Nanoliter

CAN POTENCY BE ESTIMATED AT ONE SECOND/SAMPLE WITH A CELL PHONE & AN MS?

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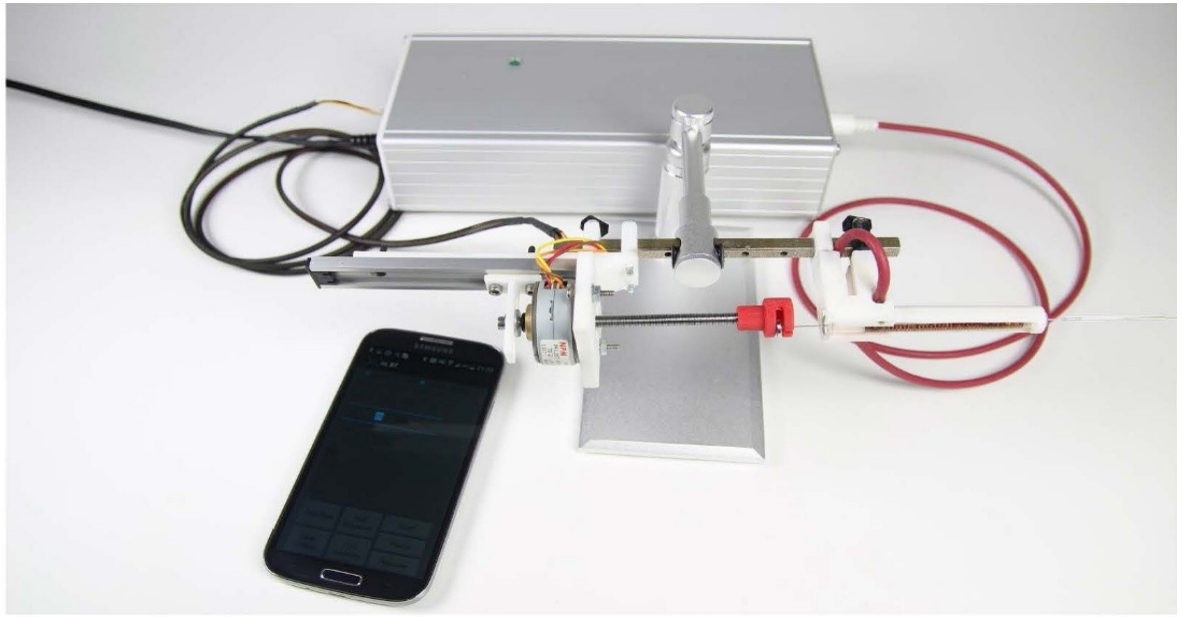
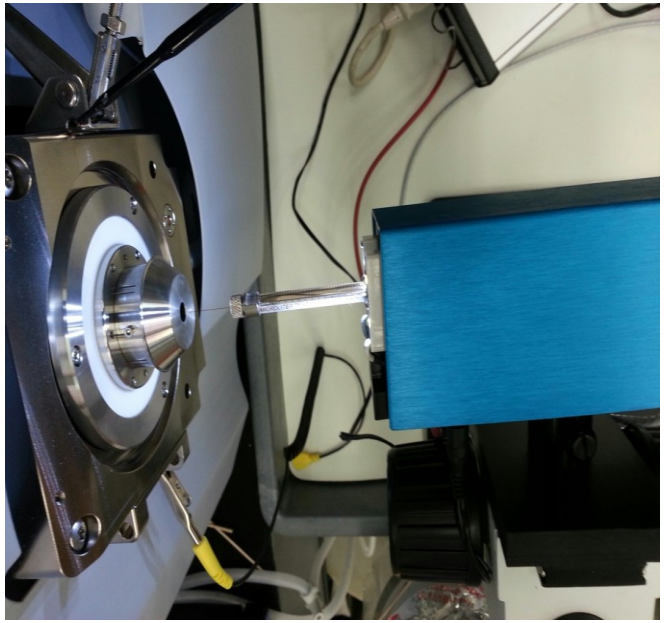




Nanoliter

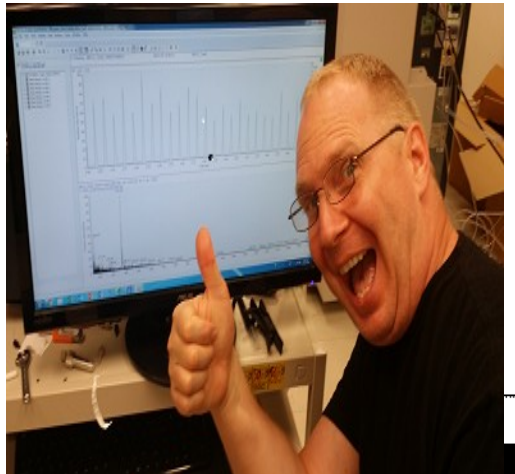
Who is using rapid nanoLiter sample input now?

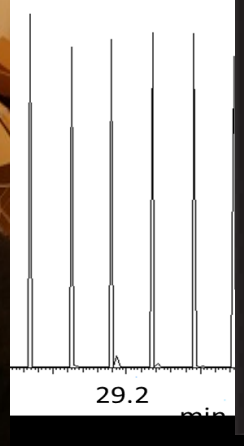
US DOE at Idaho National Lab, Lanthanides/Actinides.

