Elizabeth A. Caselle, Ph.D.

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PROFESSIONAL SUMMARY

Scientist with eight years of experience on protein engineering and improving knowledge of protein function. Background in applying innovative approaches to engineering proteins to catalyze chemical reactions, advancing environmentally friendly chemistry. Designed novel assays towards inhibiting bacteria cell division, by targeting bacterial cell division proteins. Greatest achievements extend beyond my own discoveries, through training of others and benefitting the scientific community at large.

EXPERIENCE

Research

-No high-throughput method had been developed to study the formation of a protein complex required for bacterial cell division (FtsBLQ). Developed and optimized a fluorescence polarization assay used to screen for small molecule inhibitors of FtsBLQ protein-protein interactions and find potential antibacterial candidates.

-More effective economical and environmentally friendly methods are needed to produce everyday chemical products. Designed proteins to catalyze several useful enzymatic reactions in a more cost effective, "green" way, with the highest rates of reactivities at time of design. This also led to greater understanding of enzymatic activity.

-Lack of understanding on the mechanisms of how drugs act on proteins impedes discovery of new drugs. Determined the preferred mechanism of action of a chelator drug on an iron binding protein. This information can be used to design improved iron chelator drugs.

Scientific

Proficient in numerous biophysical characterization techniques including HPLC, ITC, mass spectrometry, UV-Vis, Bio-Layer Interferometry/SPR, confocal microscopy, fluorescence and fluorescence polarization, *in vitro* enzymatic assays and AlphaLisa (luminescence assay). Familiar with peptide synthesis, protein expression and purification, PCR, cloning, and nucleic acid purification.

Communication

-Published articles, communications and reviews in peer-reviewed scientific journals.

-Presented research at major scientific conferences and in university seminars.

-Led several courses, including Biochemistry Laboratory seminar class at University of Wisconsin-Madison as an instructor, and a variety of courses at Syracuse University and Wells College as a teaching assistant.

Collaboration

Worked in partnership with teams both internally and externally.

-Collaborated with staff at the Small Molecule Screening Facility at U.W. Carbone Cancer Center Drug Development Core to attain antibacterial candidates.
-Partnered with Biophysical Instrumentation Facility staff at University of Wisconsin-Madison to design experiments to elucidate protein function.
-Worked together within own research labs with several postdocs, graduate students and undergraduate students to design enzymes and better understand protein function.
-Assisted researchers from Markley Lab at University of Wisconsin-Madison in obtaining structural information on protein systems.

Leadership

-Taught and trained 10 undergraduate and graduate students.

-Resolved unsafe practices through improving storage and operating protocols in current position. This decreased the overall need for safety improvements in annual safety inspection.

-Updated out of date biosafety protocol which assisted current lab in maintaining compliance with regulatory funding agencies.

-Maintained laboratory reagent and equipment inventories, ensuring efficient lab operations.

SELECTED PUBLICATIONS AND PRESENTATIONS*

Raymond, E. A., Mack, K. L., Yoon, J. H., Moroz, O. V., Moroz, Y. S., Korendovych, I. V. Design of an Allosterically Regulated Retroaldolase. *Protein Science*, (2015), 24, 561-570.

Makhlynets, O. V., **Raymond, E. A.**, Korendovych, I.V. Design of allosterically regulated protein catalysts. *Biochemistry*, (2015), 54, 1444-1456.

Moroz, O. V., Moroz, Y. S., Wu, Y., Olsen, A. B., Cheng, H., Mack, K. L., McLaughlin, J. M., **Raymond, E. A.**, Zhezherya, K., Roder, H., Korendovych, I. V., A Single Mutation in a Regulatory Protein Produces Evolvable Allosterically Regulated Catalyst of Nonnatural Reaction. *Angewandte Chemie International Edition,* **(2013)**, 52, 6246 –6249.

Molecular Genetics of Bacteria and Phages Meeting. Madison, WI (August 2018)
"Structural Analysis of Bacterial Cell Division Proteins FtsB and FtsQ"

Biophysical Society Meeting. New Orleans, LA (February 2017)
"Assessment of Protein-Protein Interactions in FtsBLQ Complex using fluorescence *in vitro*"

S.U.N.Y. Buffalo State, Science Colloquium. Buffalo, NY (April 2015)
"Design of Catalytic Function in Proteins"

Protein Engineering Canada Conference. Ottawa, ON (June 2014)
"Introducing New Functions into Old Proteins"

*Last named changed to Caselle from Raymond in 2015

EDUCATION AND TRAINING

University of Wisconsin-Madison, Madison, WI

Postdoctoral Research**,** Biochemistry, **February 2016 - present**

Syracuse University, Syracuse, NY
Ph.D., Chemistry with a focus in Biochemistry, **May 2016**

Wells College, Aurora, NY
B.A., Biochemistry, **May 2011**

REFERENCES

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