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## Emmanuel Peprah, Ph.D.

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- 2010- Present      **Research Fellow – Center for Research on Genomics and Global Health**  
National Human Genome Research Institute (NHGRI) National Institutes of Health (NIH)
- Research Component:* Human Heredity and Health in Africa (H3Africa) Initiative  
*Research Mentor:* Charles Rotimi, Director CRGGH
- 2006-2010      **Postdoctoral Training – Fellowships In Research and Science Teaching (FIRST)**
- Emory University School of Medicine, Atlanta, Georgia*  
*Research Component:* Fragile X syndrome (FXS) is caused by a trinucleotide expansion in exon 1 of the Fragile X mental retardation-1 (*FMR1*) gene and has been studied in many ethnically diverse populations. However, elucidations of the trinucleotide repeat structure in African populations has not occurred. We characterized the allelic frequencies and structure of the *FMR1* locus in an African population.  
*Research Mentor:* Stephanie Sherman, Professor of Human Genetics
- Spelman College, Atlanta, Georgia*  
*Teaching Component:* Pedagogy relating to undergraduate Cellular and Molecular Biology teaching (*Bio 471*)  
*Teaching Mentor:* Latanya Hammonds-Odie, Assistant Professor of Biology
- Morehouse College, Atlanta, Georgia*  
*Teaching Component:* Biological Research (*Bio 381/382*)  
*Teaching Mentor:* J.K. Haynes, David Packard Professor and Dean of Science and Mathematics
- 2001-2006      **Ph.D. – Molecular Biology & Biomedical Science**  
*Meharry Medical College, Nashville, Tennessee*  
*Research Mentor:* Minu Chaudhuri, Assistant Professor, Division of Microbial Pathogenesis and Immune Response  
*Dissertation:* Characterization of a Protein Translocator of the Inner Mitochondrial Membrane from *Trypanosoma brucei brucei*.
- 1995-1999      **B.S. – Biology (Interdisciplinary Studies Minor)**  
*Texas A&M University, Commerce, Texas*

### Research Experience

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- Fall 2006-2010      **Postdoctoral Fellowship:** *Emory University, Atlanta, Georgia, Department of Human Genetics*  
Advisor: Stephanie Sherman
- Postdoctoral training involving several projects: Determined the expression level of fragile-X mental retardation protein (FMRP) in several normal, premutation, and full mutation individuals to characterize the protein levels in these individuals. Performed sequencing and genotyping on a large cohort of African males to determine the CGG/AGG interspersions and elucidate the mechanism of CGG array expansion in this population. To unravel possible underlying molecular mechanisms of Premature Ovarian Failure, murine ovaries of Fragile-X mouse model were examined to determine the status premutation alleles have on ovary morphology and structure.

2001- 2006

**Doctoral Research:** Meharry Medical College, Nashville, Tennessee, Division of Microbial Pathogenesis and Immune Response  
Advisor: Minu Chaudhuri

Project: Dissertation research focused on characterization of the Tim17, a predicted protein of *Trypanosoma brucei brucei*, and elucidation of protein function for mitochondrial protein import and parasite viability. To meet this goal, BLAST analysis of *T. brucei* genome was conducted using yeast Tim17 as a query. Methods to characterize *Trypanosoma brucei brucei* Tim17 included cloning of TbTim17 cDNA; functional analysis of TbTim17 in *Trypanosoma brucei brucei* via protein import assays and characterization of the TIM23 complex in *Trypanosoma brucei brucei*. In addition, tetracycline inducible RNAi system specific for *Trypanosoma brucei brucei* was used to determine the essentiality of the protein for mitochondrial import of the procyclic or insect form of the *Trypanosoma brucei brucei* and creation of antibodies to determine various characteristics of the protein including size and method of assembly. Flow cytometry was used to further characterize the cell cycle progression of procyclic cells under the RNAi constructs. Northern analysis was used to determine if knockdown of Tim17 had an effect on several cytosolic and mitochondrial proteins at the transcript level.

## Publications

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Peprah, E., Sherman, SL. (2010) Origins of the fragile X repeat instability and prevalence among world populations (review in preparation)

Peprah, E., Allen, E., Williams, S., Woodard, L., Sherman, SL. (2010) Genetic diversity of the fragile X syndrome gene (*FMR1*) in a large Sub-Saharan West African population. *Annals of Human Genetics* (74)316-325

Peprah, E., He, W., Allen, E., Oliver, T Boyle, A., and Sherman, SL., (2010) Examination of *FMR1* transcript and protein levels among 74 premutation carriers. *Journal of Human Genetics* (55) 66-68

Singha, UK., Peprah, E., Williams, S., Walker, R., Saha, L., Chaudhuri, M., (2008) Characterization of the mitochondrial inner membrane protein translocator Tim17 form *Trypanosoma brucei*. *Molecular & Biochemical Parasitology*, 159 (1) 30-43.