Idaho National Laboratory

US Army at Aberdeen Proving Ground MD. Highly toxic, ***VISCOUS*** liquids/agents.

University of Cincinnati, nucleosides, nucleotides and related entities.



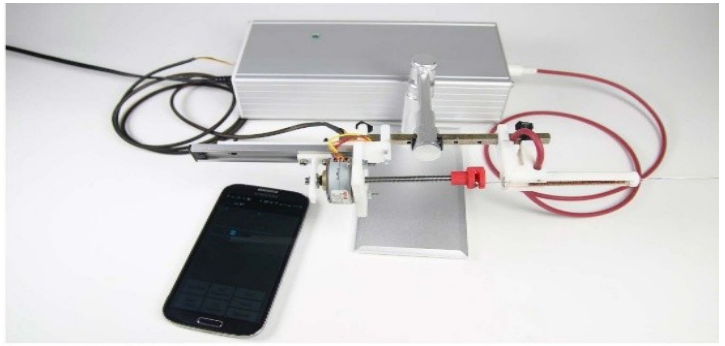


CINCINNATI BEARCATS

Example customers, clients: U's of Ill, WI, CA, Cinn., MUSC, Wash. U., USF, USU, US Army APG, ECBC and Natick, Abbott, Biogen Idec, Genentech, Amgen, Hitachi, Allergan, Spark, Douglas, NIH, NIST, USDOE INL, Ga Tech, UNH, Duquesne, NASA, Air Force, Air Force, and Sciex offered to license. +. Agilent's John Sausen request IBF information.

Patented Droplet Devices.

ESI



Same Cell Phone Controller.

MALDI

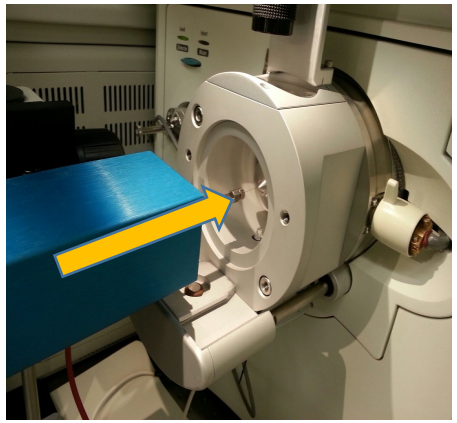
Fly droplets into MS!

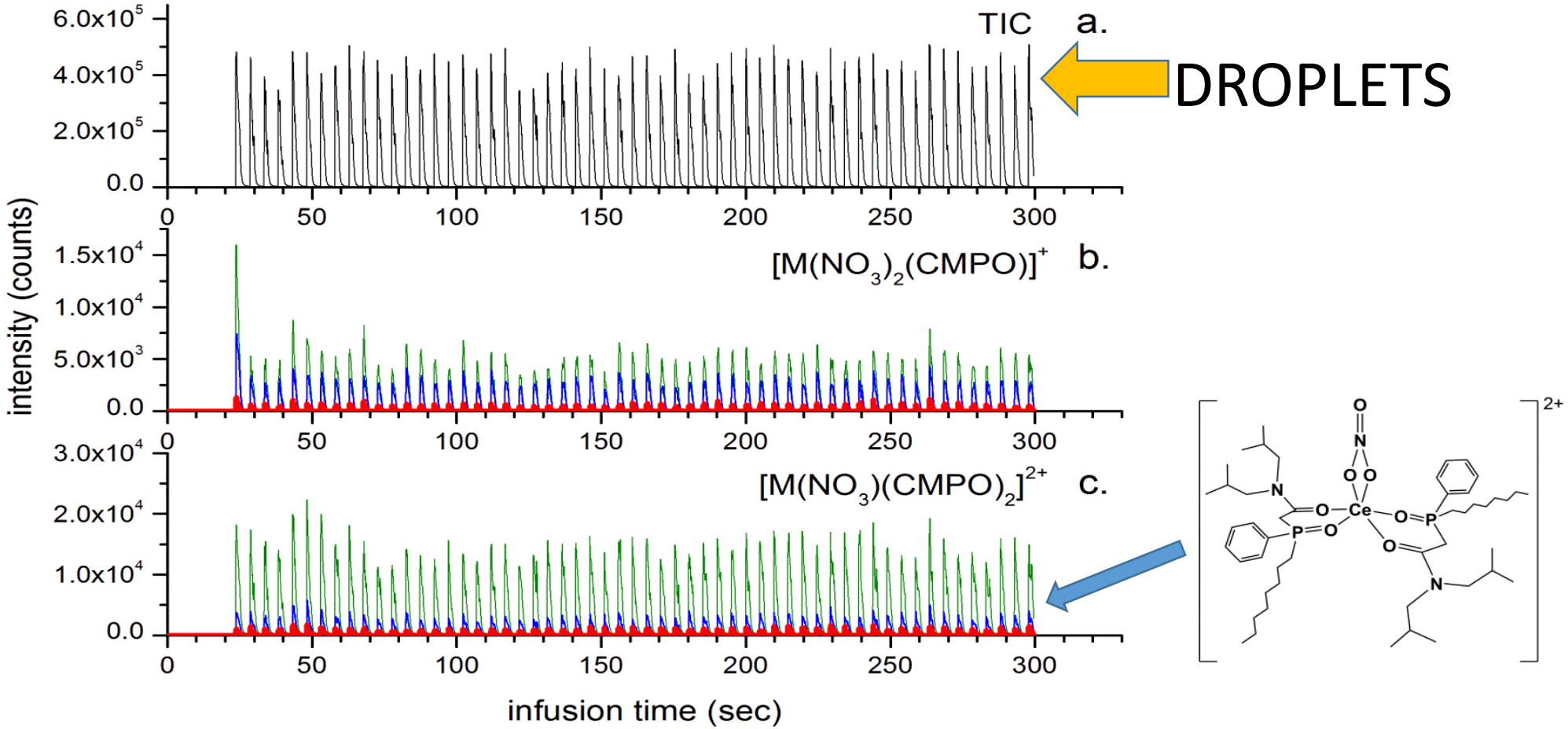
Fly droplets onto target for MALDI,SIMS, LDI.

