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**Investigations of the Stabilizing Osmolyte, TMAO, as a New Precipitant for Protein Crystallization** HALEY MARSHALL, MURUGAPPAN VENKAT, DOUGLAS JUERS, Department of Physics, Whitman College — Osmolytes, organic compounds used by organisms to maintain osmotic balance, are known to modulate the solution behavior of proteins, in some cases increasing stability. Due to the nature of protein crystallization and the need for stable proteins to produce crystals, osmolytes could prove to be useful agents for crystallization. In this study, we demonstrate the potential of trimethylamine N-oxide (TMAO), a common osmolyte, as a crystallization agent. TMAO was successfully used to grow a total of eight different crystal forms of five different proteins. Furthermore, the crystals produced with TMAO as the crystallization agent were comparable in quality, morphology and their ability to diffract X-rays to crystals grown with previously identified crystallization conditions. We therefore expect the efficacy of TMAO as a crystallization agent will extend to other proteins systems and suggest that, due to its stabilizing effect on protein structure, TMAO may be a good alternative screening agent for protein crystal growth.

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