This machine will kick off the collaboration between Caleb and Ed to work on the plant/animal stuff.

Begin forwarded message:

From: Arielle Johnson ████████████████████
Subject: Re: Mass Spec device
Date: September 5, 2017 at 3:07:36 PM EDT
To: Caleb Harper ███████████████████
Cc: Edward Boyden ████████████████, Joichi Ito <████████████████>

Hi-

We are getting a Gas Chromatograph-Mass Spectrometer System from Agilent Technologies with a 7890B model GC and a 5975 triple qudrupole electron impact mass spec.

The autosampler is made by a different company called Gerstel. It is a Gerstel MPS model autosampler.

The whole setup works together to accurately extract, sample, separate, and identify/quantify mixtures of volatile (i.e. in equilibrium conditions, spending a significant amount of time in the gas phase) molecules.

To detect and analyze these molecules, which tend to be in sub-part per million concentrations and inside plant tissue and other solids/liquids, a sampling and concentration step is necessary. Previously (and some labs still do this) a solvent extraction-distillation process was used to do this, but this is time consuming, labor-intensive, uses hazardous materials, and is often not satisfactorily representative of the proportions of molecules that are smelled-i.e., in the gas phase. Around 20 years ago or so an analytical chemistry group in the Czech republic developed a technique that samples from the headspace above a sample (recall that since we are measuring volatiles, the molecules of interest spend some of their time in the gas phase) and uses and absorptive polymer instead of a liquid solvent.

This technique (headspace-solid phase microextraction or SPME) has the added benefit of being highly automatable—instead of having a graduate student do a series of timed extractions on the bench with a stopwatch, it became possible to aliquot out several sample into vials, and perform a timed/temperature controlled sampling and analysis of each with an autosampler robot. It's still necessary to prep the samples by hand and there's a lot of hands-on parts to the data analysis, but it greatly increases throughput and accuracy.

This is the GC model we're getting, refurbished: ████████████████████████
chromatography/gc-systems/7890b-gc
and this is a brochure for the GC-MS setup http://hpst.cz/sites/default/files/attachments/5989-7827en-5975-broschure-lr.pdf

Agilent makes an autosampler, but for our extraction technique I've always used, and have always had recommended to use, the Gerstel model.
this is the autosampler: ████████████████████
this is some info from Gerstel about SPME: ████████████████████████████

let me know if I can clarify anything; I'll be in Cambridge in person next week

best

Arielle