DROPLETS: IBF MS, Lanthanide Chelate From Idaho National Lab.*

Fastest, very efficient (100% or less), versatile and simplest MS sample introduction technology in the world! non-touch, low volume, dispensers, treatment devices for ESI or MALDI.

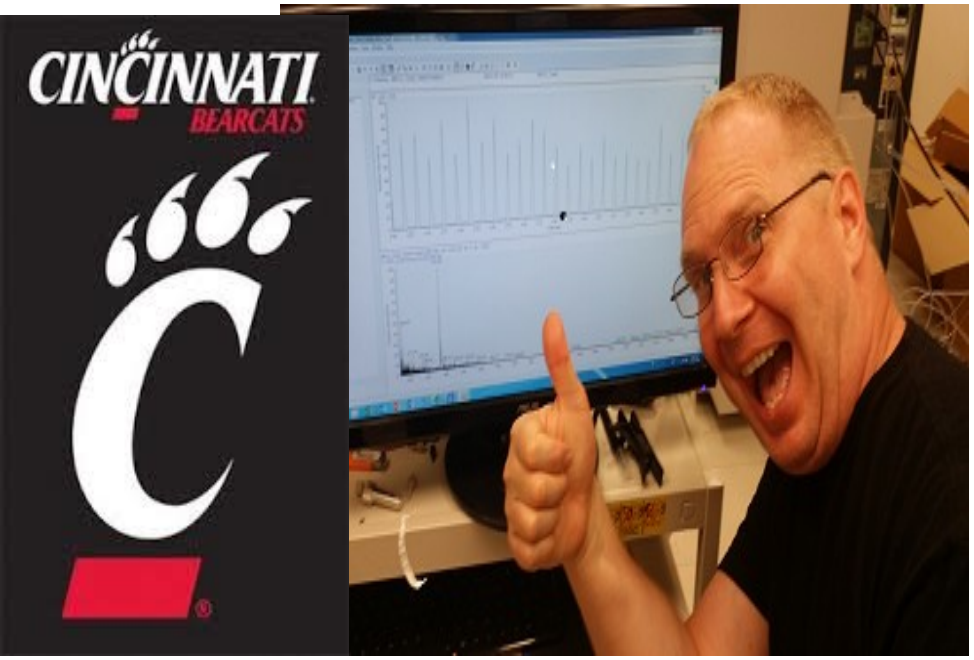
Droplets into MS's, Rapid, @ INL, reproducible with 100% "all-in" !

