The nanoLiter, microliter syringe and syringe/MS via IBF.

We seek to **license** this technology, globally.

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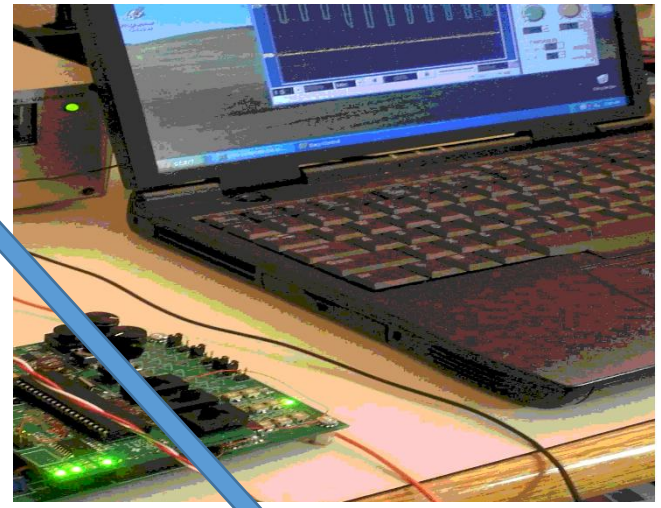
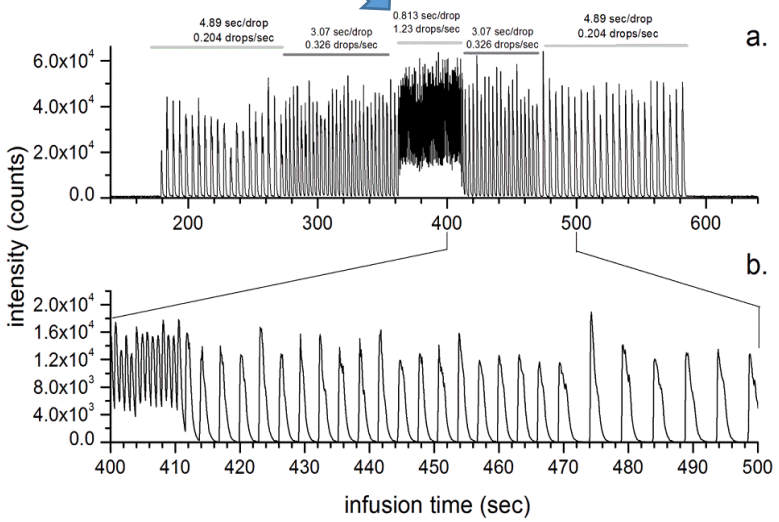
