

A couple of vendors were evaluated, but the Shimadzu GCMS-TQ8040 NX was found to be the only one that will work in our microbiomes lab for several reasons.

Hardware

- Shimadzu is the only manufacturer who manufactures their instrument in the US and is part of the Buy American Act.
- The Shimadzu GCMS is the only one that can scan at 20000 amu/sec *without losing sensitivity* to both help us keep up with sample load and also have high confidence in our results. This also allows us to set up successful scan/SIM or scan/MRM methods to look for known samples and interrogate samples for novel metabolites in the same run and without sacrificing sensitivity.
- The GCMS has 2 filaments, so it automatically switches to the second filament to maximize uptime.
- The GCMS has pre-quads to protect the main quadrupoles from our dirty samples.
- Helium is very expensive and even being rationed. The Shimadzu GCMS allows us to switch to hydrogen carrier gas with no modification in the event we can no longer secure Helium in the future.
- The GCMS-TQ8050 NX offers a Hydrogen Sensor that will shut down the instrument in the event of a Hydrogen leak (if we move to hydrogen carrier) to keep our staff safe.
- The system has a dual differential turbopump and an upgraded RV-3 rough pump for enhanced sensitivity and greater uptime after maintenance.
- Shimadzu's GCMS has a modern, color touch screen interface and Click-Tek columns to help my users easily swap columns when needed. Our students can even access the software remotely to check their batches.

Software

- The datafiles are project-driven. This allows us to get easy support from Shimadzu because the datafile includes all method, tune, and batch information for easier troubleshooting.
- Shimadzu's system includes the latest version of the NIST/Wiley libraries.
- **Shimadzu is the only vendor with a comprehensive SMART Metabolites Database with nearly 500 compounds identified in blood, urine, and serum matrices. The SMART database comes with all MRM, SIM, Scan, Scan/MRM, SIM/MRM modes of method parameters including collision energies to make our method development easier. To increase S:N, the system automatically builds the MRM tables with the instrument duty cycle in mind.**
- **Shimadzu's software will also allow us to create our own library for any new metabolites we might find, and we can search on 5 different libraries.**
- **Since our samples are biological, we are bound to have complicated chromatograms with many peaks. Shimadzu utilizes retention indices for greater confirmation in library results. And, when we clip the front of our column, Shimadzu's system can use an n-alkane mixture to automatically adjust all peaks/retention time windows instead of just at a single spot on the chromatogram, saving us a lot of time to focus on other tasks.**

Support

- Shimadzu is the only manufacturer who provides free onsite training for as long as all our users need to feel comfortable using the instrument. This training can continue even beyond the warranty period and even if we do not have a service contract or after the 1-year warranty.
- Shimadzu also is the only vendor who will help us with current FAME projects as well as bile acids and future intestinal metabolites of interest.
- Shimadzu does not charge anything for phone or onsite training or technical support even beyond the warranty period and even if we do not carry a service contract.