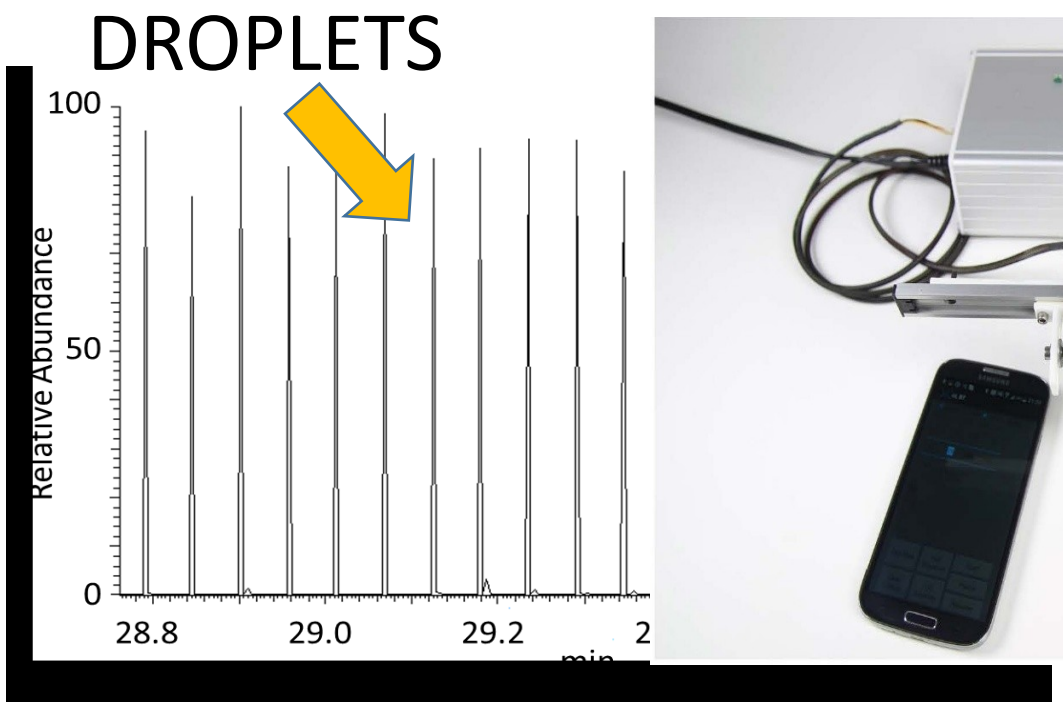


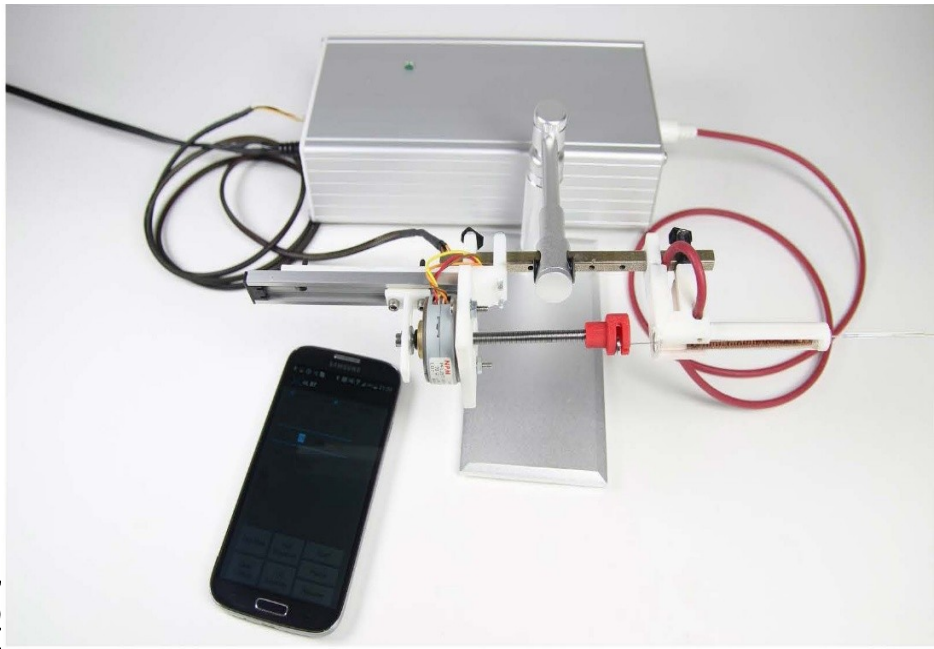


Positive ion profiles generated by individual drops. a. Total ion current. b. $M(NO_3)_2(CMPO)]^+$.
c. $[M(NO_3)(CMPO)_2]^{2+}$. Blue = Ce^{3+}, Green = Tb^{3+}, Red = Lu^{3+}. * Bruker u-ToF, +eV, relflectron, 12 Hz, 50-2000 amu. (16).

DROPLETS: IBF MS/MS Infusion of Nucleosides, Nucleotides, RNA Hydrolysates, U. Cincinnati.







IBF-LC-MS/MS data of droplet introduction over a one minute acquisition window., 5, nucleosides (Cy, Ur, 5MeUr, Ad, 2MeAd.), ASMS 2017, P. Limbach, et al. Dr. Ross celebrating. Device, nL Programmable Wave, an Android based source,

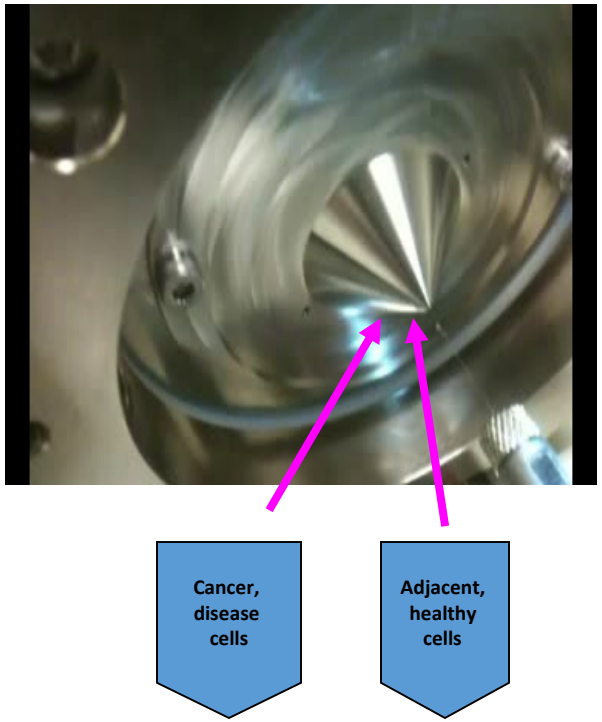
The intervals between droplet arrival in the mass analyzer are characterized by no background. More importantly, the relevant sample information is present within a single droplet. That is, an integrated mass spectra across droplets agrees with that from a single droplet as previously published in Analytical Chemistry in 2013 by us and P. Limbach et al.

