

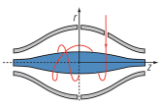
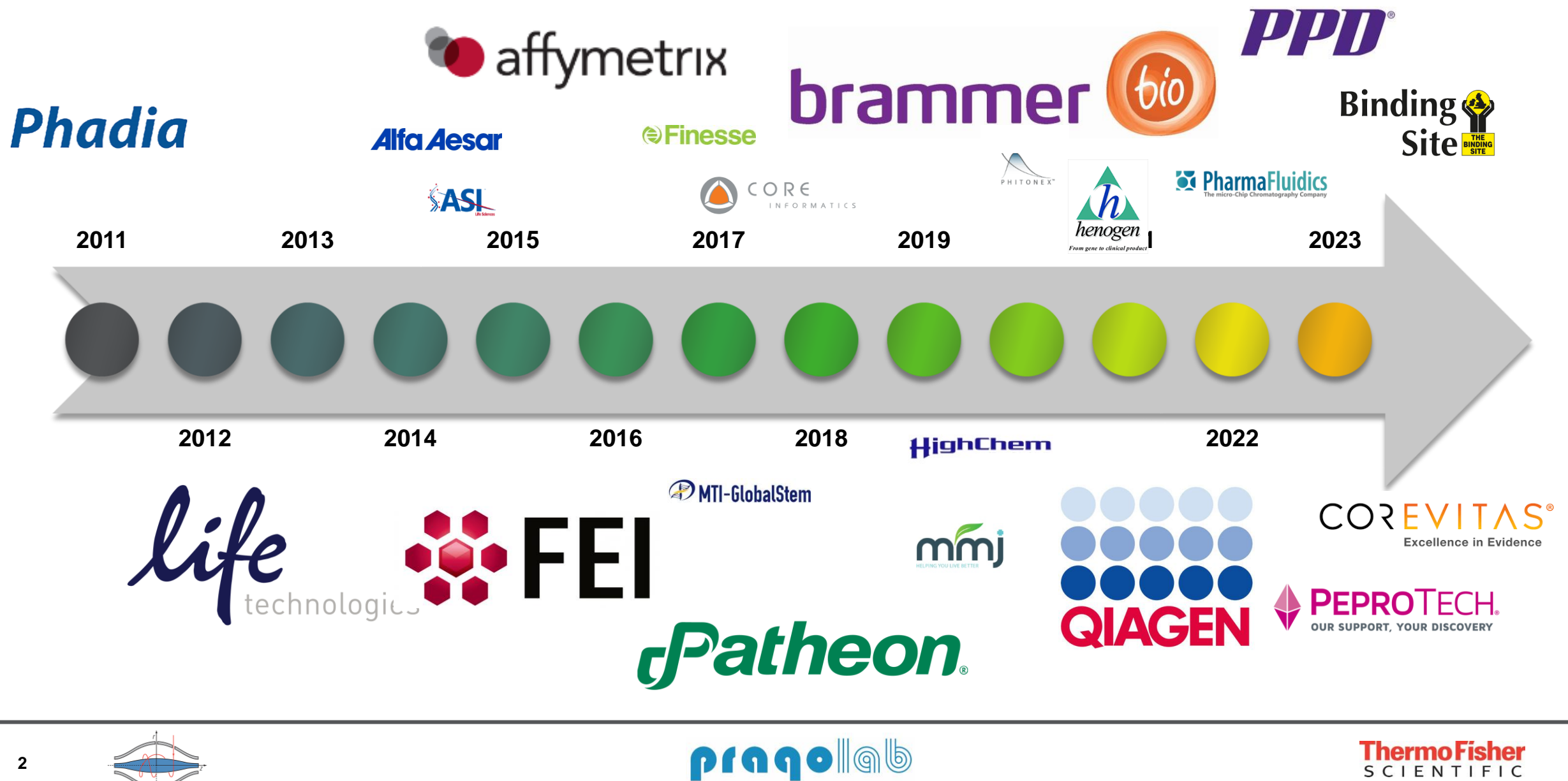
Nové možnosti orbitálních pastí

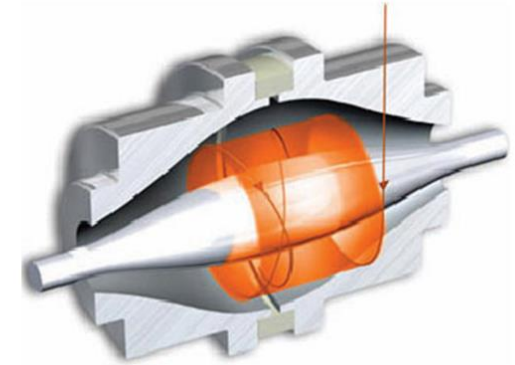
Lukáš Plaček

 The world leader in serving science



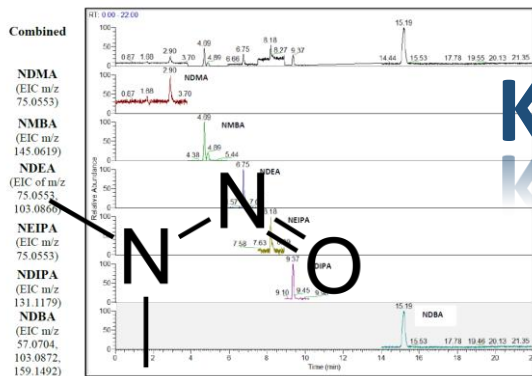
Thermo Fisher Scientific, quo vadis?





