

Mohamed A. Ghazy, Ph. D.
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EDUCATION

- 2004 Ph.D.** Biochemistry & Molecular Biology, School of Medicine and Biomedical Sciences, State University of New York at Buffalo, Buffalo, NY, USA.
- 1998 Master of Science,** Biochemistry & Molecular Biology, Faculty of Science, Ain Shams University, Cairo, Egypt.
- 1993 Bachelor of Science,** Biochemistry, Faculty of Science, Ain Shams University, Cairo, Egypt.

ACADEMIC APPOINTMENTS

- 2015 - Present** Professor, Department of Biochemistry, Faculty of Science, Ain Shams University, Cairo, Egypt.
- 2010 - 2015** Associate Professor, Department of Biochemistry, Faculty of Science, Ain Shams University, Cairo, Egypt.
- 2004 - 2010** Assistant Professor, Department of Biochemistry, Faculty of Science, Ain Shams University, Cairo, Egypt.
- 1993- 2000** Assistant Lecturer, Department of Biochemistry, Faculty of Science, Ain Shams University Cairo, Egypt.
- 2012 - 2014** Adjunct Professor, Biotechnology / BioMolecular Chemistry Program, School of Science, Cairo University, Giza, Egypt.
- 2012 - 2014** Adjunct Professor, School of Biotechnology, October University for Modern Sciences & Arts, Giza, Egypt.
- 2010 - 2014** Adjunct Professor, Department of Biology, School of Sciences and Engineering, The American University in Cairo, Cairo, Egypt.
- 2008 - 2009** Adjunct Professor, Science, Technology, Engineering and Math Division, Roxbury Community College, Roxbury Crossing, MA, USA.
- 2007 - 2008** Instructor, Department of Biochemistry, School of Medicine, Tufts University, Boston, MA, USA.

TEACHING / MENTORING

Teaching Experience

- Department of Biochemistry, Faculty of Science, Ain Shams University, Cairo, Egypt.
Protein and Porphyrin Metabolism
Molecular Biology and Genetic Engineering
General Biochemistry
Carbohydrate Metabolism
Biological Information Transfer (Graduate Level)
Bioinformatics (Graduate Level)

- Department of Biology, School of Sciences and Engineering, The American University in Cairo, Cairo, Egypt.
Genetics
Introductory Biology
Molecular / Cell Biology

- School of Biotechnology, October University for Modern Sciences & Arts, Giza, Egypt.
Molecular Basis of Cancer

- Biotechnology/ BioMolecular Chemistry Program, School of Science, Cairo University, Giza, Egypt.
Modern Methods in Molecular Biology
RNA Interference

- Science, Technology, Engineering and Math Division, Roxbury Community College, Roxbury Crossing, MA, USA.
Biology I
Microbiology

- Department of Biochemistry, School of Medicine, Tufts University, Boston, MA, USA.
Medical Biochemistry (Small Group Discussion Leader)

- Post-baccalaureate program at School of Medicine and Biochemical Sciences, State University of New York at Buffalo, Buffalo, USA.
Biochemistry
Molecular Biology

Teaching Assistant

- Supervised the laboratory training of 3rd and 4th year undergraduate biochemistry students at Ain Shams University Cairo, Egypt. Responsibilities included: class planning, teaching, preparing evaluations of students, leading discussion groups on

basic concepts of biochemistry for third year students, and leading fourth year discussion groups on basic concepts of microbial biochemistry and blood chemistry.