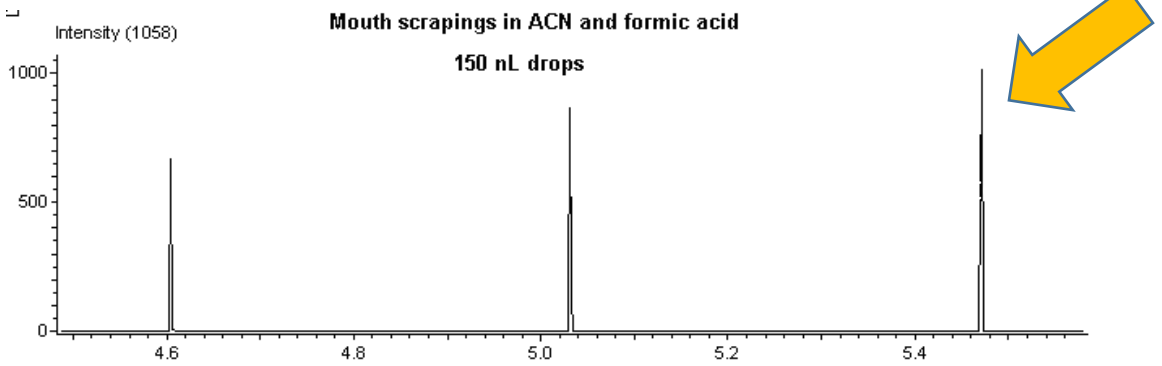
It is thought, but not proven, that this intensity variance shown by the yellow arrow and ? is because there was no cover over the inlet. Lots of other data shows excellent reproducibility. Data is + eV, conditions reported ASMS poster of Limbach, Sauter, et al.

DROPLETS: Shoot “cells & cellular” liquids into an MS systems. EPA LV.

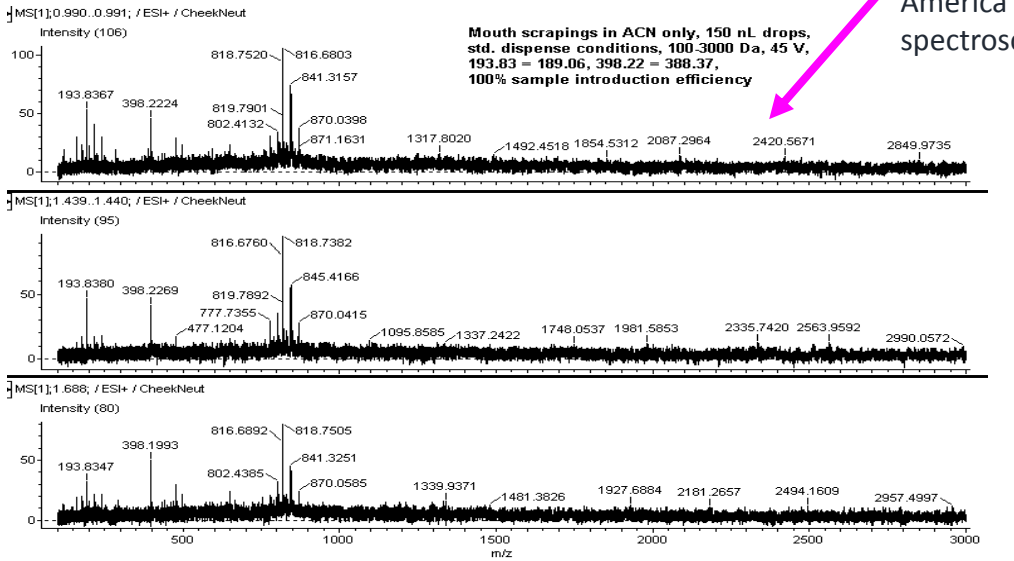
100% reproducible cell/saliva sample introduction into an ESI/MS ! Biomarker, direction discovery tool ?

DROPLETS





Spectra called “exciting” by America’s greatest mass spectroscopist!



Can IBF of cells, fragments <u>efficiently</u> direct biomarker discovery?

I believe so and I’m seeking cancer, disease R&D collaborators.

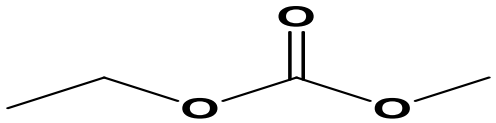
NIH considering doing bacteria this way, may not need a laser or may have an alternate approach.

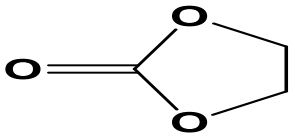
Mass spectra from three 150 nL droplets containing white matter, cells, human saliva.

DROPLETS: Single drops from an OPERATING! Li+ battery electrolyte + fire retardants, DOE INL.

Dr. G. S. Groenewold, et al, Idaho National Lab. Early input by Drew Sauter nanoLiter LLC.

- Coin cells: dependent on Li^+ transport in carbonate electrolyte – weakly coordinating solvents
  - EMC
  - EC
- Breakdown can lead to H_2 production, flammability issues





Idaho National Laboratory

100% Shot into MS !

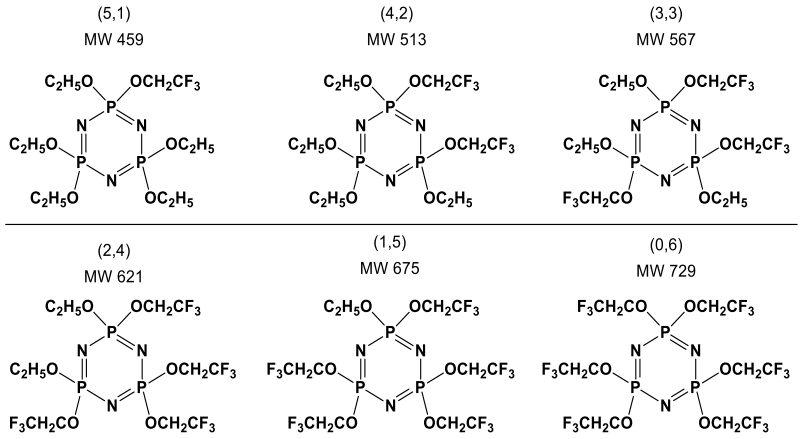
FedExs to Elon Musk!