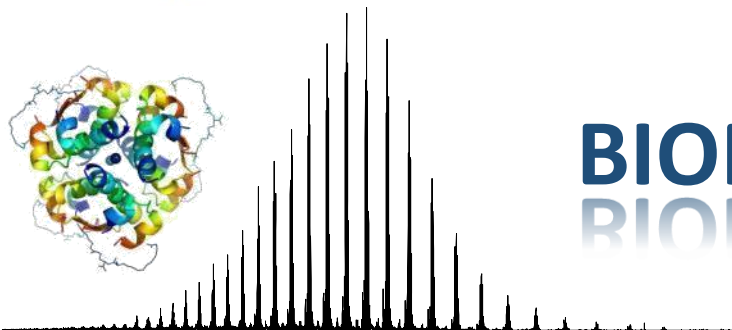
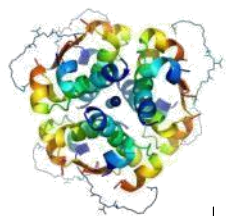
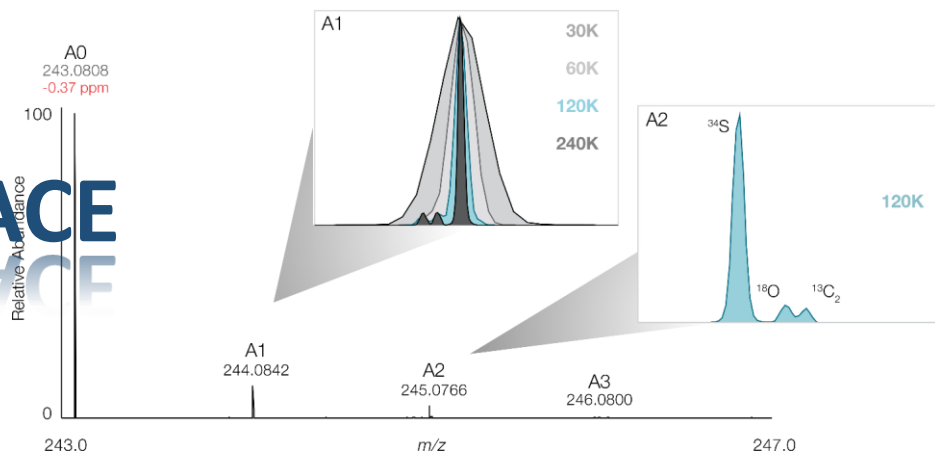
Komplexní diagnostika nemocí,
výroba a analýza léčiv,
zvláště biofarmak

Rozvoj orbitálních pastí pro klíčové oblasti



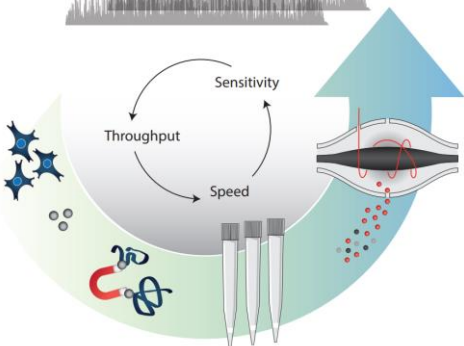
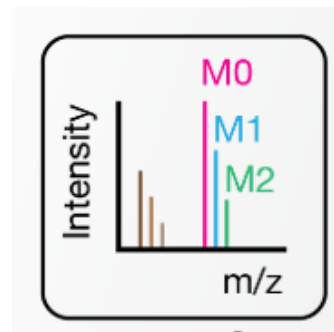
KVANTITA

IDENTIFIKACE

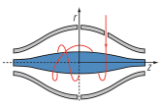
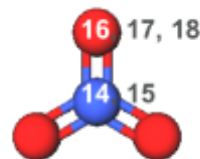


BIOPHARMA

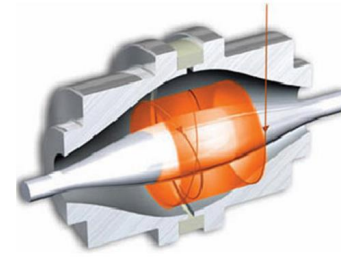
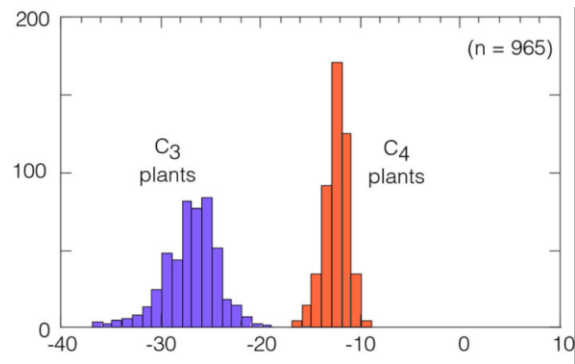
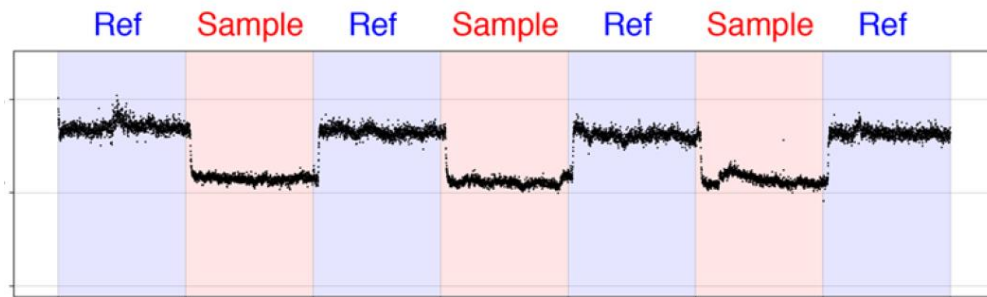
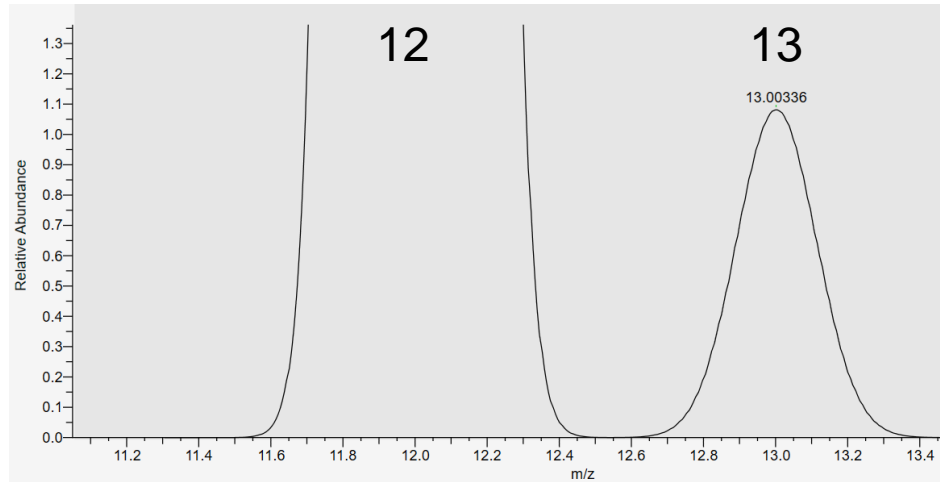
**POMĚRY
IZOTOPŮ**



