacks coherent policy on basic research. *Nature* **398**, 556.
31. **Ibba, M.**, Bunjun, S., Losey, H., Min, B. and Söll, D. (1999) Recognition of one tRNA by two classes of aminoacyl-tRNA synthetase. In *RNA Biochemistry and Biotechnology* (J. Barciszewski and B.F.C. Clark eds.). Kluwer Academic Publishers, Dordrecht. pp. 143-148.
30. **Ibba, M.**, Curnow, A.W., Bono, J.L., Rosa, P.A., Woese, C.R. and Söll, D. (1999) Archaeal aminoacyl-tRNA synthesis: unique determinants of a universal genetic code? *Biol. Bull.* **196**, 335-337.
29. **Ibba, M.** and Söll, D. (1999) In Vivo Synthesis of Proteins Containing Non-Natural Amino Acids: New Perspectives from Archaeal Enzymes. In *Biochemical Principles and Mechanisms of Biosynthesis and Biodegradation of Polymers* (A. Steinbuchel ed.). Wiley-VCH Verlag, Weinheim. pp. 203-210.
28. **Ibba, M.**, Sever, S., Prætorius-Ibba, M. and Söll, D. (1999) Transfer RNA identity contributes to transition state stabilization during aminoacyl-tRNA synthesis. *Nucleic Acids Res.* **27**, 3631-3637.
27. **Ibba, M.**, Losey, C.H., Kawarabayasi, Y., Kikuchi, H., Bunjun, S. and Söll, D. (1999) Substrate recognition by class I lysyl-tRNA synthetases: a molecular basis for gene displacement. *Proc. Natl. Acad. Sci. USA* **96**, 418-423.
26. Lenhard, B., Orellana, O., **Ibba, M.** and Weygand-Durasevic, I. (1999) tRNA recognition and evolution of determinants in seryl-tRNA synthesis. *Nucleic Acids Res* **27**, 721-729.
25. Hong, K.W., **Ibba, M.** and Söll, D. (1998) Retracing the evolution of amino acid specificity in glutaminyl-tRNA synthetase. *FEBS Lett.* **434**, 149-154.
24. Liu, J., **Ibba, M.**, Hong, K.W. and Söll, D. (1998) The terminal adenosine of tRNA^{Gln} mediates tRNA-dependent amino acid recognition by glutaminyl-tRNA synthetase. *Biochemistry* **37**, 9836-9842.
23. **Ibba, M.**, Bono, J.L., Rosa, P.A. and Söll, D. (1997) Archaeal-type lysyl-tRNA synthetase in the Lyme disease spirochete, *Borrelia burgdorferi*. *Proc. Natl. Acad. Sci. USA* **94**, 14383-14388.
22. **Ibba, M.**, Celic, I., Curnow, A.W., Kim, H.S., Pelaschier, J., Tumbula, D., Vothknecht, U.C., Woese, C.R. and Söll, D. (1997) Aminoacyl-tRNA synthesis in Archaea. *Nucl. Acids Symp. Ser.* **37**, 305-306.
21. Freist, W., Gauss, D.H., **Ibba, M.** and Söll, D. (1997) Glutaminyl-tRNA synthetase. *Biol. Chem.* **378**, 1103-1117.
20. **Ibba, M.**, Curnow, A.W. and Söll, D. (1997) Aminoacyl-tRNA synthesis: divergent routes to a common goal. *Trends Biochem. Sci.* **22**, 39-42.
19. **Ibba, M.**, Morgan, S., Curnow, A.W., Pridmore, D.R., Vothknecht, U.C., Gardner, W., Lin, W., Woese, C.R. and Söll, D. (1997) A euryarchaeal lysyl-tRNA synthetase: resemblance to class I synthetases. *Science* **278**, 1119-1122.

