The Ensemble of TELSAM Crystallization Behaviors

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TELSAM polymers are polymer-forming protein crystallization chaperones that help in simplifying protein crystallization and structure determination. In this study, we show TELSAM's ability to crystallize without forming a polymer and to form compressed single and double helical polymers. We have observed that compressed single or double TELSAM polymers are only formed if the target protein is cleaved. We propose a model for how to target protein cleavage may enable double-helical polymers and/or polymer compression. We report new minimum helical rises for single and double helical polymers. In addition, we present here the variable binding modes, helical rises, and helical packing of a TELSAM-TNK1-UBA construct. These structures allow us to propose a mechanism for TELSAM-target protein crystal nucleation and the role of linker length and composition. We conclude that the TELSAM polymer is a powerful crystallization chaperone meriting further investigation.