Abstract

β-lactamases are bacterial enzymes that confer resistance to β-lactam antibiotics, such as penicillins and cephalosporins, and are contributing to an antibiotic resistance pandemic. There are four classes of β-lactamases, each with characteristic sequence and structure properties. Class A and B are the most common and have been well characterized, however, less is known about the C and D enzymes. This project is a continuation of prior work, in which the thermodynamic and mechanical properties of four class-C AmpC β-lactamase enzymes were characterized. While quantitative descriptions of enzyme dynamics are useful, a complete understanding of how these enzymes function require knowledge of additional physical properties. Using computational methods, various properties of the four class-C AmpC β-lactamase enzymes will be characterized. Then, the properties will be compared to determine how parallel the various physical properties are across the AmpC family.