18. Kitabatake, M., **Ibba, M.**, Hong, K.W., Söll, D. and Inokuchi, H. (1996) Genetic analysis of functional connectivity between substrate recognition domains of *Escherichia coli* glutaminyl-tRNA synthetase. *Mol. Gen. Genet.* **252**, 717-722.
17. Curnow, A.W., **Ibba, M.** and Söll, D. (1996) tRNA-dependent asparagine formation. *Nature* **382**, 589-590.
16. **Ibba, M.** and Söll, D. (1996) Protein-RNA molecular recognition. *Nature* **381**, 656. ". *Nature* **384**, 422.
15. **Ibba, M.** (1996) Strategies for *in vivo* and *in vitro* translation with non-natural amino acids. *Biotech. Genet. Rev.* **13**, 197-216.
14. **Ibba, M.**, Hong, K.W. and Söll, D. (1996) Glutaminyl-tRNA synthetase: from genetics to molecular recognition. *Genes Cells* **1**, 429-436.
13. **Ibba, M.**, Hong, K.W., Sherman, J.M., Sever, S. and Söll, D. (1996) Interactions between transfer RNA identity nucleotides and their recognition sites in glutaminyl-tRNA synthetase determine the cognate amino acid affinity of the enzyme. *Proc. Natl. Acad. Sci. USA* **93**, 6953-6958.
12. Hong, K.W., **Ibba, M.**, Weygand-Durasevic, I., Rogers, J.M., Thomann, H-U. and Söll, D. (1996) Transfer RNA-dependent cognate amino acid recognition by an aminoacyl-tRNA synthetase. *EMBO J.* **15**, 1983-1991.
11. Thomann, H-U., **Ibba, M.**, Hong, K.W. and Söll, D. (1996) Homologous expression and purification of mutants of an essential protein by reverse epitope-tagging. *Nat. Biotechnol.* **14**, 50-55.
10. **Ibba, M.**, Thomann, H-U., Hong, K.W., Sherman, J.M., Weygand-Durasevic, I., Sever, S., Stange-Thomann, N., Praetorius, M. and Söll, D. (1995) Substrate selection by aminoacyl-tRNA synthetases. *Nucl. Acids Symp. Ser.* **33**, 40-42.
9. Lloyd, A.J., Thomann, H-U., **Ibba, M.** and Söll, D. (1995) Cooperativity of tRNA binding in glutaminyl-tRNA synthetase monitored by a novel continuous spectrophotometric assay. *Nucl. Acids Res.* **23**, 2886-2892.
8. **Ibba, M.** and Hennecke, H. (1995) Relaxing the substrate specificity of an aminoacyl-tRNA synthetase allows *in vitro* and *in vivo* synthesis of proteins containing unnatural amino acids. *FEBS Lett.* **364**, 272-275.
7. **Ibba, M.**, Johnson, C.M., Hennecke, H. and Fersht, A.R. (1995) Increased rates of tRNA charging through modification of the enzyme-aminoacyl-adenylate complex of phenylalanyl-tRNA synthetase. *FEBS Lett.* **358**, 293-296.
6. **Ibba, M.** and Hennecke, H. (1994) Towards engineering proteins by site-directed incorporation *in vivo* of non-natural amino acids. *Nat. Biotechnol.* **12**, 678-682.
5. **Ibba, M.**, Kast, P. and Hennecke, H. (1994) Substrate specificity is determined by amino acid binding pocket size in *Escherichia coli* phenylalanyl-tRNA synthetase. *Biochemistry* **33**, 7107-7112.
4. **Ibba, M.**, Kuhla, J., Smith, A. and Küenzi, M. (1993) Stable continuous constitutive expression of a heterologous protein in *Saccharomyces cerevisiae* without selection pressure. *Appl. Microbiol. Biotechnol.* **39**, 526-531.
3. **Ibba, M.**, Bonarius, D., Kuhla, J., Smith, A. and Küenzi, M. (1993) Mode of cultivation is critical for the optimal expression of recombinant hirudin by *Saccharomyces cerevisiae*. *Biotechnol. Lett.* **15**, 667-672.
2. **Ibba, M.** and Fynn, G.H. (1991) Two stage methanogenesis of glucose by *Acetogenium kivui* and Methanogenic Sp. *Biotechnol. Lett.* **13**, 671-676.
1. **Ibba, M.**, Taylor, S.J.C., Weedon, C.M., and Mantle, P.G. (1987) Submerged fermentation of *Penicillium paxilli* biosynthesizing paxilline, a process inhibited by calcium induced sporulation. *J. Gen. Microbiol.* **133**, 3109-3119.

PATENTS

1. Söll, D. and **Ibba, M.** (2002) Class I-type lysyl-tRNA synthetase. US Patent number 6,492,131.