

グローバルイノベーション研究院 公開セミナー Institute of Global Innovation Research Open Seminar

September 3, Tue, 14:00 - 16:50

東京農工大学 府中キャンパス 50周年記念ホール
Memorial Hall (Alumni 50th Anniversary Hall), Fuchu Campus, TUAT

14:00 - 15:20

Biological Control for Grapevine Crown Gall by Nonpathogenic *Rhizobium* (=Agrobacterium) vitis Strain ARK-1



Dr. Akira Kawaguchi National Agriculture and Food Research Organization (NARO), Japan
Crown gall of grapevine, which is caused by tumorigenic *Rhizobium* (=Agrobacterium) vitis, is the most important bacterial disease of grapevine throughout the world. Screening tests of biological control agent resulted in a discovery of a nonpathogenic *R. vitis* strain ARK-1. By soaking grapevine roots with a cell suspension of the strain ARK-1 prior to planting in the field, ARK-1 treatment significantly reduced the number of plants with crown gall symptoms. Several field trials results indicated that ARK-1 was very effective in the fields, not only for grapevine but also for diverse plant species, such as apple, Japanese pear, and peach. In experiments where a mixture of ARK-1 and the tumorigenic strain at a 1:1 cell ratio was examined in vitro and in planta, expressions of the virulence genes *virD2* and *virE2* of the tumorigenic strain were significantly lower. The suppression of virulence genes, which can result in a reduction of gall formation and the pathogen population, seems to be a unique mechanism of ARK-1. These results indicate that ARK-1 is a promising new agent to control grapevine crown gall.

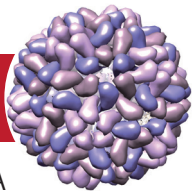
スライド / 英語, 講演 / 日本語, Slides / English, Talk / Japanese

15:20 - 15:30

休憩 / Break

15:30 - 16:50

Viruses as Tools for Basic and Applied Plant Research



Dr. Richard S. Nelson Oklahoma State University / Noble Research Institute, LLC, USA
Plant viruses, as obligate parasites, must use host components to replicate and spread. Therefore, through their study plant biologists and virologists can understand virus replication, the virus' s effect on normal plant metabolism and the potential of this information for use in applied studies. Research in my laboratory has been directed toward understanding how viruses replicate and move within cells and to utilize viruses as vehicles to study plant gene function through virus-induced gene silencing. Regarding the first objective, through pharmacological inhibitor studies and other methods we determined that plant actin and myosin are important for virus spread, including that of Tobacco mosaic virus (TMV). TMV is a model single-stranded RNA virus used for virus-plant interaction studies. Through a yeast two hybrid screen we also identified host proteins that interact with the 126 kDa protein of TMV, a protein required for normal virus accumulation and intercellular spread. As an example, we identified a host SNARE protein, normally required for intracellular membrane fusions, that interacts with the 126 kDa protein and is necessary for normal virus accumulation. The study of these interactions provides needed knowledge of which host proteins may be targets for silencing or overexpression to prevent virus infection. Regarding the second objective, viruses may be used to silence host gene expression through VIGS to determine the host gene function in plant development. I will describe the development and improvement of Brome mosaic virus as a vector for virus induced-gene silencing studies in grasses. I will also describe the use of this vector in a program where approximately 90 host genes were expressed in foxtail millet, a model for the biofuel plant, switchgrass, to identify genes that can affect biofuel production traits of these grasses.

言語 / 英語, Language/English

■共催 / Co-organized by
グローバルイノベーション研究院
Institute of Global Innovation Research
卓越大学院プログラム
Excellent Leader Development for Super Smart Society
by New Industry Creation and Diversity
遺伝子実験施設 Gene Research Center

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どなたでも、ご聴講いただけます。
Everyone is welcome to attend.

Images: Wikipedia (ブドウ, Brome mosaic virus)