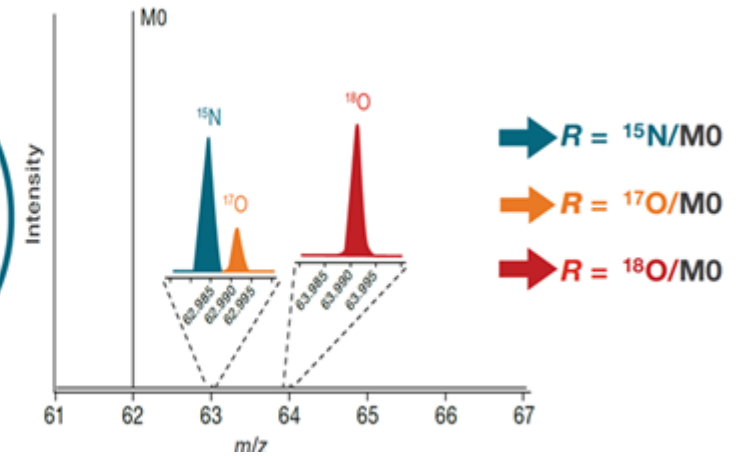
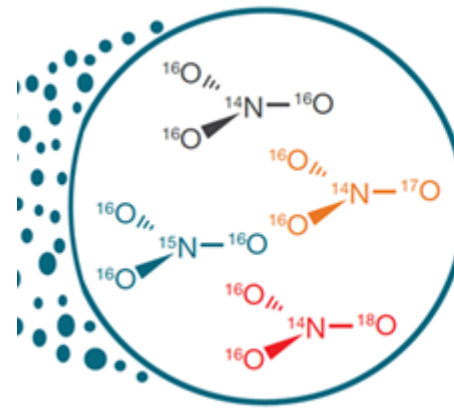
OMICS



Orbitrap pro IRMS



Rozlišení R = 240 000



analytical
chemistry

pubs.acs.org/ac

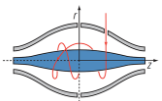
Article

Exploring the Potential of Electrospray-Orbitrap for Stable Isotope Analysis Using Nitrate as a Model

Andreas Hilker,* John K. Böhlke, Stanley J. Mroczkowski, Kyle L. Fort, Konstantin Aizikov, Xingchen T. Wang, Sebastian H. Kopf, and Cajetan Neubauer*

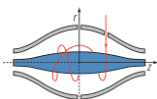
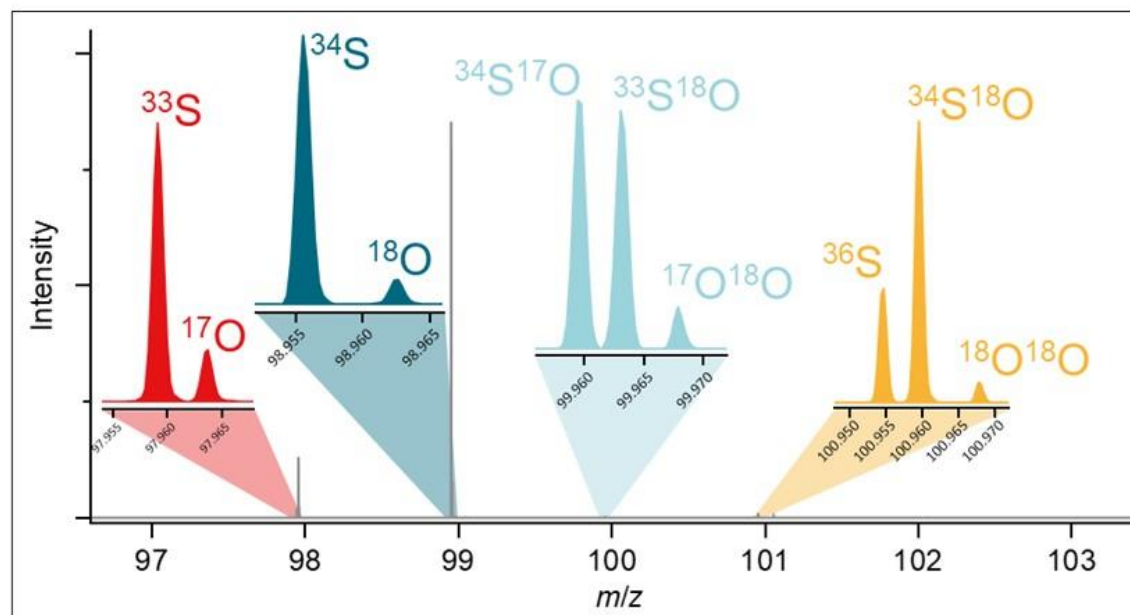
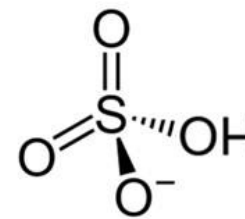
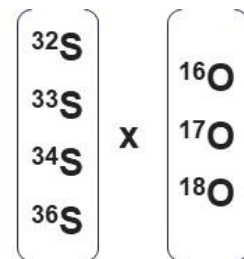
Cite This: <https://doi.org/10.1021/acs.analchem.1c00944>

Read Online

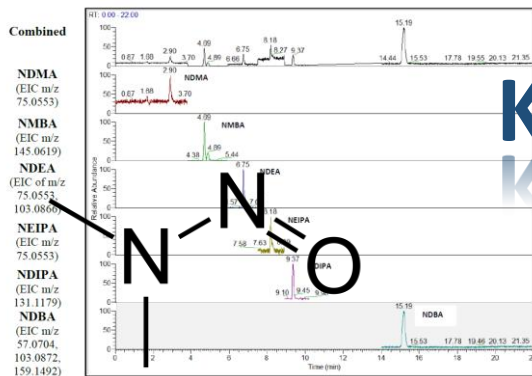


Orbitrap pro IRMS

	<i>m/z</i>	Isotopologue	Abundance
M0	96.9596	$^1\text{H}^{32}\text{S}^{16}\text{O}_4$	9408592
M+1	97.9590	$^1\text{H}^{33}\text{S}^{16}\text{O}_4$	7427
	97.9638	$^1\text{H}^{32}\text{S}^{17}\text{O}^{16}\text{O}_3$	1433
M+2	98.9554	$^1\text{H}^{34}\text{S}^{16}\text{O}_4$	42084
	98.9638	$^1\text{H}^{32}\text{S}^{18}\text{O}^{16}\text{O}_3$	7632
M+3	99.9596	$^1\text{H}^{34}\text{S}^{17}\text{O}^{16}\text{O}_3$	63
	99.9632	$^1\text{H}^{33}\text{S}^{18}\text{O}^{16}\text{O}_3$	59
	99.9680	$^1\text{H}^{32}\text{S}^{17}\text{O}^{18}\text{O}^{16}\text{O}_2$	9
M+4	100.9546	$^1\text{H}^{36}\text{S}^{16}\text{O}_4$	145
	100.9596	$^1\text{H}^{34}\text{S}^{18}\text{O}^{16}\text{O}_3$	333
	100.9680	$^1\text{H}^{32}\text{S}^{18}\text{O}_2^{16}\text{O}_2$	44