Peprah, E., Saha, L., and Chaudhuri, M. (2006) *Trypanosoma brucei* Tim17 is essential for cell survival and mitochondrial biogenesis. *Proceeding of the 11th International Congress of Parasitology*, pp. 53-57.

## Abstracts

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Emmanuel Peprah, Weyia He, Emily Allen, Tiffany Oliver and Stephanie L. Sherman (2008) Possible implication of mRNA folding on the translation of *FMR1* transcript on FMRP levels among normal and premutation carriers. American Society of Human Genetics (ASHG) 58<sup>th</sup> Annual meeting, Philadelphia, PA

Emmanuel Peprah, Montreka Dansby, Colleen Crittenden, Amanda Freeman, Jeffery Handy, Brandi Brandon Knight, Joy Owen, Kyla Ross. (2008) Assessment of the effectiveness of peer presentations on undergraduates' perceptions toward graduate and professional schools. Institutional Research and Academic Career Development Award (IRACDA) Conference hosted by the SPIRE program at the University of North Carolina, Chapel Hill, NC

Emmanuel Peprah, Weyia He, Emily Allen, Tiffany Oliver and Stephanie L. Sherman (2008) Possible implication of mRNA folding on the translation of *FMR1* transcript on FMRP levels among normal and premutation carriers. Postdoctoral Fellow Research Symposium, Emory University, Atlanta GA

Emmanuel Peprah, Emily Allen, Scott Williams and Stephanie Sherman. (2007) Analysis of the genetic diversity of the Fragile X syndrome gene *FMR1* within a large Sub-Saharan West African population. African Society of Human Genetics (AfSHG) Meeting, Cairo, Egypt

Emmanuel Peprah, Emily Allen, Weyia He, Jessica Hunter and Stephanie Sherman. (2007) Effect of *FMR1* CGG repeat size on Fragile X mental retardation protein (FMRP) levels among normal and premutation carriers. American Society for Cell Biology 47<sup>th</sup> Annual Meeting, Washington, DC.

Emmanuel Peprah and Minu Chaudhuri. (2006) Role of *Trypanosoma brucei* Tim17 during cell survival and cell cycle progression *FASEB J.* 2006 20:A493

Minu Chaudhuri, Emmanuel Peprah and Lipi Saha. (2006) *Trypanosoma brucei* Tim17 is essential for cell cycle progression and cell morphology. Proceedings, 11<sup>th</sup> International Congress on Parasitology

Emmanuel Peprah and Minu Chaudhuri. (2004) Expression and mitochondrial targeting of *Neurospora crassa* Tom40 in *Trypanosoma brucei* bloodstream form. FASEB Protein Society Conference

## Presentations at Conferences & Symposiums

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- 2009 *Institutional Research and Academic Career Development Award (IRACDA) Conference, San Francisco, CA*  
Hosted by the IRACDA Scholars in Science (ISIS) program on behalf of the University of San Francisco and San Francisco State University
- 2008 *Institutional Research and Academic Career Development Award (IRACDA) Conference, Chapel Hill, NC*  
**Invited Oral Presentation**  
"Assessment of the effectiveness of peer presentations on undergraduates' perceptions toward graduate and professional schools" hosted by the SPIRE program at the University of North Carolina at Chapel Hill
- 2008 *Institutional Research and Academic Career Development Award (IRACDA) Conference, Chapel Hill, NC*  
Poster Presentation  
"Possible implication of mRNA folding on the translation of *FMR1* transcript on FMRP levels among normal and premutation carriers"
- 2008 *Postdoctoral Fellow Research Symposium, Emory University, Atlanta, GA*  
Poster Presentation  
"Possible implication of mRNA folding on the translation of *FMR1* transcript on FMRP levels among normal and premutation carriers"  
Hosted by Emory University Office of Postdoctoral Education
- 2007 *African Society of Human Genetics (AfSHG) Meeting, Cairo, Egypt*  
Poster Presentation  
"Analysis of the genetic diversity of the Fragile X syndrome gene *FMR1* within a large Sub-Saharan West African population"
- 2007 *American Society for Cell Biology 47<sup>th</sup> Annual Meeting, Washington, DC.*  
Poster Presentation  
"Effect of *FMR1* CGG repeat size on Fragile X mental retardation protein (FMRP) levels among normal and premutation carriers"
- 2007 *Network of Minority Research Investigators (NMRI) Southern Regional Workshop, Atlanta, Georgia.*  
Poster Presentation  
"Effect of *FMR1* CGG repeat size on Fragile X mental retardation protein (FMRP) levels among normal and premutation carriers"
- 2006 *FASEB Experimental Biology Meeting, San Francisco, California*  
Poster Presentation  
"Role of *Trypanosoma brucei* Tim17 during cell survival and cell cycle progression"
- 2005 *Meharry Medical College Student Research Day, Nashville, Tennessee*  
Poster Presentation  
"Cloning and characterization of the Translocase of inner mitochondrial membrane protein Tim17 from *Trypanosoma brucei*"
- 2004 *Protein Society Conference Meeting, San Diego, California*  
Poster Presentation  
"Expression and mitochondrial targeting of *Neurospora crassa* Tom40 in *Trypanosoma brucei* bloodstream form."
- 2003 *Meharry Medical College Student Research Day, Nashville, Tennessee*  
Poster Presentation