ESI MS, MS, IMS

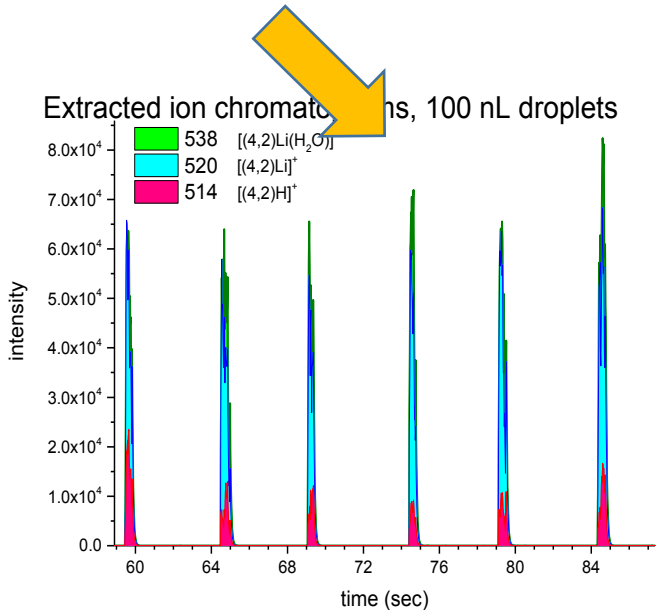
Lithium ion battery w/fire retardants

$(Ethoxy)_x(2,2,2\text{-}triflurorethoxy)_y$phosphazene cyclotrimers

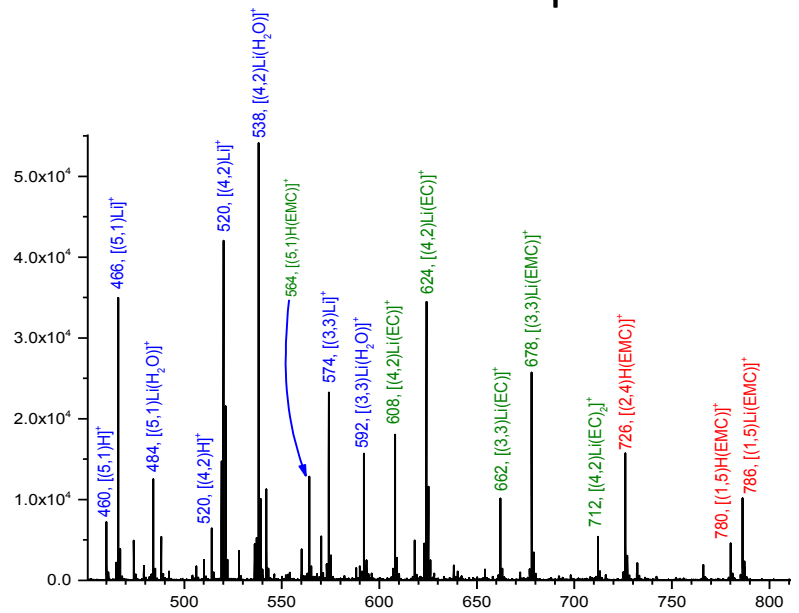
(x,y) short hand nomenclature



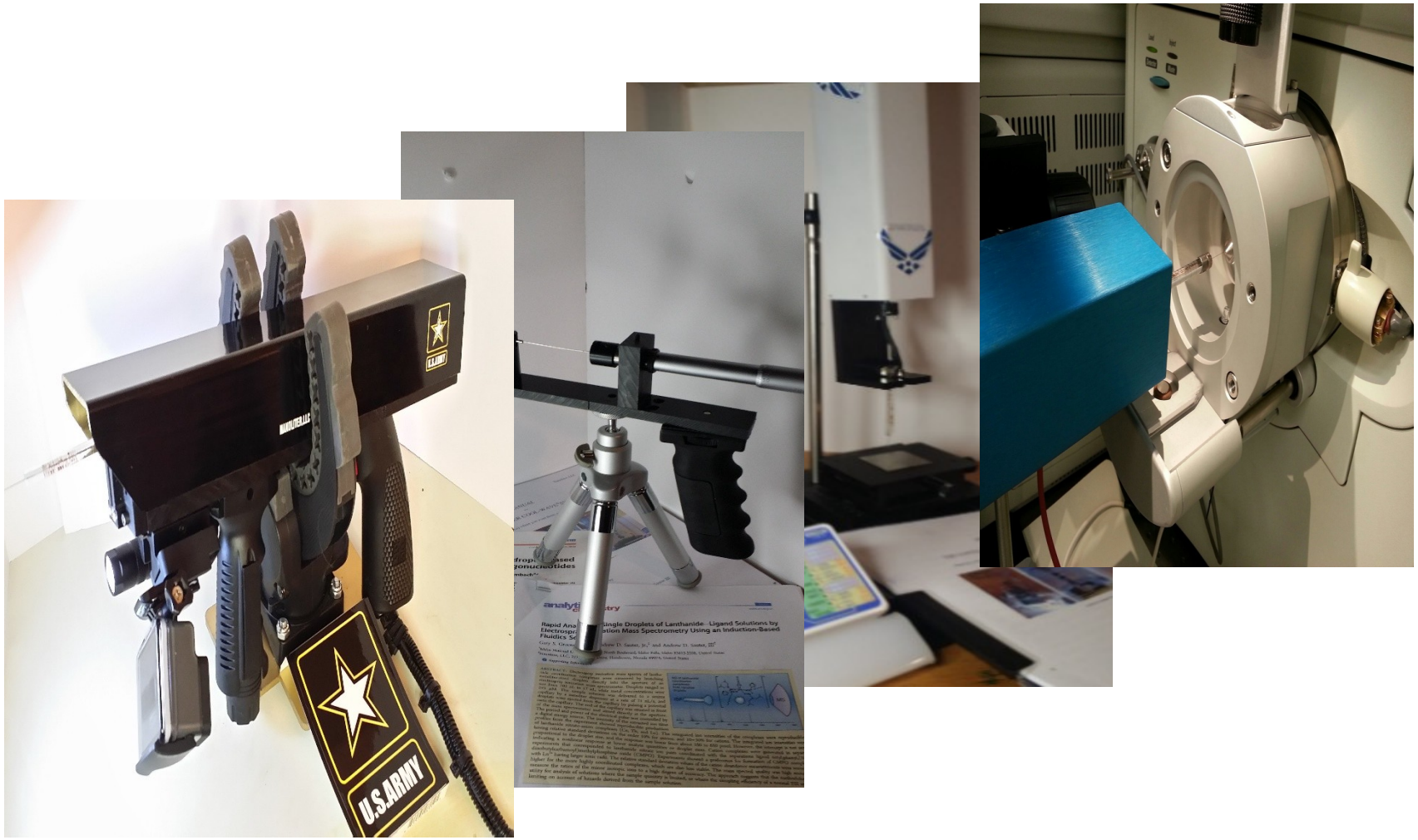
DROPLETS into an n ESI!



HRMS of nanoLiter droplets!