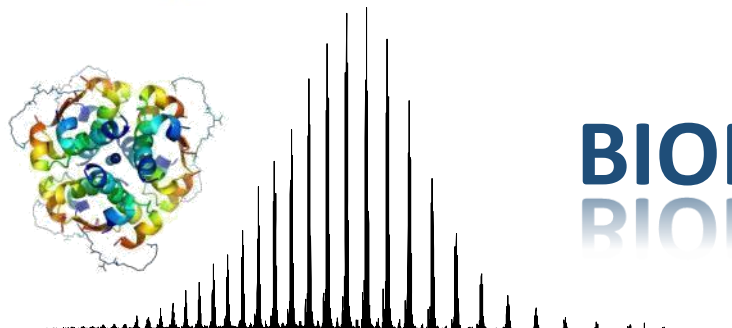
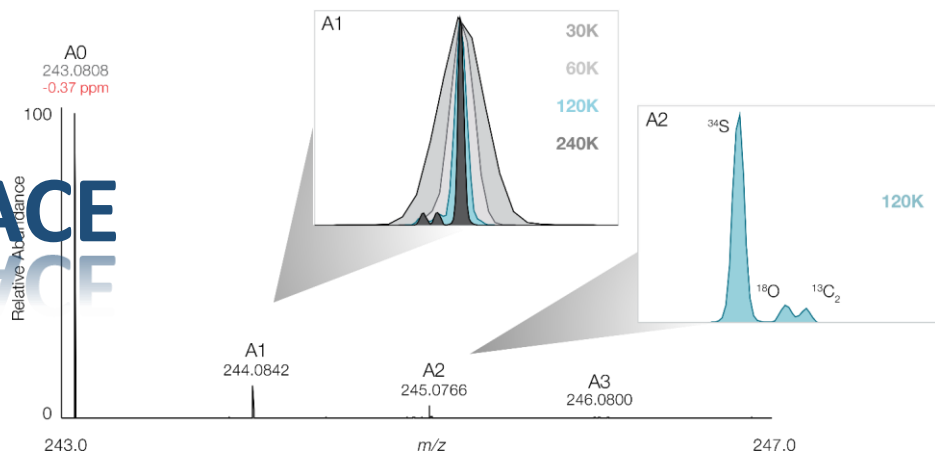


Rozvoj orbitálních pastí pro klíčové oblasti



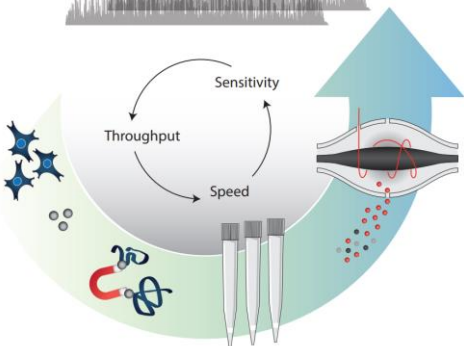
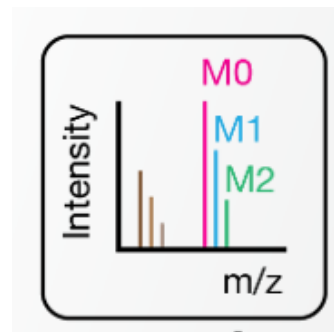
KVANTITA

IDENTIFIKACE

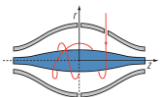
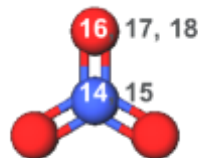


BIOPHARMA

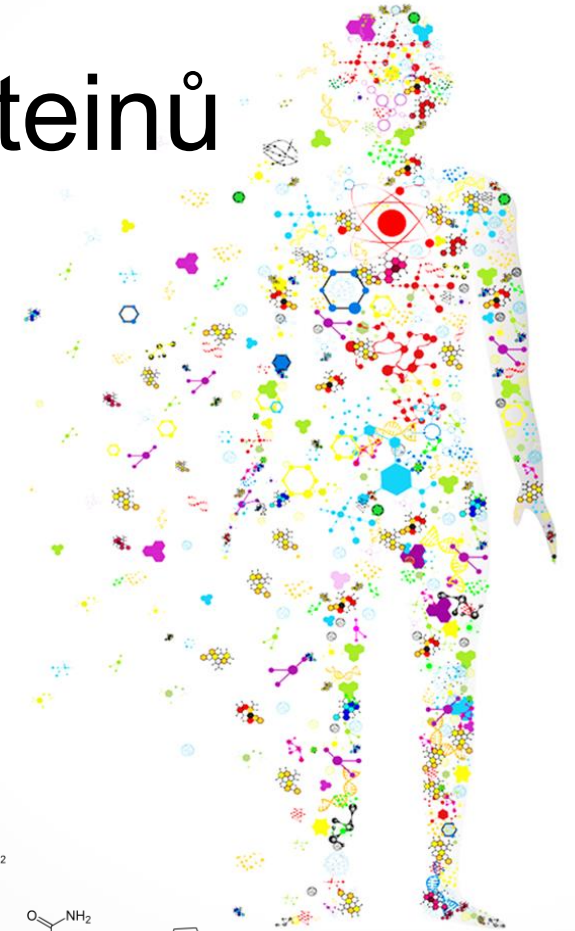
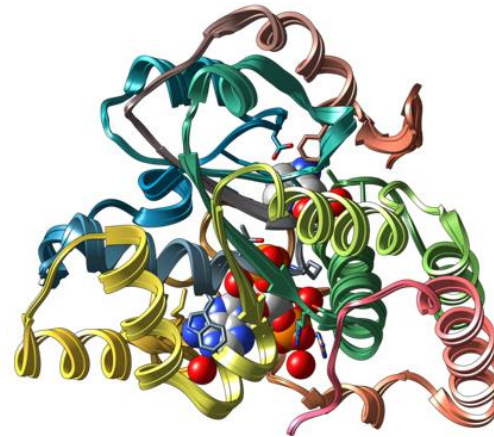
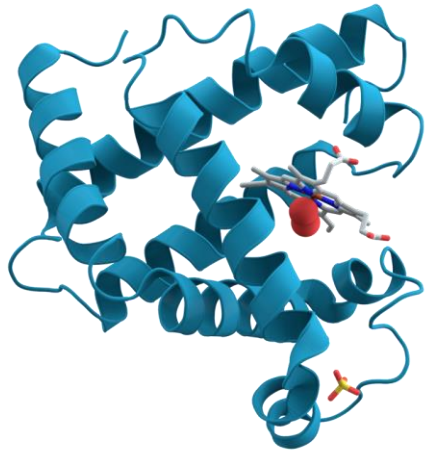
POMĚRY IZOTOPŮ



