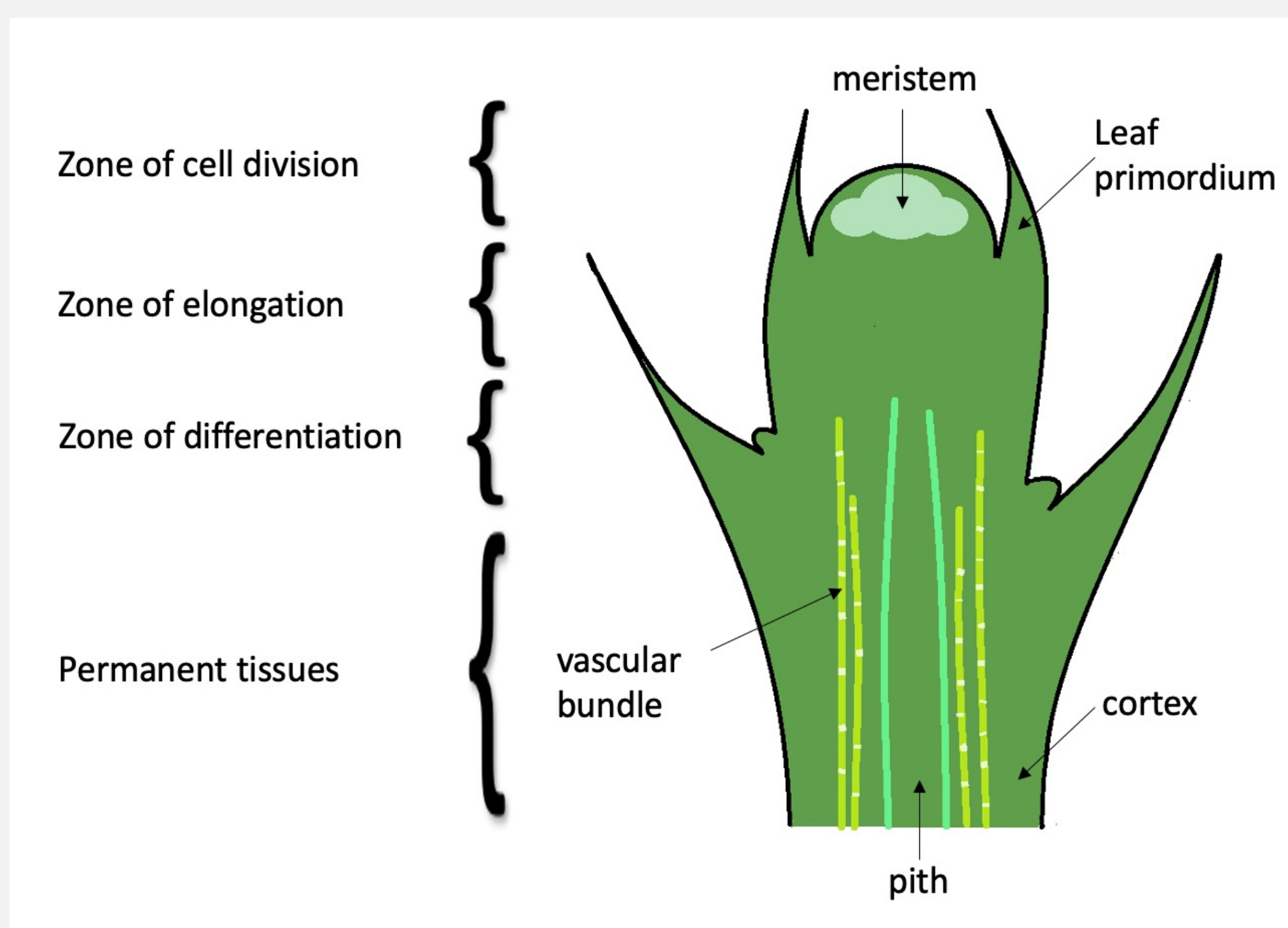


Why is it important to generate virus-free grapevine planting material through micro-propagation?

