Caitlin Kramer

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Education

- **Northeastern University** **Boston, MA**
  College of Science, B.S./M.S. Chemistry *2011 - 2016*

Experience

- **DNA Damage Recognition and Tolerance Laboratory** **Northeastern University**
  Undegraduate Researcher turned MS Student *May 2012 – Present*
  - Led research on the uncharacterized *E. coli* DNA damage response gene *ybfeE*. Developed the protocols necessary for the expression and purification of the protein, and confirmed a computation prediction of DNA binding using *in vitro* methods. Structurally characterized the protein using site-directed mutagenesis, circular dichroism, and molecular modeling (YASARA). Conducted *in vivo* assays to characterize the gene's role in regulation of the DNA damage response, mutagenicity, and stress response.
  - Investigated the putative Y-family DNA polymerase DinB from *S. meliloti* through expression in *E. coli*. Cloned gene into pET expression vector and developed expression and purification methods to troubleshoot problems with protein solubility and acquire viable protein for characterization. Assayed protein activity by primer extension assays.
  - Prepared damaged DNA samples for LC-MS characterization of adducts caused by *in vivo* vs. *in vitro* by nitrofurazone and benzyl bromide.
  - Mentored and trained undergraduate students in the lab.
- **InfoCommons Service Desk** **Northeastern University**
  Student Staff *September 2011 – Present*
  - Assist customers in person and on the phone with addressing computer problems on personal and lab computers.
  - Keep printers and lab computers in working order.
  - Communicate with managers to provide the most up-to-date information to customers and other staff.
- **GlaxoSmithKline** **Boston MDR**
  Library Chemistry Co-op *January 2013 – June 2013*
  - Participated in development work, production, and quality control of a 49 million member purine-scaffold library using ELT (Encoded Library Technology).
  - Ensured general reaction scheme was valid prior to library production.
  - Checked that litigation of DNA tags was not impeded by other reactants.
  - Determined the scope of reactive chemical building blocks to be used in production.

Skills and Qualifications

Chemical biology: PCR amplification and site-directed mutagenesis, molecular cloning, gel electrophoresis, Western Blot, protein expression (including pET system) and purification (AKTA Prime FPLC), primer extension (^{32}P), differential scanning fluorimetry, DNA purification, cell culture, sterile technique, bacterial transformation

Analytical: Circular dichroism, NMR, LC-MS, HPL, UV/Vis, IR, TLC

Organic: Crystallization, separation, extraction, distillation, TLC, anhydrous technique, synthesis, purification, characterization

Computer: Linux, PC, Mac, Office suite, SQL, Racket, Python, emacs, tmux, Pymol, YASARA

Conferences and Presentations

- Matz Research Symposium • 2015. Given to Northeastern alumni, faculty and students.
- ASBMB • 2015 Annual Meeting • Boston. Presented poster: "Expression and purification of putative Y-family polymerase DinB from *Sinorhizobium meliloti*"
- ASBMB • 2016 Annual Meeting • San Diego. Presenting poster: "Characterization of the *E. coli* SOS response protein YbfE"

Awards

- Matz Research Scholarship • 2014. Competitive grant given to undergraduates used to fun 6 month full-time research co-op.
- Provost Thesis Grant • 2015 Funding awarded selectively to graduate students based on written proposals.

Affiliations

- American Chemical Society, since 2015
- American Society for Biochmeistry and Molecular Biology, since 2015.