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# Initialization of Structural Proteomic Studies of the Giant Marine Virus CroV

Duer Bolotaulo<sup>^</sup>

*University of Texas at El Paso*, [dbolotaulo@miners.utep.edu](mailto:dbolotaulo@miners.utep.edu)

Nancy Rondeau

*University of Texas at El Paso*, [nulloa2@miners.utep.edu](mailto:nulloa2@miners.utep.edu)

Gustavo A. Avila

*University of Texas at El Paso*, [gaavila@miners.utep.edu](mailto:gaavila@miners.utep.edu)

Matthias G. Fischer

*University of British Columbia*, [mfischer@eos.ubc.ca](mailto:mfischer@eos.ubc.ca)

Curtis A. Suttle

*University of British Columbia*, [csuttle@eos.ubc.ca](mailto:csuttle@eos.ubc.ca)

*See next page for additional authors*

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**Author or Authors**

Duer Bolotaulo<sup>^</sup>, Nancy Rondeau, Gustavo A. Avila, Matthias G. Fischer, Curtis A. Suttle, and Chuan Xiao\*

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Duer Bolotaulo<sup>^</sup>, Nancy Rondeau, Gustavo A. Avila, Matthias G. Fischer,  
Curtis A. Suttle, and Chuan Xiao\*

*Department of Chemistry, University of Texas at El Paso and  
Department of Microbiology and Immunology, University of British Columbia*

The existence of cellular genes in viruses such as the nucleocytoplasmic large DNA viruses (NCLDV) has led to not only the redefinition of the virus but also the mystery of the origin of these genes. *Cafeteria roenbergensis* virus (CroV) is a giant marine virus in the NCLDV clade. Information obtained from structural proteomics studies of CroV can be compared with known cellular counterparts, elucidating the evolutionary relationship between virus and cell in a three-dimensional structural aspect. CroV's major capsid protein gene (MCP) and five CroV genes, (CDS 84, 115, 143, 149, 152) including a photolyase and an oxidoreductase, have been chosen to be cloned, expressed, and crystallized to determine their atomic structures. Cloning will be accomplished using Invitrogen's Gateway System, which confers the advantage of accessibility to different expression systems. Proteins will be purified to high homogeneity via affinity chromatography for screening of crystallization conditions. Atomic structures will be determined through x-ray crystallography. CroV genes 84, 115, 143, 149, and 152 are in the cloning phase and the MCP gene is in protein expression trials. Comparisons to homologous proteins, functional analyses, and mutagenesis studies will follow to extend the proteomics study of CroV.