DROPLETS for US ARMY APG-X1 DEVICE: INTO/ONTO TARGETS. CLASSFIED WORK.



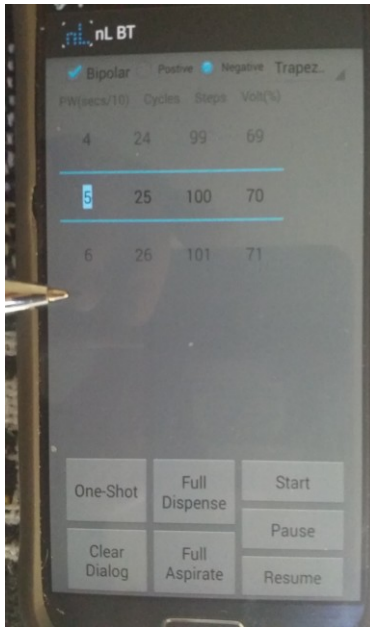
Fly's nLs to targets of even viscous liquids in classified projects and other efforts onto or into targets!
APG,MD Army validation from 5 – 500 nLs. ASMS 2016. GoPro® too!

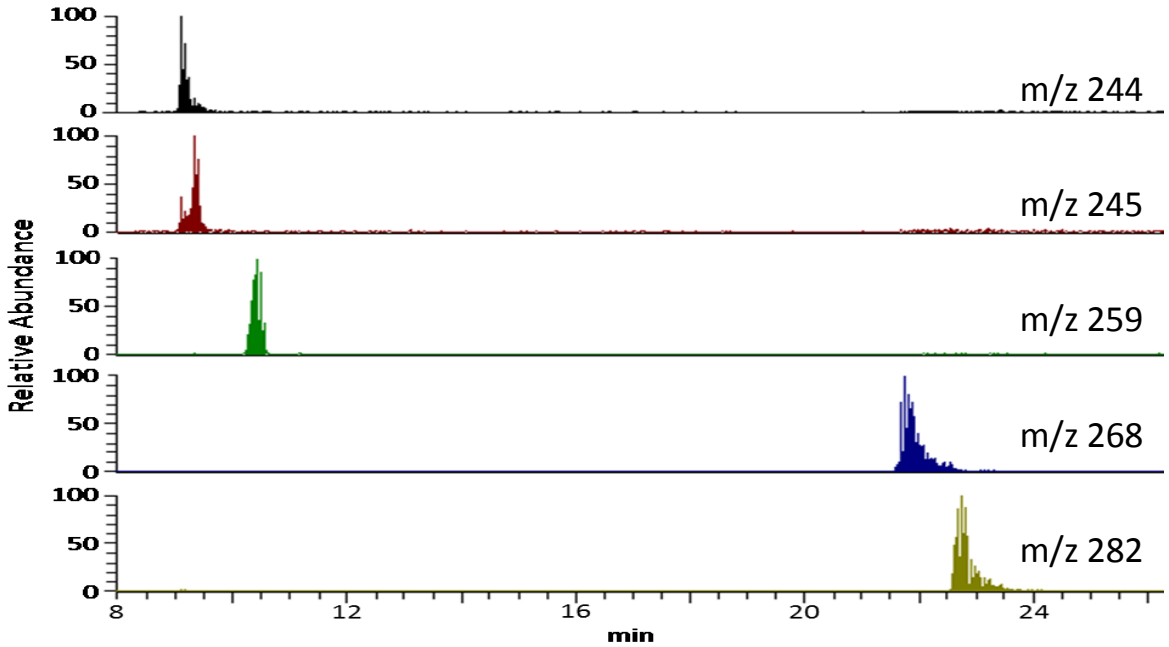
IF CHROMATOGRAPHY NEEDED.