“Characterization of a novel mitochondria protein from *Trypanosoma brucei*: Is it a component of the *T. brucei* TOM complex”

## Teaching Experience

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- Spring 2010      **Course Lecturer:** *Biological Research, Morehouse College, Atlanta, Georgia*  
**Biological Research – Bio 381/382**
- Course examined basic principles of research methodology with specific emphasis on exposing students to research and developing analytical and presentation skills. Students applied basic concepts of scientific inquiry to supervised research project with approved faculty member. Course provided framework for critical examination of research in the biological, chemical, physical, environmental, social and computer/information sciences.
- Spring 2007      **Course Lecturer:** *Cellular and Molecular Biology, Spelman College, Atlanta, Georgia*  
**Molecular and Cellular Biology - Bio 471**
- Designed, organized and implemented lectures in molecular biology for students outlining core principles and goals of each lecture (Karp, *Cellular and Molecular Biology: Concepts and Experiments*, 4<sup>th</sup> Ed., Study Aid: *Problems Book and Study Guide* by Nancy L. Pruitt). Utilized various innovative teaching styles including case studies to demonstrate how biological principles work in conjunction. Engaged in the design and assessment of student progress following lectures.
- Spring 2007      **Course Lecturer & Participant:** *Emory University, Department of Biology, Atlanta, Georgia*
- Participated in lecture course “Biology of Water: A Class within a Class”. FIRST class designed for fellows to obtain teaching experience. Designed, organized and implemented lectures in Biology of Water. Utilized various innovative teaching styles including team teaching. Participated in course development. Presented lectures to postdoctoral fellows and instructor. Participated in various workshops for effective teaching.
- 2003-2006      **Teaching Assistant:** *Meharry Medical College, Department of Microbiology, Nashville, Tennessee*  
**Foundations in Cell Biology and Genetics – MICR 712**
- Organized additional class sections and reviewed lecture concepts. (Lehninger, *Molecular Biology of the Cell*, 4<sup>th</sup> Ed.). Lab component included guidance through critical thinking questions of the above systems in addition to experiments such as western blotting and DNA purification. Provided tutoring services to matriculating students. Proctored exams and effectively communicated with diverse student populations.
- 1999-2001      **Science Teacher:** *Seagoville High School, Dallas Public School, Dallas, Texas*
- Prepared lecture material for courses including Biology, Health, Chemistry & Physics. Designed lessons, organized and implemented experiments in Biology, Chemistry, Health, and Physics. Taught concepts including note taking and laboratory techniques to secondary students. Provided tutoring services for high students. Designed and implemented lesson strategies for mentally challenged students. Engaged parents in conferences to communicate student accomplishments and deficits. Represented institution at off-site visits to other Dallas secondary campuses. Operated in pressure intensive environments. Moderated peer mediation by students for conflict resolution. Effectively communicated with people and students from diverse populations
- 1996-1999      **Student & Teaching Assistant:** *Texas A&M University - Commerce, Commerce, Texas*
- Provided tutoring services to biology students. Evaluated student performance and implemented plans for students to achieve academic goals
- 1996-1999      **Student Volunteer & Mentor:** *Boys & Girls Club of Commerce, Commerce, Texas*
- Actively tutored and mentorship at risk adolescents. Implemented conflict resolution for various altercations. Educated students on effective study strategies. Evaluated adolescents on school performance and implemented plans to help students achieve academic goals.

