Vitis aestivalis-derived ‘Norton’, the official grape of the State of Missouri, is grown in many U.S. regions where V. vinifera production requires extensive pesticide use for fungal disease management. To identify genetic factors of resistance to fungal diseases, a breeding population was developed from a cross between ‘Norton’ and ‘Cabernet Sauvignon’ at the Missouri State Fruit Experiment Station, resulting in 182 progenies. Utilizing this population, 19 different chromosomes of Norton, Cabernet Sauvignon and consensus were constructed using molecular/DNA markers. Downy mildew disease infection was studied 10 days after inoculation in the given population using both visual and quantitative measures. This study allowed us to discover a factor on chromosome 18 that is responsible for downy mildew resistance. Markers associated with this factor can be used to select seedling in young stage in the process of development of new cultivars. A phenotypic difference was observed for Botrytis bunch rot resistance in the same population, which will be utilized to identify corresponding genes after further analysis.

Fatty acid manipulation in soybean oil by altering oil composition is an important breeding objective in the US. Reduction in saturated fatty acid particularly palmitic acid is recommended to improve cardiovascular health. In this study, we were able to identify and confirm new lines that carry low palmitic acid levels.