THE nL PROGRAMMABLE WAVE= 100% INPUT EFFICIENT ESI UPLC MS. ANDROID CONTROLLED

ALLOWS YOU TO CREATE & CONTROL DROPLET TIMING, ENERGY, WAVE FUNCTION, VOLUME, POLARITY & LOCALE.

A POWERFUL VERY RAPID ESI LCMS & ESI INFUSION R&D DEVICE! WE CONSULT TOO!





Extracted ion chromatograms of nucleosides, top, cytidine, uridine, 5-methyluridine, adenosine, and 2'-O-methyladenosine separated on a PGC capillary column and introduced into the MS by inductive charging. per Asilomar 2016 at U. of Cincinnati with Drs. Ross & Limbach. Also, see P. Limbach, et al , JMS Oct. 2015.

THE PROGRAMMABLE WAVE ALSO MAKES EXCELLENT MALDI, SIMS, LDI CRYSTALS VIA THE ***SAME IBF DEVICE!***

IT ALSO HAS WET LAB APPLICATIONS, e.g., CRYSTALLOGRAPHY, TLC, and OTHER VERY COOL APPS (OVER).

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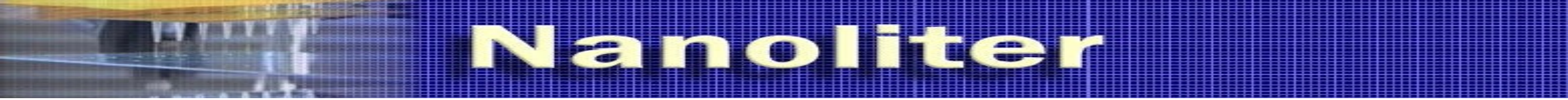


ISSUES REGARDING PATENTED RAPID (1 to 10 SECOND/SAMPLE) POTENCY SREENING.

ARMY, DOE, MAJOR U's, AIR FORCE & OTHERS USING THE TECHNOLOGY ACROSS THE USA.

* It's speed. It's plenty fast enough!

* Ion trap, simple might be possible! CID or HRMS if needed!

*100% sample introduction efficiency , millisec. intro. Possible.

* Solves the N and sampling problem. Acquire variance !!!

* Isobaric interferences a big problem?
  - Alternate analytes or scans types.
  - Parallel analysis.
  - Reactive, Other CID.
  - Really Rapid chromatography?
  - Other ?

* CAN IT BE DONE? I BELIEVE IT CAN BE GIVEN THE INCENTIVE.

Pics & video clips.

10 Slide Overview

Cool Video,

5 sec IBF, ESI sample input, INL

0.5 sec IBF,ESI sample input,INL

1.0 sec, IBF, ESI sample input UCSD.

Robot/MALDI & LC/MALDI

nL Programmable Android Dispenser,

IBF UPLC MS.

More at nanoLiter.com

Nanoliter

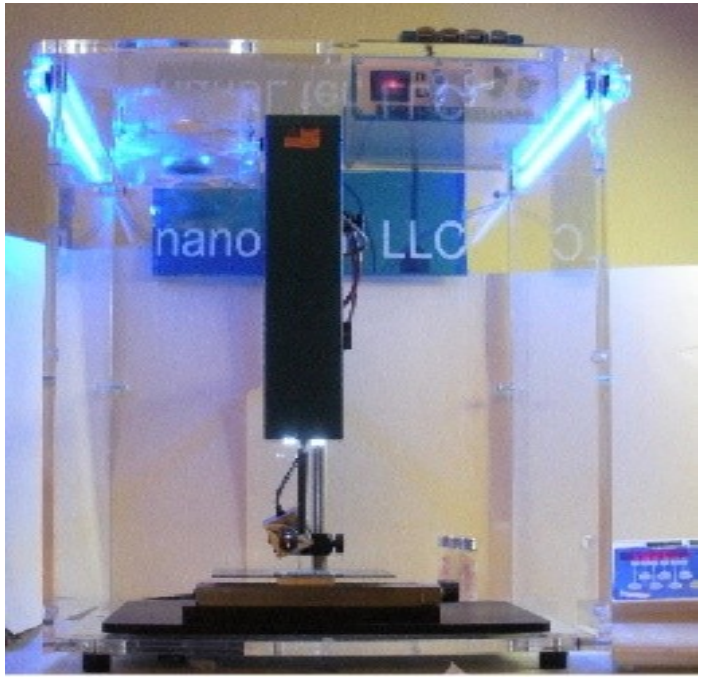
Doing Science, Business. Seeking Licensed Marijuana collaborators, growers?

ANNOUNCE DEAL WITH EAST COAST MS FIRMS

Bringing IBF technology, equipment, connections (informal UNLV collaboration) IP and IBF course to MS.

Video clips

Cool Video, 5 sec input, 0.5 sec input, 1.0 sec UCSD Data, nL Programmable, IBF UPLC MS.



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