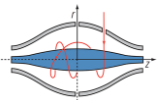
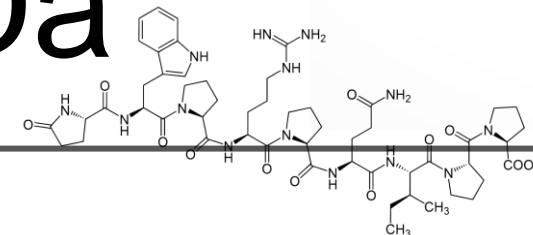
OMICS



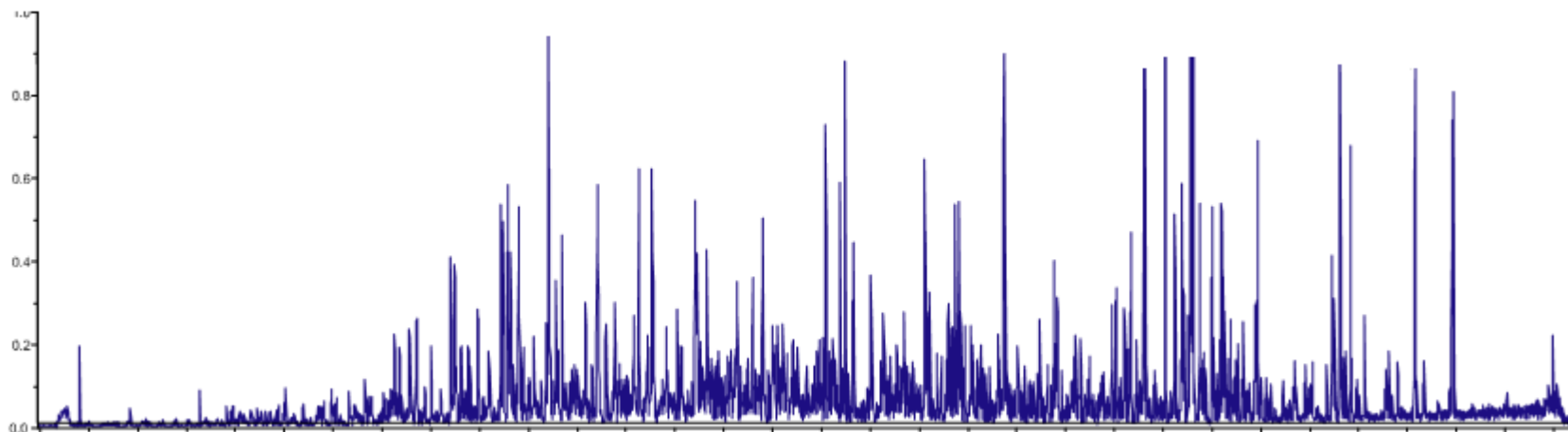
> 15 000 proteinů



~ 50 kDa → 50x 1kDa

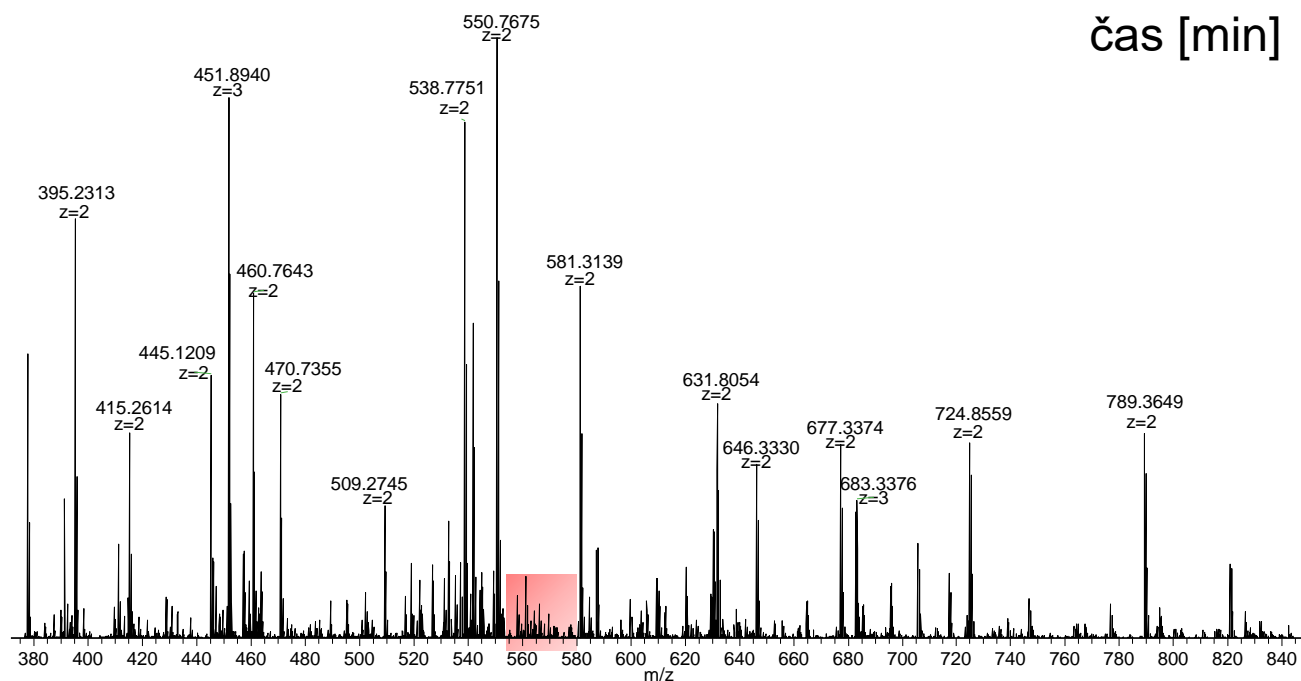


Velmi náročný analytický úkol