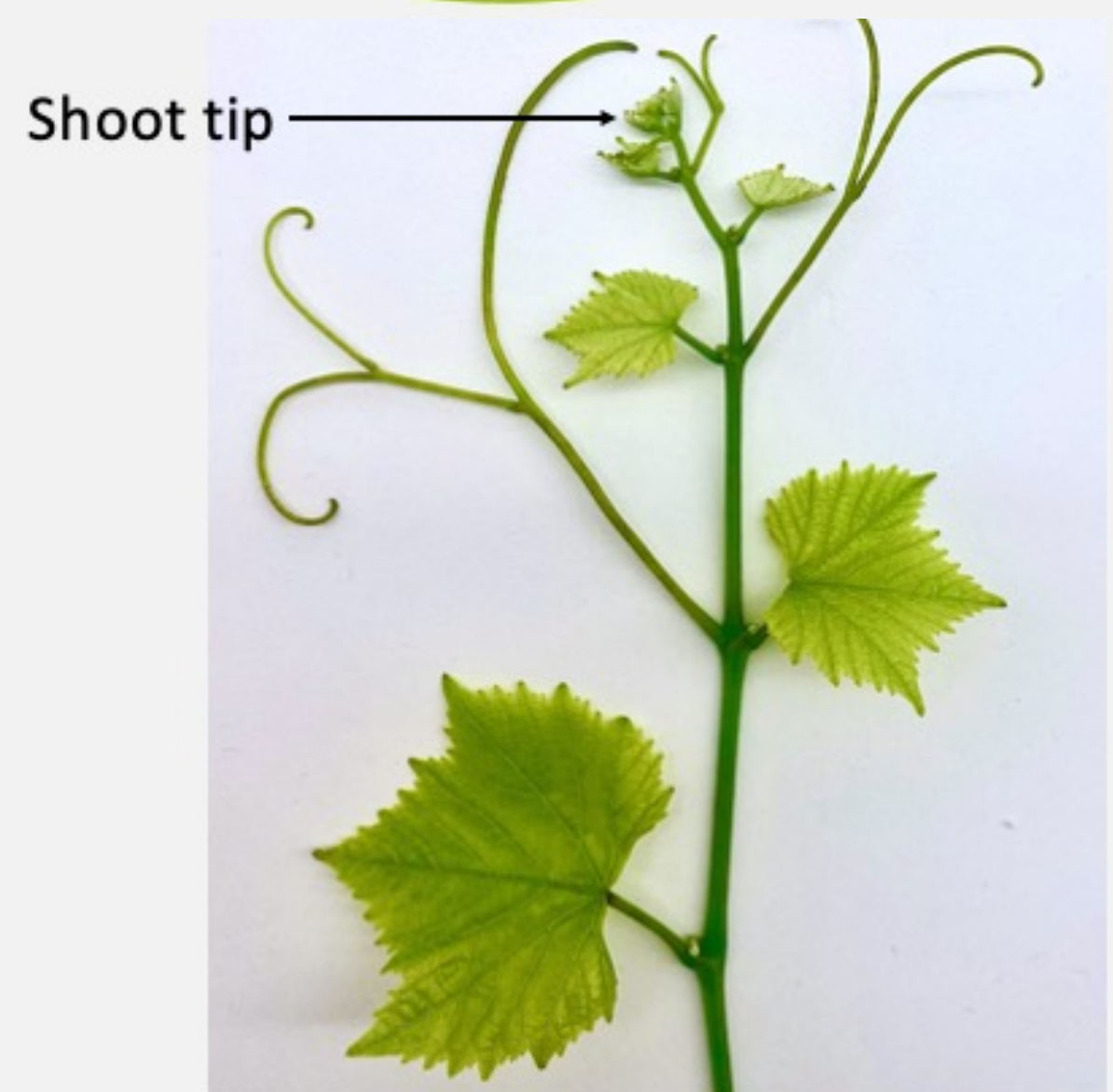
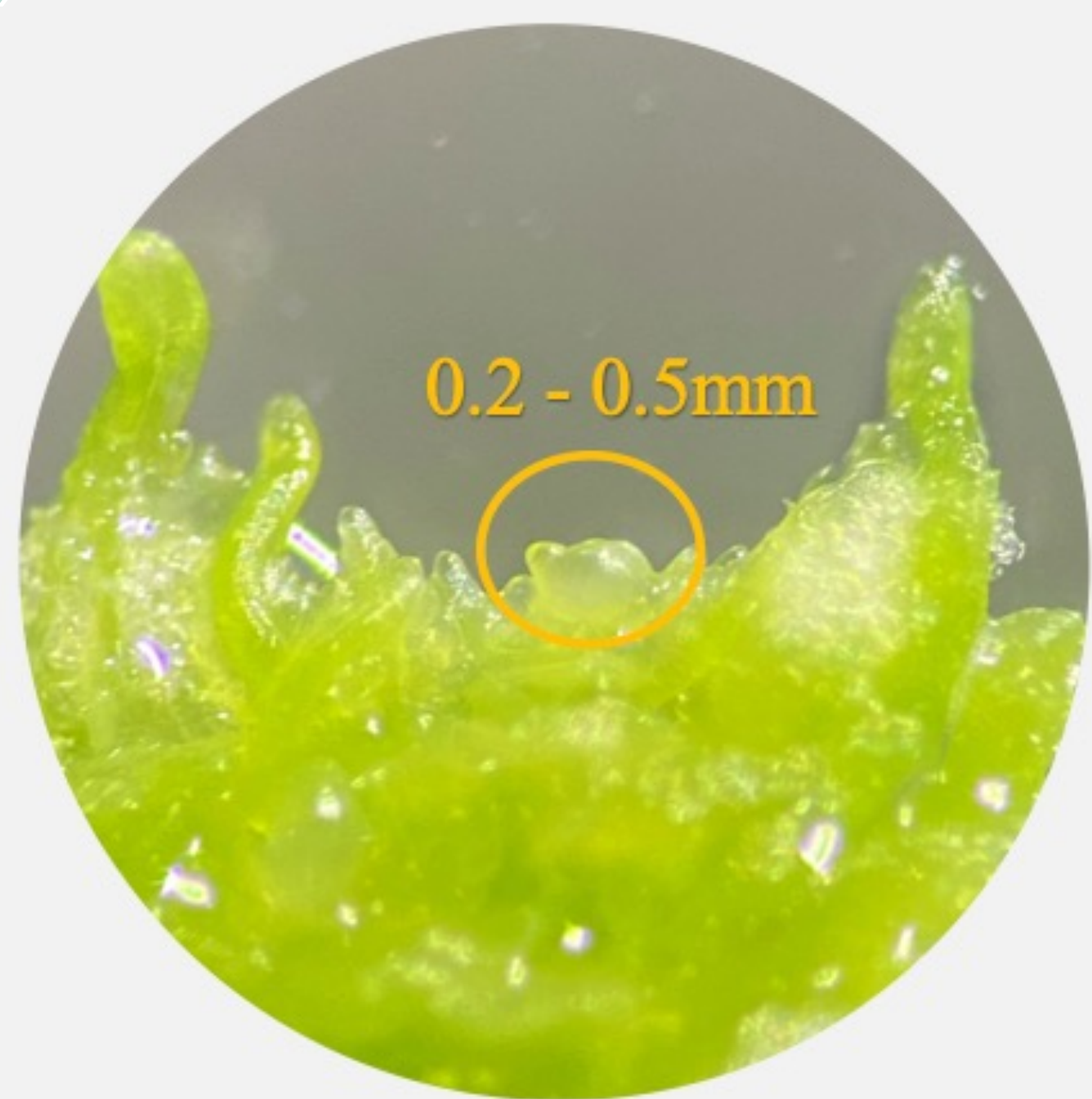
- Grapevine viruses negatively impact vine growth and wine quality and is a growing concern for sustainability of grape and wine sector.
- Access to virus-free grape materials that are both popular and of regional importance, is critical for Canadian grape and wine sector.
- Development of the micro-propagation protocols in the grapevine clean plant program involve the elimination of viruses from the candidate material using meristem-tip tissue culture.
- Developing micro-propagation protocols would accelerate the production of virus-free grapevine planting material and create opportunities in domestic and global trading for Canada, benefiting growers, nursery owners, custom propagators, and academic researchers in viticultural and breeding programs.

