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**
  MS Student, previously Undergraduate Researcher *May 2012 – Present*
  Supervised by Dr. Penny Beuning
  - Developed protocols for expression and purification of multiple proteins.
  - Led research on the uncharacterized *E. coli* DNA damage response gene *ybfE* and confirmed a computational prediction of DNA binding using *in vitro* methods. Structurally characterized the protein using site-directed mutagenesis, circular dichroism, and molecular modeling. Conducted *in vivo* assays to elucidate the gene's functional role.
  - Investigated the putative Y-family DNA polymerase DinB from plant symbiont *Sinorhizobium meliloti*. Cloned gene into pET expression vector. Troubleshot problems with protein solubility to acquire viable protein for characterization. Assayed protein activity by primer extension.
  - Designed experimental protocols for damaging DNA *in vivo* and *in vitro* with nitrofurazone and benzyl bromide. Prepared samples for LC-MS characterization of resulting adducts.
  - Mentored and trained undergraduate students in the lab.
- **GlaxoSmithKline** **Boston MDR**
  Library Chemistry Co-op *January 2013 – June 2013*
  Supervised by Dr. Josephine Yuen
  - 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 ligation of DNA tags was not impeded by other reactants.
  - Determined the scope of reactive chemical building blocks to be used in production.
- **InfoCommons Service Desk** **Northeastern University**
  Student Staff *September 2011 – Present*
  Supervised by Mike Horgan
  - Assisted customers in person and on the phone with addressing computer problems on personal and lab computers.
  - Kept printers and lab computers in working order.
  - Communicated with managers to provide the most up-to-date information to customers and other staff.

Skills and Qualifications

- **Chemical biology:** PCR, site-directed mutagenesis, molecular cloning, gel electrophoresis, Western Blot, protein expression (including pET system) and purification (AKTA), primer extension (^{32}P), differential scanning fluorimetry, DNA purification, cell culture, sterile technique, bacterial transformation, sequencing data analysis
- **Analytical:** Circular dichroism, NMR (Varian), LC-MS, HPLC, UV/Vis, IR, TLC, data analysis
- **Organic:** Crystallization, separation, extraction, distillation, TLC, anhydrous technique, purification, characterization, library constuction, quality control
- **Computer:** Linux, PC, Mac, Office suite, SQL, Racket, Python, emacs, LaTeX, Pymol, YASARA, Entrez Direct, EndNote

Conferences and Presentations

- Matz Research Symposium 2015 ◇ 20 minute oral presentation 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 fund 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 Biochemistry and Molecular Biology, since 2015.