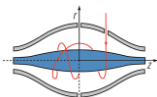
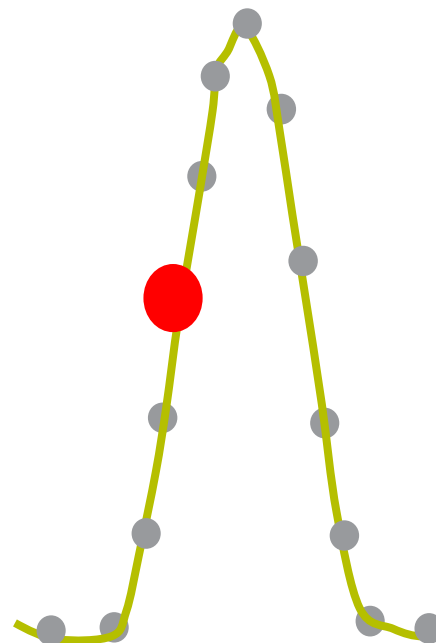


750 000 látek za 60 min
= cca 200 látek za sekundu

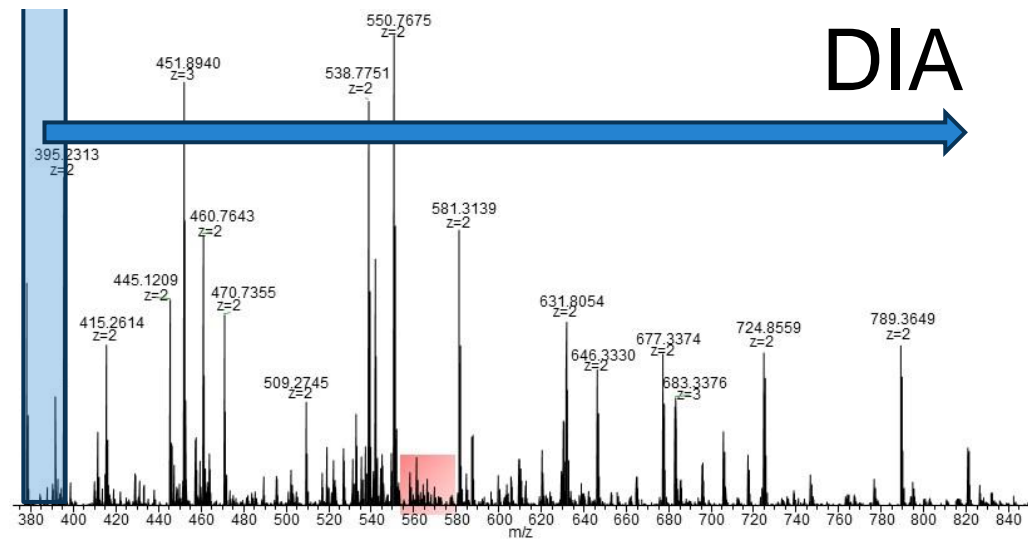
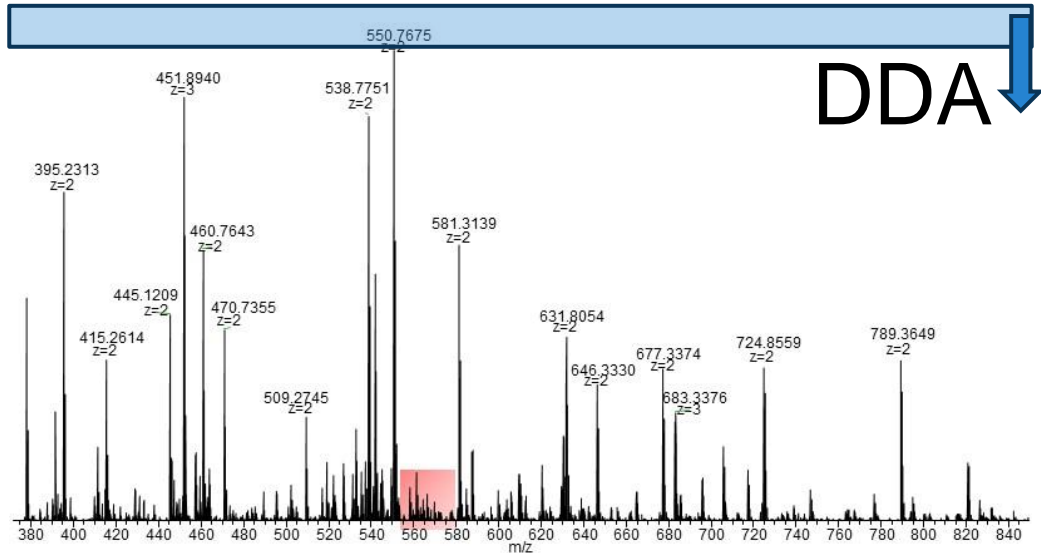
Požadavek za sekundu:
1x full scan HRMS
200 MS/MS (HRMS)