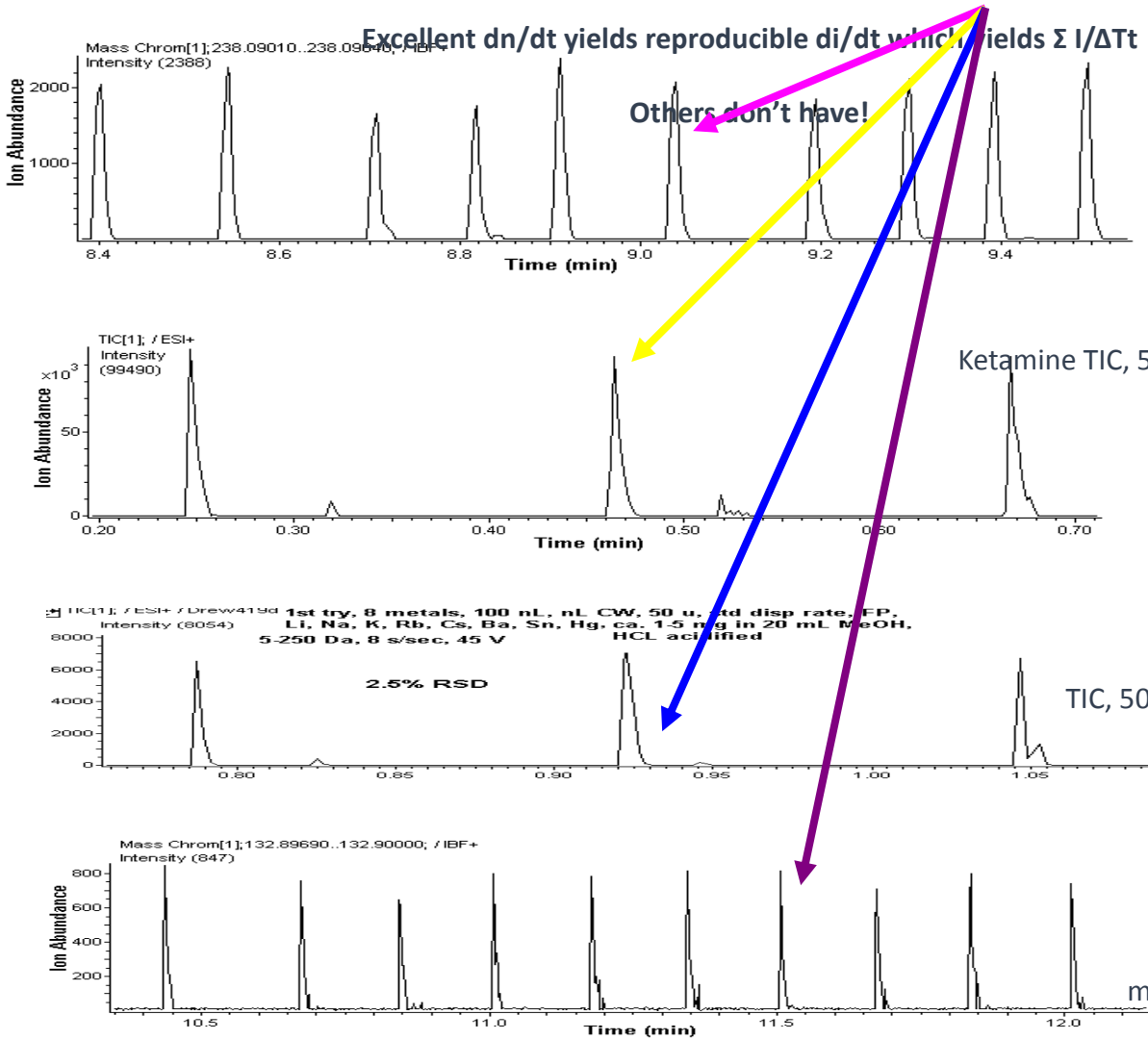
At INL we demoed the **fastest** (msec), most **introduction efficient** (100%) MS sample introduction in the world using an IBF syringe morph and as published in Analytical Chemistry June 2013.