Why could meristem tissue culture eliminate viruses in plants?



- Two ways** of virus movement in plants:
Through the vascular bundle. Meristem tip has no structural vascular bundle;
Through plasmodesmata. Virus movement speed is very slow in plasmodesmata. Virus can not catch up with the speed of cell division in the meristem tip.
- Thus, the distribution of viruses in plants is uneven. Apical meristem tissues in infected plants usually contain no or very low concentrations of viruses, whereas tissues far down from the meristem tip may contain higher amounts of viruses.
- Meristem tip tissue culture is a promising technology for generating virus-free vines.

Meristem tissue culture

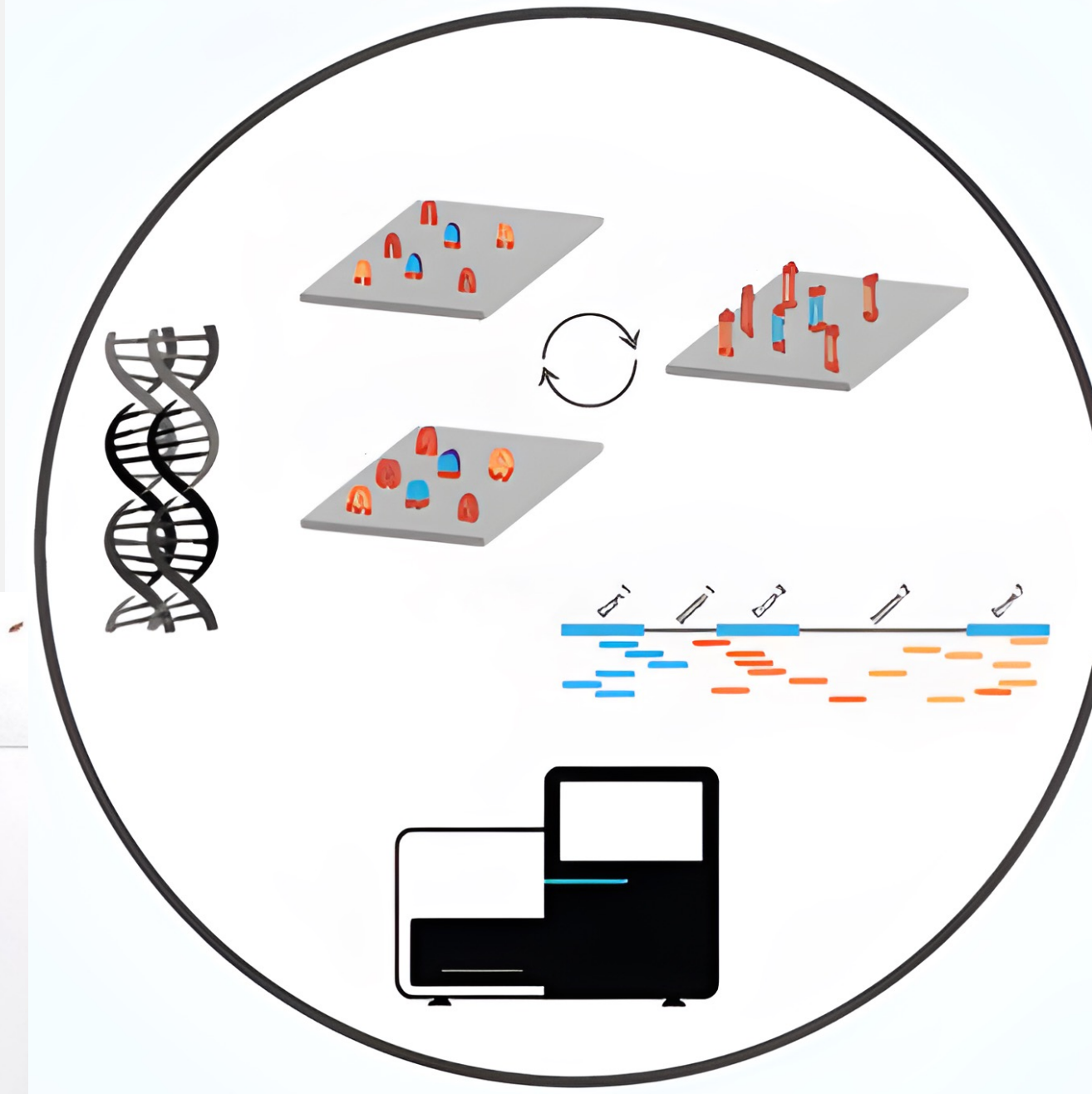


- 0.2-0.5 mm size meristem tips are cut from shoot tips under 100X microscope



Growing meristems in tube and culture vessels

High Throughput Sequencing



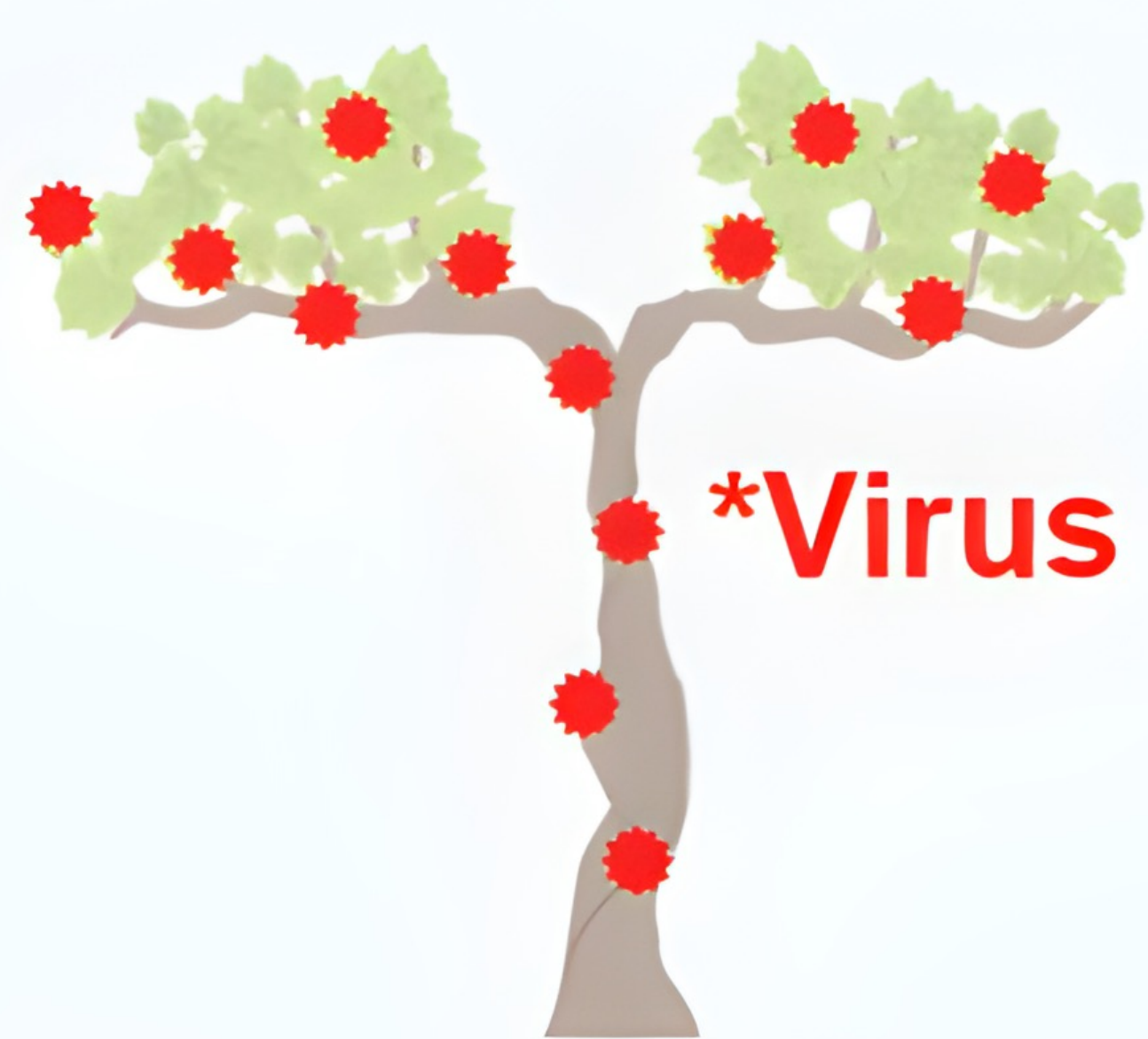
- If HTS results show negative, vine introduced into the repository