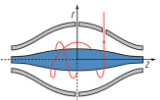
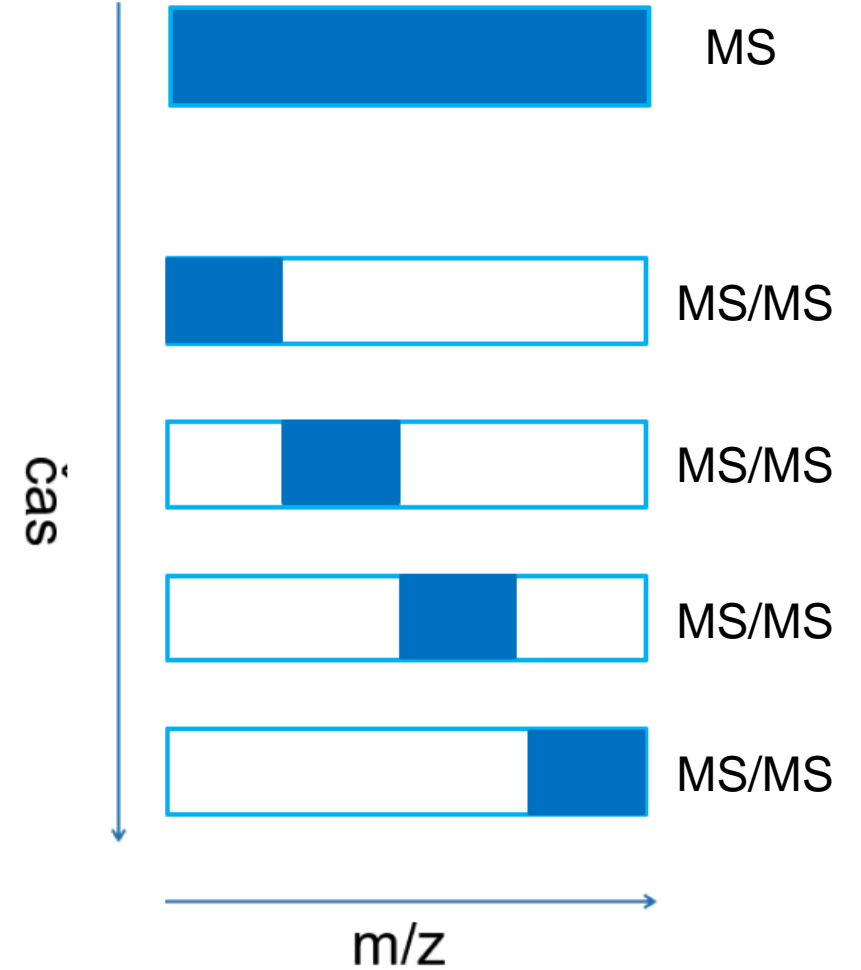
čas [min]



DDA vs. DIA



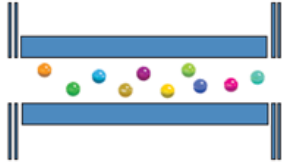
DIA může poskytnout komplexnější data (s malou šířkou izolačního okna)



Nutnost modifikace

A

Q (LRMS)

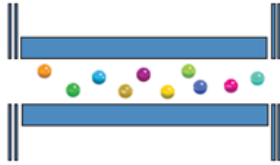


OT (HRMS)



C

Q (LRMS)



OT (HRMS)



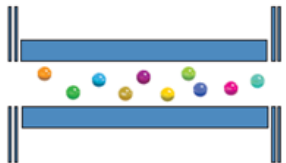
OT (HRMS)



Pub. No.: US 2019/0221410 A1
Pub. Date: Jul. 18, 2019

B

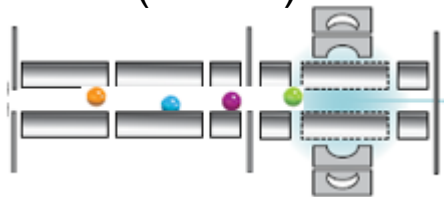
Q (LRMS)



OT (HRMS)

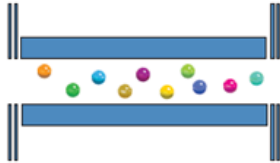


LIT (LRMS)



D

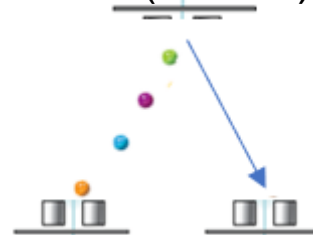
Q (LRMS)



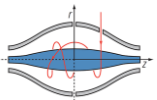
OT (HRMS)



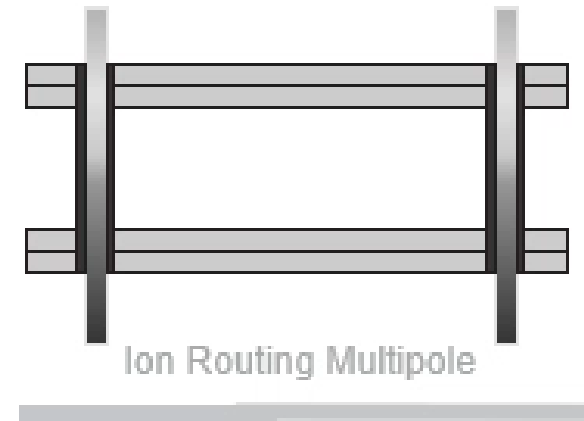
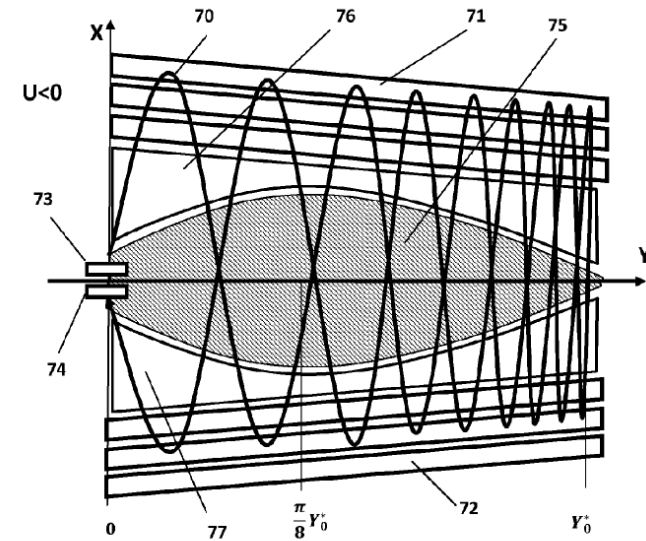
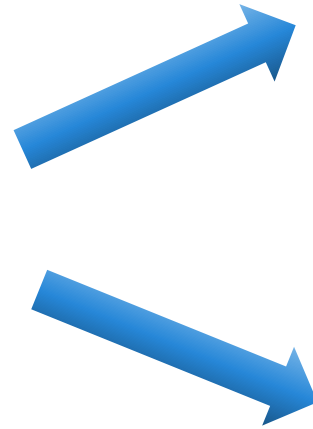
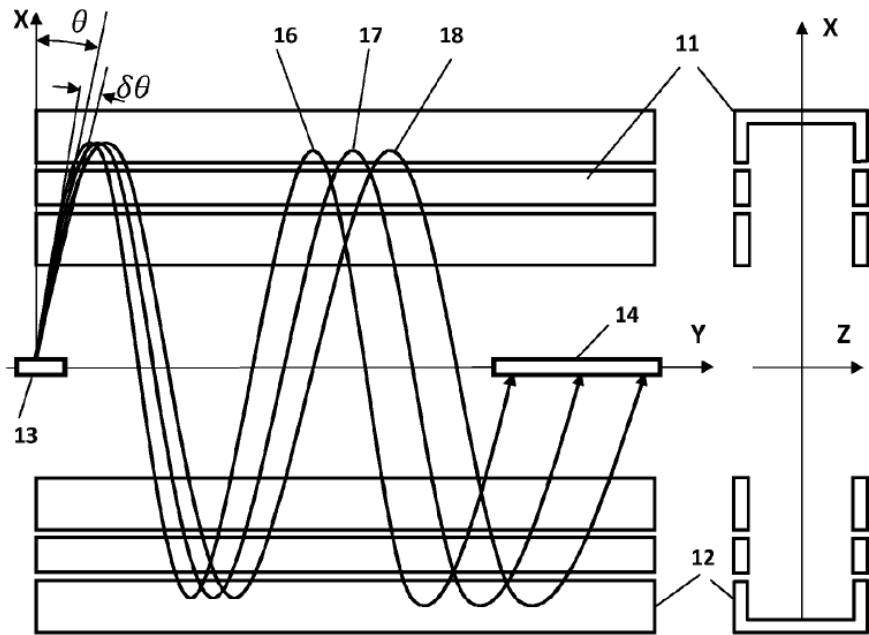
TOF (HRMS)