Various syringe, E syringe/mixers morphs & results.





Syringes Reproducibly shoot, 100% of single nL droplets into a TOF MS or onto other targets.



First try, 60 pg ketamine, 50 nLs
m/z 238, N=10 RSD = 11.0%

Ketamine TIC, 50 nLs, 60 pg, n= 3, RSD = 3.5%

TIC, 50nLs, ppm metals, n=3, RSD 2.5%

m/z= 133, 50 nLs, Cs+ n=10, 7.9%

Patented 2000,04, & 7 + 10 and 4 pending in multiple embodiments.

IBF, Further Syringe Realities, Possibilities ….

* Droplet level control !

* Millisecond sample throughput, fastest on planet !

* IBF should allow for the increase in LCMS sensitivity (ca. 100- 1000) x given the 100% intro efficiency. 10x (100x?) to date.

* 10 x increase in LCMS shown in our other ASMS 2014 poster for oligonucleotides. See Limbach et al. this meeting.

* **SAFETY** improvements for agent, radiochemical, neurotoxin, etc. work. Use less stuff !

* **SAVINGS**….. on solvents, ca 90-95%, eventually !

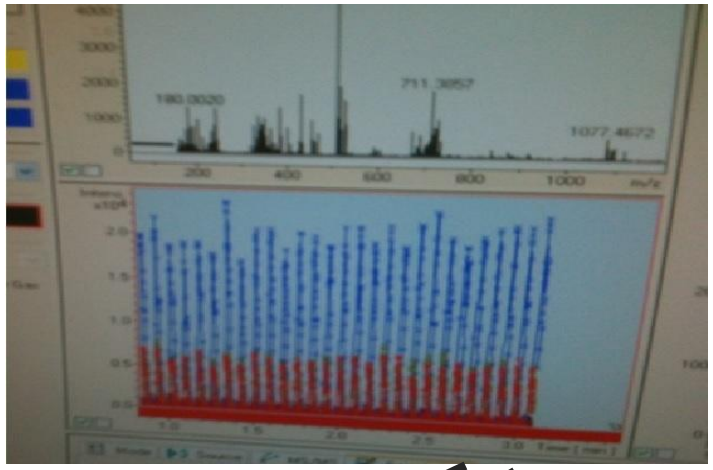
* IBF could realize dynamic sensitivity selection.

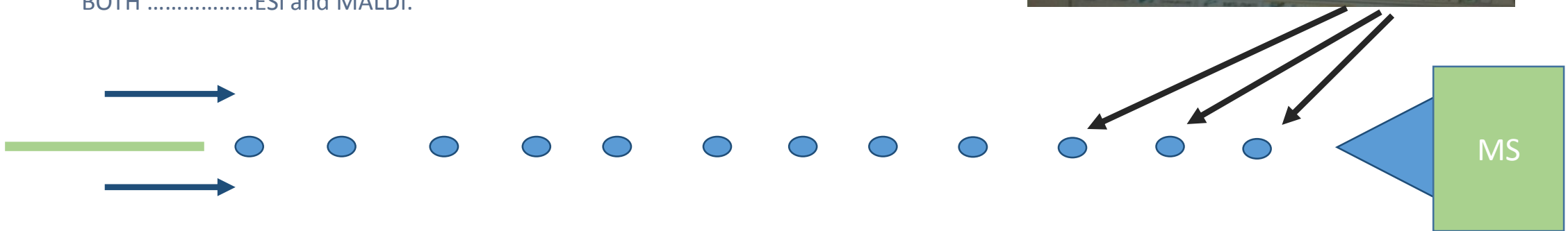
* IBF could provide for “blast mode”, i.e. shooting the entire LC peak.in 10’s of milliseconds.

* Highly multiplexed systems, n= 10 or 20?

IBF can do this in milliseconds hot from droplets to stream to spray mode using one circuit for

BOTH ……ESI and MALDI.





Electric induction and syringes can be used to fly liquids into/onto targets of all types.

* IBF can shoot nL drops into levitated drops.

* IBF can shoot 100% of liquids into mass spectrometers.

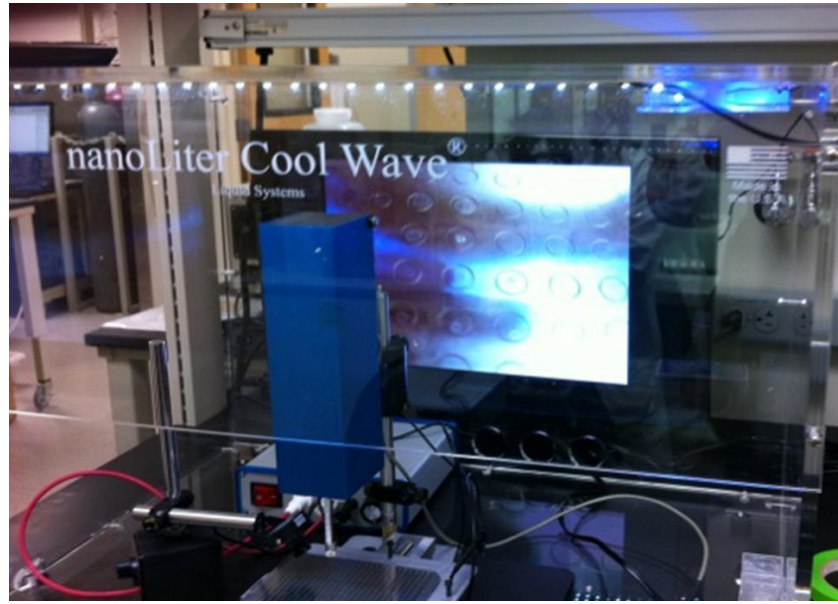
* IBF can make depositions for MALDI, SIMS, and TOF MS sample introduction.