Mentorship

- *Undergraduate research projects* in Dr. Claire Moore's lab, Department of Molecular and Microbiology, School of Medicine, Tufts University Boston, MA, USA.
- *Undergraduate research graduation project* for twenty students at Faculty of Science, Ain Shams University, and October University for Modern Sciences & Arts, Giza, Egypt.
- *Graduate rotation students* in Dr. Claire Moore's lab, Department of Molecular and Microbiology, School of Medicine, Tufts University Boston, MA, USA.
- *Master Students* at Department of Biochemistry, Faculty of Science, Ain Shams University, Cairo, Egypt. **Thesis entitled:**
 - Evaluation of New Biochemical and Molecular Markers as Predictors of Chronic Obstructive Pulmonary Disease (2011-2015).
 - A New Therapeutic Approach for Hepatocellular Carcinoma Using Micro-RNA Molecules with Potential Impact (2012-2016).
- *Master Students* at Department of Biology, School of Sciences and Engineering, The American University in Cairo, Cairo, Egypt. **Thesis entitled:**
 - Mining Red Sea Atlantis II Brine for Halophilic Endoglucanases. (2010-2011)
 - Mining and Identification of Potential Serine Proteases from the Lower Convective Layer of the Atlantis II Brine Pool in the Red Sea. (2010-2012)
 - Identification of Potential Subtilisin-like Serine Proteases from the Microbial Community of the Red Sea Atlantis-II Brine Pool Using a Metagenomic Approach. (2011-2013)
 - *In silico* Identification of Potential Biomass and Cell Wall Degrading Enzymes in the Microbial Community of the Red Sea Atlantis-II Brine Pool Using a Metagenomic Approach. (2012-2014)
 - Shotgun sequencing and *In Silico* Functional Analysis of a Randomly Pooled Metagenomic Fosmid Clone from the Lowest Convective Layer of the Atlantis II Brine Pool (ATLCL) of the Red Sea Using Sanger Technology. (2012-2014)
- *Doctoral Students* at Department of Biochemistry, Faculty of Science, Ain Shams University Cairo, Egypt. **Thesis entitled:**
 - Experimental Study of the Possible Therapeutic Role of Stem Cells in Alzheimer's and Parkinson's Diseases. (2011-2014)
 - Biochemical Studies on Glucose-6-Phosphate Dehydrogenase Enzyme from Liver of Some Mammals. (2011-2015)
 - Mutation Detection in Neuronal Ceroid Lipofuscinoses 2 (NCL2) Gene in Egyptian Infants. (2012-2016)

Laboratory Course Preparation

- Development of laboratory manuals for:
 - The laboratory component of a 4th year undergraduate course **Molecular Biology and Genetic Engineering**, Ain Shams University, Cairo, Egypt.
 - The laboratory component of a 4th year undergraduate course **Molecular / Cell Biology**, The American University in Cairo, Cairo, Egypt.
 - The laboratory component of a 4th year undergraduate course **Modern Methods in Molecular Biology**, Cairo University, Giza, Egypt.

Extracurricular Teaching Activities

- 2015** Helped organize the first annual Genome Day for Buffalo Public School students, as a collaboration between the State University of New York, the City of Buffalo and the Buffalo Public Schools.
- 2011-2012** Helped to update the strategic plan for the Faculty of Science at Ain Shams University as part of the Continuous Improvement and Qualifying for Accreditation Project.
- 2011-2012** Helped set up the academic standards for the Biochemistry Program at Ain Shams University.
- 2011-2012** Actively participated in setting up the credit hour system for the Biochemistry Program at Ain Shams University.
- 2011-2012** Coordinator of the Biochemistry Program at Faculty of Science, Ain Shams University, Cairo, Egypt.
- 2010-2011** Teaching and organizing workshops on "Genomics and Proteomics", funded by the Egyptian Academy of Scientific Research and Technology, Cairo, Egypt.
- 2009-2011** Teaching and organizing multiple workshops on "Time Management", "Motivation" and "Conflict Resolution", funded by the Egyptian Academy of Scientific Research and Technology, Cairo, Egypt.
- 2010** Teaching and organizing workshops on "Lab Safety", Faculty of Science, Ain Shams University, Cairo, Egypt.
- 2003-2004** Contributed to organizing the 1st and 2nd Biochemistry Research Day at School of Medicine and Biomedical Sciences, SUNY at Buffalo, Buffalo, New York, USA.