## Formal Pedagogical Training

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- August 2006-2010      Postdoctoral Fellowship: *Fellowships In Research and Science Training (FIRST) Program, Emory University School of Medicine, Atlanta, Georgia*
- The NIH-funded FIRST program provides fellowship support for biomedical research and training for teaching science, as well as the resources for pedagogical training and professional development. Each fellow chooses a research mentor from participating Emory faculty that oversees traditional research training. In addition to the research mentor, another teaching-mentor is selected from one of the Minority Serving Institutions of the Atlanta University Center (AUC). Typically, FIRST fellows become adjunct faculty and assist their mentors in teaching responsibilities such as lecturing, tutoring, and course design. In addition to these activities, FIRST fellows are expected to participate in various workshops and seminars that are focused on teaching methodologies and professional development.
- June 2009      *Institutional Research and Academic Career Development Award (IRACDA) Conference, San Francisco, CA*  
Hosted by the IRACDA Scholars in Science (ISIS) program on behalf of the University of San Francisco and San Francisco State University
- June 2008      *Institutional Research and Academic Career Development Award (IRACDA) Conference, North Carolina Chapel Hill, North Carolina*  
Teaching Workshops:  
  
"Approaches to Education, Teaching, and what works and what doesn't".  
"Backwards Course Design" presented by Dr. Ed Neal - UNC Center for Teaching and Learning
- June 2008      Implementing Instructional Technology into Pedagogy (web design): *Sponsored by Emory's Center for Interactive Teaching (ECIT) and FIRST, Emory University, Atlanta, Georgia*
- Week long intensive workshop providing the basis for designing websites and utilizing internet based applications to enhance the learning experience for students. Discussed blogs, wikis, online assessments and proper utilization of email to enhanced course learning.
- March 2008      Podcasting Workshop: *Sponsored by Emory's Center for Interactive Teaching (ECIT) and FIRST, Emory University, Atlanta, Georgia*
- Podcasting Workshop provided framework for developing flexibility in Pedagogy by utilizing new technology, which allows one to successfully engage today's learners in various types of learning environments. Hands-on editing and creation of various aspects of podcasting was conducted and key topics were discussed including: audio podcasts; enhanced or video podcasts (vodcasts); and Web 2.0 technologies.
- July 2007-September 2007      Teaching Workshop: *Teaching Undergraduate Science (TUGS), Center for Science Education, Emory University, Atlanta, Georgia*  
Topics discussed:
- Pedagogical techniques that Can Expand the Classroom
  - Teacher vs. Student centered learning environment
  - Use of technology to help student comprehend materials
  - Assessment to foster student learning
- June 2007      Postdoctoral / Junior Faculty Workshop: *Sponsored by Minority Affairs Committee of American Society of Cell Biology, Marine Biological Laboratory, Woods Hole, MA*  
Professional development for postdoctoral fellows and faculty on teaching and research careers in academia and industry. At the conference, challenges faced by minority investigators in academia were discussed.

- June 2007 *Institutional Research and Academic Career Development Award (IRADCA) Retreat, San Diego, California*  
Topics:
- How Pedagogical Technologies Can Expand the Classroom
  - Science Without Borders: Creating Critical Thinking Exercises
  - NIH: Dispelling Myths about New Awards
- March 2007 Case Study Workshop: *Organized by FIRST fellows, Emory University, Atlanta, Georgia*  
Workshop presented by Clyde Herreid Ph.D., Distinguished Teaching Faculty from University of Buffalo. In the workshop, fellows were introduced to various ways to effectively design and introduce case studies into a course. Fellows participated in various case study scenarios.
- 2006-2010 FIRST monthly Seminars. *Organized by FIRST fellows, Emory University, Atlanta, Georgia*  
Seminars presented by FIRST fellows over postdoctoral research and teaching techniques. Topics include but not limited to:
- Negotiating salaries
  - When to choose certain teaching styles
  - Using body language to control classroom attentiveness
  - Efficient grading systems and excel training
- 1999- 2001 Teaching Workshop: *Science Teachers Access to Resources at Southwestern (STARS) Program, University of Texas Southwestern, Dallas, Texas*  
UT Southwestern faculty from various disciplines discussed various advancements in research and technology, which could be incorporated into high school science courses. Dallas Public School teachers interacted with UT Southwestern faculty, which led to high school students participating in summer research.
- August 1999-2001 Teaching Workshop: *Dallas Public Schools Teachers Workshop: Seagoville HS, Dallas, Texas*  
Topics:
- Cultural issues of Latinos and African American in secondary and higher education
  - Introduction to Pre Advance Placement Biology
  - Cultural barriers to science learning