* IBF can makes fast depositions, ca. 5 to 20 per second which may improve analysis logistics.

* IBF can dispense viscous liquids: whole blood; serum; cell fragments into, near MS's, etc.

* IBF can make features for medical diagnostic devices.

* IBF can accomplish highly parallel dispensing, SPE, LC in milliseconds, robotically.



* IBF can morph pipettes, syringes, pumps, chips, LC, UPLC intro new devices that can dispense liquids non-touch.

* IBF can fly liquids to "anything" from almost "anything" …… for MANY APPLICATIONS!

Nanoliter

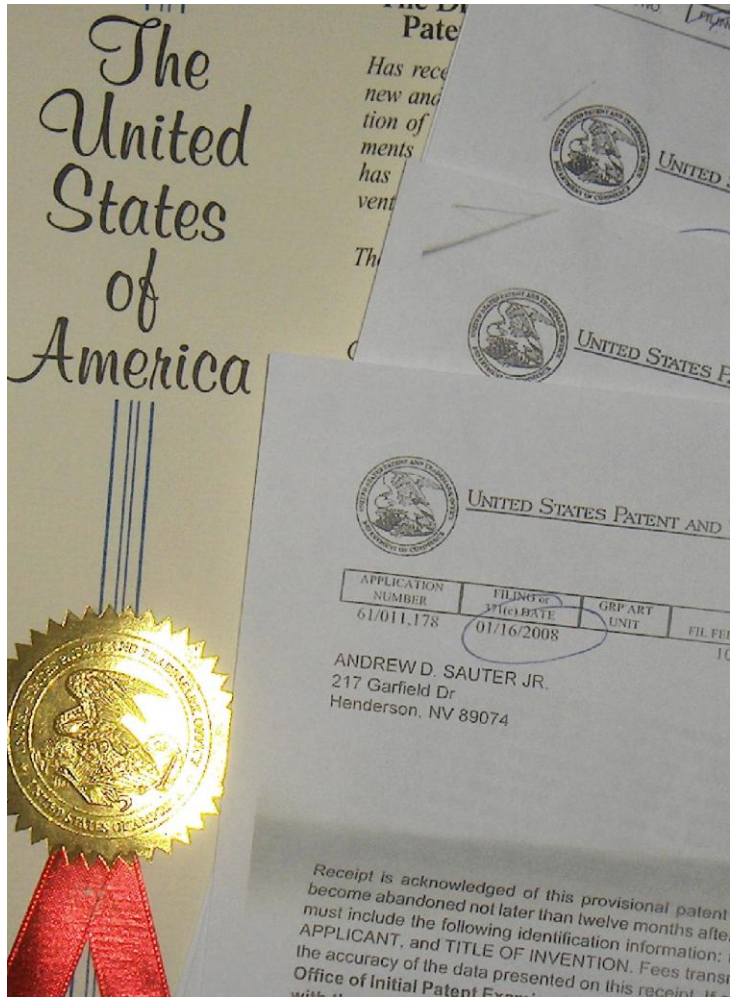
MicroLiter Syringe, Application Summary.

IBF technology can be appended to **YOUR SYRINGES m**aking them ……..

* A non-touch nL/uL dispenser for MALDI, or

* An ESI ion source,!!!, and a

* general purpose non-touch nL/uL dispenser for ***viscous liquids!***



Consider licensing IBF technology, non-exclusively that can morph your existing pumps or platforms into NEW ESI ion source, MALDI and viscous liquid dispensing market spaces!

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