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**Biophysical Characterization of Collagenase S1 Domain.** C.R. Sides, S.T. Leena, Philominathan, O. Matsushita, J.J. Sakon, Univ. of Arkansas, Fayetteville, AR 72701 USA.

Previous ColH collagenase studies from *Clostridium histolyticum* propose that the catalytic domain of the protein is the S1 domain. Studying the active site architecture for this novel class of zinc proteases is important for understanding the mechanism of collagenase and as a target for drug development for gas gangrene or wound healing. No homologous structure to collagenase S1 domain is known; therefore, biophysical characterization experiments are beneficial to learning the basic physical properties, such as folding and binding, which provide insight to S1 crystallization. Properties of S1 domains from five different *Clostridium* species have been analyzed both in the presence and absence of calcium because calcium is thought to activate collagenase. Circular dichroism and dynamic light scattering showed that although calcium is important in the dynamics of the enzyme, no secondary structural change accompanies calcium addition. Furthermore, isothermal calorimetry binding curves showed little indication for calcium binding to the S1 domain, thus suggesting that although calcium is useful in crystallization, calcium only plays a significant role in collagenase S3 domains and not in the S1 domain.