## **Career Development Training**

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- June 2008 *Institutional Research and Academic Career Development Award (IRACDA) Conference, North Carolina Chapel Hill, North Carolina*  
Meeting topics included:
- Financial Planning Seminar for IRACDA Scholars
  - Approaches to Research-based Courses in Science
  - Genetic Scale-up Goes Public - Genotyping in the Consumer World
- July 2007-September 2007 *Teaching Undergraduate Science (TUGS), Center for Science Education, Emory University, Atlanta, Georgia*  
Topics discussed:
- Pedagogical techniques that Can Expand the Classroom
  - Teacher vs. Student centered learning environment
  - Use of technology to help student comprehend materials
  - Creating assessments to foster student learning
- June 2007 Postdoctoral / Junior Faculty Workshop: *Sponsored by Minority Affairs Committee of American Society for Cell Biology, Marine Biological Laboratory, Woods Hole, Massachusetts*  
Professional development for postdoctoral fellows and faculty on teaching and research career in academia and industry. At the conference, challenges faced by minority investigators in academia were discussed.
- June 2007 *Institutional Research and Academic Career Development Award (IRADCA) Conference, San Diego, California*  
Topics:
- How Pedagogical Technologies Can Expand the Classroom
  - Science Without Borders: Creating Critical Thinking Exercises
  - NIH: Dispelling Myths about New Awards

- May 2007                      *Emory Executive Development Workshop, Goizueta Business School at Emory University, Atlanta, Georgia*  
*Topics:*
- The Birkman Method as a tool for identifying leadership strengths and weaknesses
  - Team Communication Processes

**Fellowships**

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August 2006 –2010    *Fellowships in Research and Science Teaching (FIRST)*  
National Institutes of Health  
Emory University

May 2002-July 2006    *T32 Molecular Microbial Pathogenesis Training Grant*  
National Institutes of Allergy and Infectious Diseases  
Meharry Medical College

August 2001-April 2002    *Research Initiative for Scientific Enhancement (RISE) Grant*  
National Institutes of Health  
Meharry Medical College

**Selected Awards/Honors**

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- June 2008                      Leadership Award, Postdoctoral Fellows Research Symposium Committee, Emory University, Atlanta, GA
- December 2007                Placed 2<sup>nd</sup> in Postdoctoral Poster Presentation at Minority Affairs Committee Contest at the American Society of Cell Biology 47<sup>th</sup> Annual Meeting. Washington, DC
- December 2007                Travel Award: American Society for Cell Biology 47<sup>th</sup> Annual Meeting. Washington, DC
- June 2007                      Travel Award: American Society for Cell Biology, Minority Affairs Committee. Woods Hole, MA
- August 2007-2010            ‘Fellowships In Research and Science Teaching’ (FIRST) program. Atlanta, GA
- April 2006                      Travel Award: Federation of American Societies for Experimental Biology (FASEB) Minority Access to Research Careers (MARC), San Francisco, CA
- 2004 -2005                      National Dean’s List. Meharry Medical College. Nashville, TN
- May 2004                        Protein Society (FASEB) Minority Travel Award San Diego, CA
- 2002, 2004                      The Elizabeth Woodard Memorial Scholarship, Meharry Medical College. Nashville, TN
- 2002-2006                      Dean’s List – Meharry Medical College. Nashville, TN
- 1999-2001                      University of Texas Southwestern Teachers Workshop. Dallas, TX
- 2000                              District Representative, Dallas Public Schools, Dallas, TX
- 1999                              Dean’s List – Texas A&M University-Commerce. Commerce, TX

**Selected Volunteer & Leadership Activities**

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2008                              Research Symposium Committee, Office of Postdoctoral Education  
Emory University, Atlanta, GA

2008 Judge, Intel International Science and Engineering Fair (ISEF)  
Georgia World Congress Center, Atlanta, GA

2008 Guest Speaker, Benjamin Mays High School, Atlanta, GA

2006 Community Day Volunteer, Nashville, TN

2006 Hands Across Nashville Volunteer, Nashville, TN

2005 Habitat for Humanity Volunteer, Nashville, TN

2004 Reestablishment of Kappa Chapter, Phi Beta Sigma Fraternity, Inc. Meharry Medical College, Nashville, TN

2001-2006 Guest Speaker, Various High Schools, Nashville, TN

1995-2001 Operated Canned food drive for the Homeless, Commerce, TX

1997 Participated in peer mentoring of elementary school Children, Commerce, TX

1996-1999 President, Vice President and Secretary, Eta Zeta Chapter of Phi Beta Sigma Fraternity, Inc.

1996-1999 Boys and Girls Club of Commerce, working with at-risk youth, Commerce, TX

### **Affiliations**

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2008 American Society for Cell Biology

2008 American Society of Human Genetics

2008 African Society of Human Genetics

2007 Network of Minority Research Investigators (NMRI)