1998-1999 Contributed to teaching and organizing the 1st and 2nd Annual workshops on "Molecular Biology and Genetic Engineering Principles and Progress", Ain Shams University Genetic Engineering Research Services Unit (ASUGEN) Faculty of Science, Ain Shams University, Cairo, Egypt.

RESEARCH

My research interests primarily lie in the fields of

- 1) Understanding the mechanism of transcription initiation in the yeast *Saccharomyces cerevisiae*;
- 2) Studying the molecular mechanism of mRNA 3' end processing, its regulation, and its interaction with other processes involved in mRNA synthesis and utilization using the model organism, *Saccharomyces cerevisiae*;
- 3) Developing new drug therapies for fungal infections by screening *Saccharomyces cerevisiae* for small-molecule inhibitors of mRNA 3' end formation by high throughput screening;
- 4) Studying the Red Sea microbial communities through metagenomic approach;
- 5) Understanding the role of *E. coli* β -Clamp DNA interaction loops in DNA replication.

Research Experience

- 2010 - 2014** **Research Associate**, Department of Biology, School of Sciences and Engineering, The American University in Cairo, Cairo, Egypt.
- 2007 - 2009** **Visiting Scientist**, The Broad Institute of Harvard and MIT, Cambridge, MA, USA.
- 2005 - 2009** **Research Associate**, Department of Molecular and Microbiology, School of Medicine, Tufts University Boston, MA, USA.
- 2001 – 2004** **Ph.D. Thesis Research Project** “Genetic and Biochemical Analysis of Yeast Transcription Factor TFIIIF” School of Medicine and Biomedical Sciences, State University of New York at Buffalo, Buffalo, NY, USA.
- 1995 - 1998** **M.Sc. Thesis Research Project** “Schistosome Gene Discovery” Faculty of Science, Ain Shams University, Cairo, Egypt.

Research and Technical Skills

- Experienced in basic and advanced molecular and cell biology techniques including FACS
- Molecular cloning and analysis
- Isolation, purification and enzymatic manipulation of DNA and RNA
- Nucleic acid and protein electrophoresis

- DNA library screening and mutagenesis
- Northern and Southern blot analysis, radioactive probe labeling, detection and primer extension analysis
- Qualitative and Quantitative PCR
- Sequencing and sequence analysis using ABI and 454 platforms
- Expression of recombinant fusion proteins; extraction, purification of native and recombinant protein using HPLC and characterization
- Immunoblotting, ELISA, CHIP, EMSA
- Yeast genetic techniques
- High throughput screening and assay development
- Water collection and isolation of microbial communities at different depth from salt water environments (Red Sea)
- Experienced in using different databases for molecular and cell biology research, including NCBI, MG-RAST and IMG.
- Proficient in using bioinformatics software for PCR analysis and primer design, alignment of nucleotide or amino acid sequence, DNA sequence assembly and analysis, gene identification and modeling structure from sequence, functional domains identification and analysis, protein gels and western blot analysis.

PUBLICATIONS

1. Nanfara, M., **Ghazy, M. A.**, Babu, V. M. P. and Sutton M.D. (2016). Genetic Screening for β -Clamp Mutants that Affects DNA Replication and TLS. (Manuscript in Preparation).
2. Soliman, B., Salem, A. M., **Ghazy, M. A.** and El-Hefnawi, M. (2016). Let-7a, MiR-34a, and MiR-199a/b: Key Player Tumor Suppressor Micro-RNA Revealing Novel Insights into Immune System Modulation and Cancer Hallmarks for Hepatocellular Carcinoma. (Manuscript in Preparation).
3. Abd El-Fatah, M. F., **Ghazy, M. A.**, Mostafa, M. S., El-Attar, M. M. and Egiza, A. O. (2015). Identification of MMP-9 as a Biomarker for Detecting Progression of Chronic Obstructive Pulmonary Disease. *Biochem Cell Biol.* 93(6):541-7, DOI: 10.1139/bcb-2015-0073. (IF 2.153)
4. Ibrahim, M. A., Ghazy, A.M., Salem, A. M., **Ghazy, M. A.** and Abdel-Monsef, M. M. (2015). Biochemical Characterization of Buffalo Liver Glucose-6-Phosphate Dehydrogenase Isoforms. *Protein J.*, 34(3): 193-204, DOI: 10.1007/s10930-015-9615-0. (IF 0.912)
5. Ibrahim, M. A., Ghazy, A.M., Salem, A. M., **Ghazy, M. A.** and Abdel-Monsef, M. M. (2014). Purification and Characterization of Glucose-6-Phosphate Dehydrogenase from Camel Liver. *Enzyme Research*, Vol. 2014, 1-10, DOI:10.1155/2014/714054.
6. Ahmed, H., Salem, A., Atta, H., **Ghazy, M. A.**, and Aglan, H. (2014). Do Adipose Tissue-Derived Mesenchymal Stem Cells Ameliorate Parkinson's Disease in Rat

