IN THE LAB WITH

# **Audree Garrett**

The aromatic compounds terpenes have potential benefits to health and medicine. That makes them attractive to researchers like GRA Eminent Scholar **Robin Buell** at the University of Georgia.

Terpenes come in several forms and can be found in a variety of plants.

# **GRA Student Scholar Audree**

**Garrett**, a student at Fort Valley State University, is spending summer 2022 in Buell's lab to help further exploration of terpenes. Specifically, the lab is using a virus to silence genes inside tomato plants so that they yield more high-value terpenes.

To do that, Garrett performs a series of experiments. Here's what that experimental process looks like —>



### STEP 1: Infiltrate tomato!

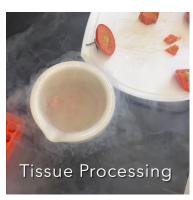
A half-dozen or so different agrobacteria are injected into unripe tomatoes. If tomatoes turn yellow or orange, it's a sign the targeted gene is being silenced from expression.





# **STEP 3: Process tissue**

First, it's flash-frozen to keep RNA from breaking down; RNAlater, a reagent, is applied to protect the RNA. The lab sends some tissue to other researchers for analysis in their experiments — and saves some for its own analysis.



### **STEP 4: Extract RNA**

In a multi-step process, Garrett uses a kit to carefully remove RNA from tissue samples.





### STEP 2: Harvest tissue

For the tomatoes that turn yellow, tissue is removed for analysis.





# **STEP 5: Quantify RNA**

Extracted RNA that is suspended in water is analyzed for optical density — this reveals how much is present. (Knowing how much RNA is present is important for further analysis.)

# STEP 6: Analyze!

Did it work? Was the gene silenced? A test called qRT-PCR provides the answers. The work will be reiterated in future experiments to move closer to changing the machinery of the tomato to produce terpenes that are desired.