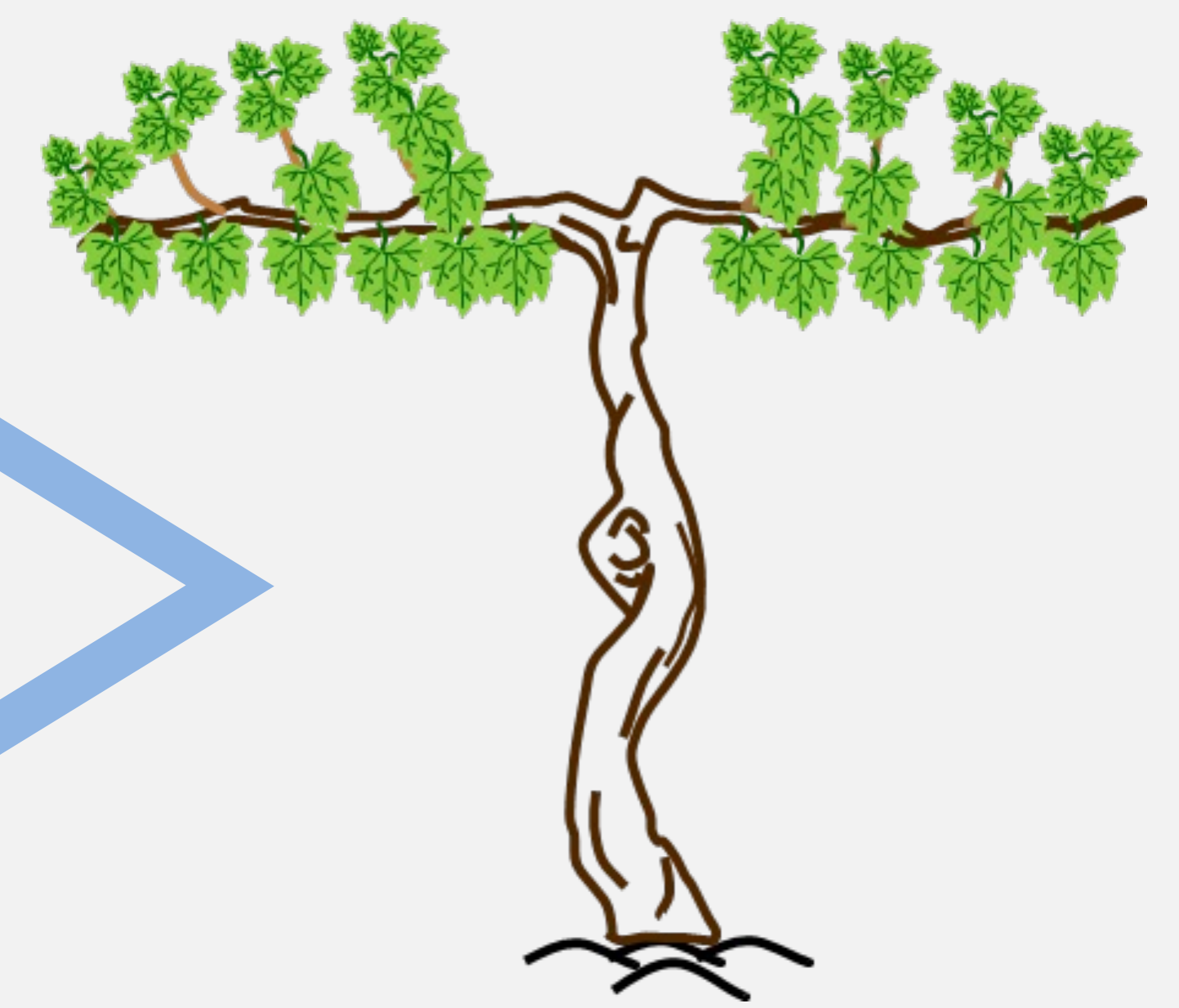
Propagate in greenhouse

- Propagate in the lab under controlled conditions

Clean Plant Program: Virus Elimination



Virus infected grapevine



Virus free, healthy, true-to-type grapevine