Model? *Hum. Exp Toxicol.* 33(12): 1217–1231, DOI: 10.1177/0960327114524238. (IF 1.747)

7. Abdallah, R.Z., Adel, M., Ouf, A., Sayed, A., **Ghazy, M.A.**, Alam, I., Essack, M., Lafi, F., Bajic, V.B., El-Dorry, H. and Siam, R. (2014). Differential Aerobic Methanotrophs Communities in Red Sea Brine-Seawater Interfaces. *Front. Microbiol.* 5, 487, 1- 16, DOI: 10.3389/fmicb.2014.00487. (IF 3.941)
8. Salem, A., Ahmed, H., Atta, H., **Ghazy, M. A.**, and Aglan, H. (2014). Potential of Bone Marrow Mesenchymal Stem Cells in Management of Alzheimer’s Disease in Female Rats. *Cell Biol. Int.* 38 (2014): 1367–1383. (IF 1.933)
9. Ferreira, A. J. S., Siam, R., Setubal, J.C., Moustafa, A., Sayed, A., Rania Chambergo, F.S., Dawe, A.S., **Ghazy, M.A.**, Sharaf, H., Ouf, A., Alam, I., Abdel-Haleem, A.M., Lehvaslaiho, H., Ramadan, E., Antunes, A., Stingl, U., Archer, J.A.C., Jankovic, B.R., Sogin, M.L., Bajic, V.B., and El Dorry, H. (2014). Core Microbial Functional Activities in Ocean Environments Revealed by Global Metagenomic Profiling Analyses. *PLOS ONE* 9 (6): e97338. (IF 3.234)
10. Sayed, A., **Ghazy, M.A.**, Ferreira, A.J.S., Ouf, A., Adel, M., Chambergo, F.S., Dawe, A.S., Archer, J., Baijic, V.B., Siam, R. and El-Dorry, H. (2014). A Novel Mercuric Reductase from the Unique Deep Brine Environment of Atlantis II in the Red Sea. *J. Biol. Chem.* 289 (3): 1675-1687. (IF 4.573)
11. Mohamed, Y.M., **Ghazy, M.A.**, Sayed, A., Ouf, A., El-Dorry, H. and Siam, R. (2013). Isolation and Characterization of a Heavy Metal Resistant Thermophilic Esterase from the Atlantis II Red Sea Brine Pool. *Sci Rep.* 3: 3358. (IF 5.578)
12. Ezeokonkwo C., **Ghazy M.A.**, Zhelkovsky A., Yeh P., and Moore C. (2012). Interactions at the Essential N-Terminus of poly(A) Polymerase that Could Regulate Poly(A) Addition in *Saccharomyces cerevisiae*. *FEBS Letters* 568 (8): 1173-1178. (IF 3.169)
13. **Ghazy, M.A.**, Gordon J. M., Lee S.D., Singh B.N., Bohm A., Hampsey M., Moore C. (2012). The Interaction of Pcf11 and Clp1 is Needed for mRNA 3'-end Formation and is Modulated by Amino Acids in the ATP-Binding Site. *Nucleic Acids Res* 40 (3):1214-1225. (IF 9.112)
14. **Ghazy, M.A.**, and Moore, C. (2010). Identification of Small-Molecule Inhibitors of mRNA 3'-end Formation in Yeast. *Egyptian Journal of Biochemistry and Molecular Biology*.
15. Krishnamurthy, S., **Ghazy, M.A.**, and Moore, C., and Hampsey, M. (2009). Functional Interaction of the Ess1 Prolyl Isomerase with Components of the RNA Polymerase II Initiation and Termination Machineries. *Mol. Cell. Biol.* 29 (11): 2925-2934. (IF 4.777)
16. **Ghazy, M.A.**, He, X., Singh, B.N., Hampsey, M., and Moore C. (2009). The Essential

