

Investigating the SARS-CoV-2 ORF 8 Accessory Protein: Expression,
Purification, and Structural Determination

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Abstract

In order to provide insight into potential therapeutic breakthroughs for the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), more research must be done to understand the structure and function of its proteins. The open reading frame 8 (ORF 8) accessory protein is particularly unstable on its own outside of the viral envelope but can be stabilized when bound to the small ubiquitin-related modifier (SUMO) protein. The stable ORF 8-SUMO protein complex can be expressed and purified using familiar techniques and later characterized with nuclear magnetic resonance (NMR) spectroscopy, thus allowing us to gain knowledge about the role it plays in viral invasion. Our research this year focused on optimizing the purification process to begin more informative studies in later semesters. We have been successful in expressing the ORF 8 protein and purifying it in its denatured, SUMO-tagged form. Future aims include cold-buffer refolding and subsequent SUMO-tag cleavage, or possibly performing NMR studies with the SUMO-tag still present.

Keywords:

SARS-CoV-2; Coronavirus; ORF 8 Accessory Protein; SUMO Chaperone Protein.