

Department of Molecular and Cellular Biology
Graduate Seminar MCB*7500
Friday, Feb. 9, 2018 in SSC 1511 @ 12:45 p.m.

presented by:

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(Advisor: B. Meng)

“Functional characterization of novel viral AlkB domain of *Grapevine leafroll-associated virus 3*”

Grapevine leafroll-associated virus (GLRaV-3) (genus *Ampelovirus*, family *Closteroviridae*) is one of the most destructive grapevine-infecting viruses with a worldwide distribution, which severely reduces the yield and quality of the grapes and the wine products. It is graft-transmissible and also transmitted by mealybugs and soft scale insects in a semi-persistent manner. It has one of the largest genomes of all RNA viruses known to date, and contains 12 open reading frames. GLRaV-3 encodes an alkylation B (AlkB) domain, which is the unique feature of a subset of viruses. The purpose of this research is to conduct functional characterization of viral AlkB to determine its potential involvement in the repair of deleterious methylation damage caused by woody perennials. Mutant constructs of GLRaV-3 AlkB will be generated on an infectious clone of GLRaV-3 available in our lab. These constructs will be agroinfiltrated into experimental host *Nicotiana benthamiana* and natural host grapevine to study the role of AlkB in genome replication and gene expression of GLRaV-3 through a number of assays. Additionally, the crystal structure of GLRaV-3 AlkB will be determined. By the end of this research, the importance of AlkB domain for the adaptability GLRaV-3 and other AlkB-containing viruses in its woody perennial host will be revealed. The elucidation of molecular mechanism that govern infection and replication of GLRaV-3 and related viruses will help in the future to develop an effective control measure against this devastating virus in order to promote grape and wine production.