N-terminus of the Pta1 Scaffold Protein is Required for snoRNA Transcription Termination and Ssu72 Function but is Dispensable for Pre-mRNA 3'-end Processing. *Mol. Cell. Biol.* 29 (8): 2296-2307. (IF 4.777)

17. Saguez C., Schmid M., Olesen J. R., **Ghazy, M.A.**, Poulsen M. B., Nasser T., Moore C., and Jensen T. H. (2008). Nuclear mRNA Surveillance in THO/sub2 Mutants is Triggered by Inefficient Polyadenylation. *Mol. Cell* 31(1): 91–103. (IF 14.018)
18. Majovski, R.C., Khapersky, D.A., **Ghazy, M.A.**, and Ponticelli, A.S. (2005). A Functional Role for the Switch 2 Region of Yeast RNAPII in Transcription Start Site Utilization and Abortive Initiation. *J. Biol. Chem.* 280(41): 34917-23. (IF 4.573)
19. **Ghazy, M.A.**, Brodie, S.A., Ammerman, M.L., Ziegler, L.M. and Ponticelli, A.S. (2004). Amino Acid Substitutions in Yeast TFIIF Confer Upstream Shifts in Transcription Initiation and Altered Interaction with RNA Polymerase II. *Mol. Cell. Biol.* 24: 10975-85. (IF 4.777)
20. Pardee, T.S., **Ghazy, M.A.**, and Ponticelli, A.S. (2003). Yeast and Human RNA Polymerase II Elongation Complexes: Evidence for Functional Differences and Postinitiation Recruitment of Factors. *Eukaryotic Cell.* 2: 318-327. (IF 3.586)

SCIENTIFIC TALKS

1. Isolation and Characterization of Novel Biotechnologically Important Proteins from the Microbial Community of the Red Sea Atlantis-II Brine Pool

The 11th National Conference of Biochemistry and Molecular Biology & Their Role in Development and Environment, March 30- April 1/ 2014, Cairo, Egypt.

2. Screening *Saccharomyces cerevisiae* for Small Molecule Inhibitors of mRNA 3'-end Formation

The 9th National Conference of Biochemistry and Molecular Biology & Their Role in Development and Environment, March 4-6/ 2012, Cairo, Egypt.

3. The N-Terminus of the Pta1 Scaffold Protein is Required for snoRNA Transcription Termination and Gene-Looping but Dispensable for pre-mRNA 3'-end Processing

The New England RNA Club Meeting, November 19/ 2008, Harvard University, Boston, MA, USA.

4. Structure-Function Studies of the *S. cerevisiae* TFIIF Large Subunit TFG1

The 2nd Biochemistry Research Day, April 30/ 2004, School of Medicine and Biomedical Sciences, SUNY at Buffalo, Buffalo, NY, USA.

5. Schistosome Gene Discovery by the EST Approach

The 3rd Arab Conference on Modern Biotechnology and Areas of Application in the Arab World, December 14-17/ 1998, Cairo, Egypt and the International Conference on Schistosomiasis, March 15-19/ 1998, Cairo, Egypt.

POSTER PRESENTATIONS

1. Understanding the Role of β -Clamp-DNA Interaction Loops in Replication and TLS

The 7th Annual Postdoc Research Symposium, University at Buffalo, June 5/2015, Buffalo, NY, USA.

2. Identification of a Multicopper Oxidase from the Microbial Community of the Red Sea Atlantis-II Brine Pool

The 9th Annual Department of Energy JGI User Meeting, March 18-20/ 2014, Walnut Creek, CA, USA.

3. A Metagenomic Approach for Identification of Novel Enzymes from the Red Sea Atlantis II Brine Pool

The 8th Annual Department of Energy JGI User Meeting, March 25-28/ 2013, Walnut Creek, CA, USA.

4. Identification of Potential Serine Proteases from the Microbial Community of the Red Sea Atlantis-II Brine Pool Using a Metagenomic Approach

The 7th Annual Department of Energy JGI User Meeting, March 19-23/ 2012, Walnut Creek, CA, USA.

5. Construction and Analysis of Metagenomic Fosmid Library from the Red Sea's Atlantis II Hot Deep-Sea Brine

The 6th Annual Department of Energy JGI User Meeting, March 21-25/ 2011, Walnut Creek, CA, USA.

6. The N-Terminus of the Pta1 Scaffold Protein is Required for snoRNA Transcription Termination and Gene-Looping but Dispensable for pre-mRNA 3'-end Processing

The Post-Initiation Activities of RNA Polymerases Conference, November 6-9/ 2008, Mountain Lake, VA, USA.

7. Identification of Small-Molecule Inhibitors of mRNA 3'-end Formation in Yeast

The Geographic Medicine and Infectious Diseases Research Day, November 4/ 2008, School of Medicine, Tufts University, Boston, MA, USA.

8. Functional Characterization of the Cleavage and Polyadenylation Factor Pta1

The Eukaryotic mRNA Processing Conference, August 22-26/ 2007, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY, USA.

9. Genetic and Biochemical Analysis of the Yeast General Transcription Factor IIF

Mechanism of Eukaryotic Transcription Conference, August 27-31/ 2003, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY, USA.

PROFESSIONAL DEVELOPMENT

- 2014** Certificate in "Foundation of Business Administration", School of Continuing Education, The American University in Cairo, Cairo, Egypt.
- 2013** Workshop on "KBase Outreach Workshop", the 8th Annual Department of Energy JGI User Meeting, Walnut Creek, CA, USA.
- 2012** Workshops on "IMG and IMG metagenomes", the 7th Annual Department of Energy JGI User Meeting, Walnut Creek, CA, USA.
- 2011** Workshops on "IMG and IMG metagenomes", the 6th Annual Department of Energy JGI User Meeting, Walnut Creek, CA, USA.
- 2009** Workshop on "Partnering for Effective Performance Plans", Tufts University School of Medicine, Boston, MA.
- 2009** Course on "Responsible Conduct of Research", Tufts University School of Medicine, Boston, MA.
- 2009** Grant writing workshop on "What Makes a Good Proposal", Tufts University School of Medicine, Boston, MA.
- 2007** Workshop on "Lab Dynamics: Managing Difficult People and Difficult Situations", Tufts University School of Medicine, Boston, MA.
- 2007** Workshop on "Entering Mentoring", Tufts University School of Medicine, Boston, MA.

AWARDS AND HONORS

- 2010** Egyptian State Award in Biological Sciences from the Egyptian Academy of Scientific Research and Technology.
- 2008** NIH-funded HIV Pathogenesis Training Grant Program, Tufts University.
- 2005** Biochemistry Dissertation Research Recognition Award for Ph.D. Dissertation, School of Medicine and Biomedical Sciences, SUNY at Buffalo, Buffalo, NY, USA.
- 2004** Best Oral Presentation Award at the 2nd Biochemistry Research day for talk entitled "Structure-Function Studies of the *S. cerevisiae* TFIIF Large Subunit TFG1", School of Medicine and Biomedical Sciences, SUNY at Buffalo, Buffalo, NY, USA.

PROFESSIONAL SOCIETIES

Present Member of the RNA Society, American Society of Microbiology, Egyptian Society for Biochemistry and Molecular Biology, Egyptian Society for Immunology.