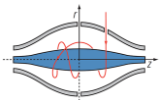
Patent No.: US 10,699,888 B2
Date of Patent: Jun. 30, 2020



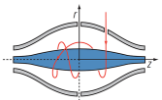
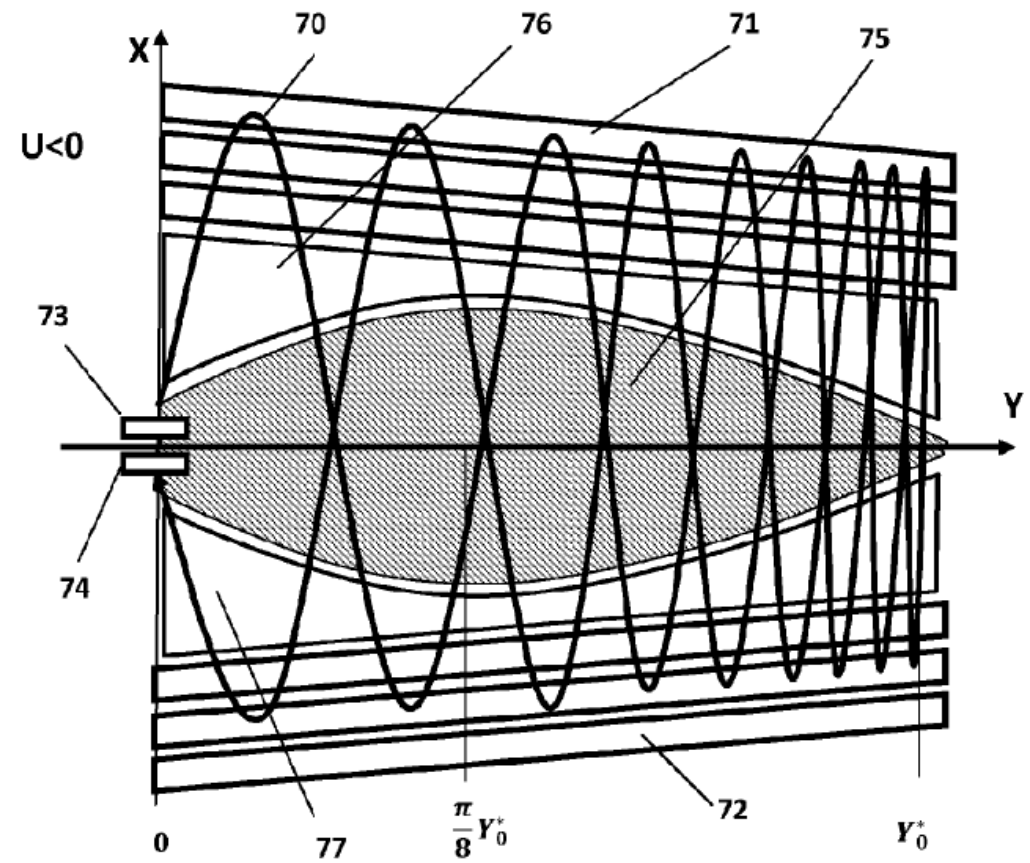
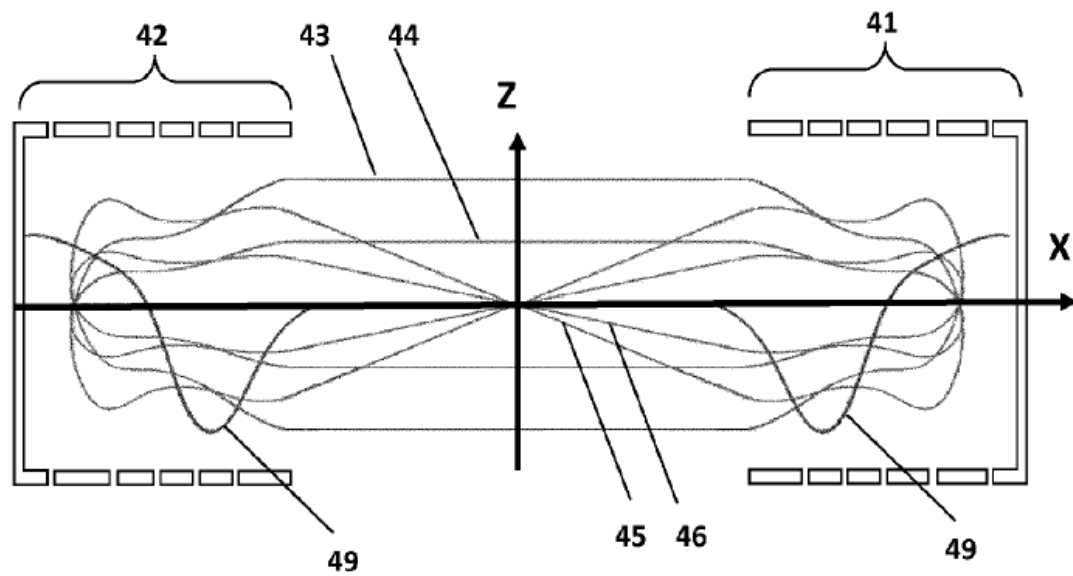
Modifikace mr-TOF



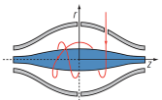
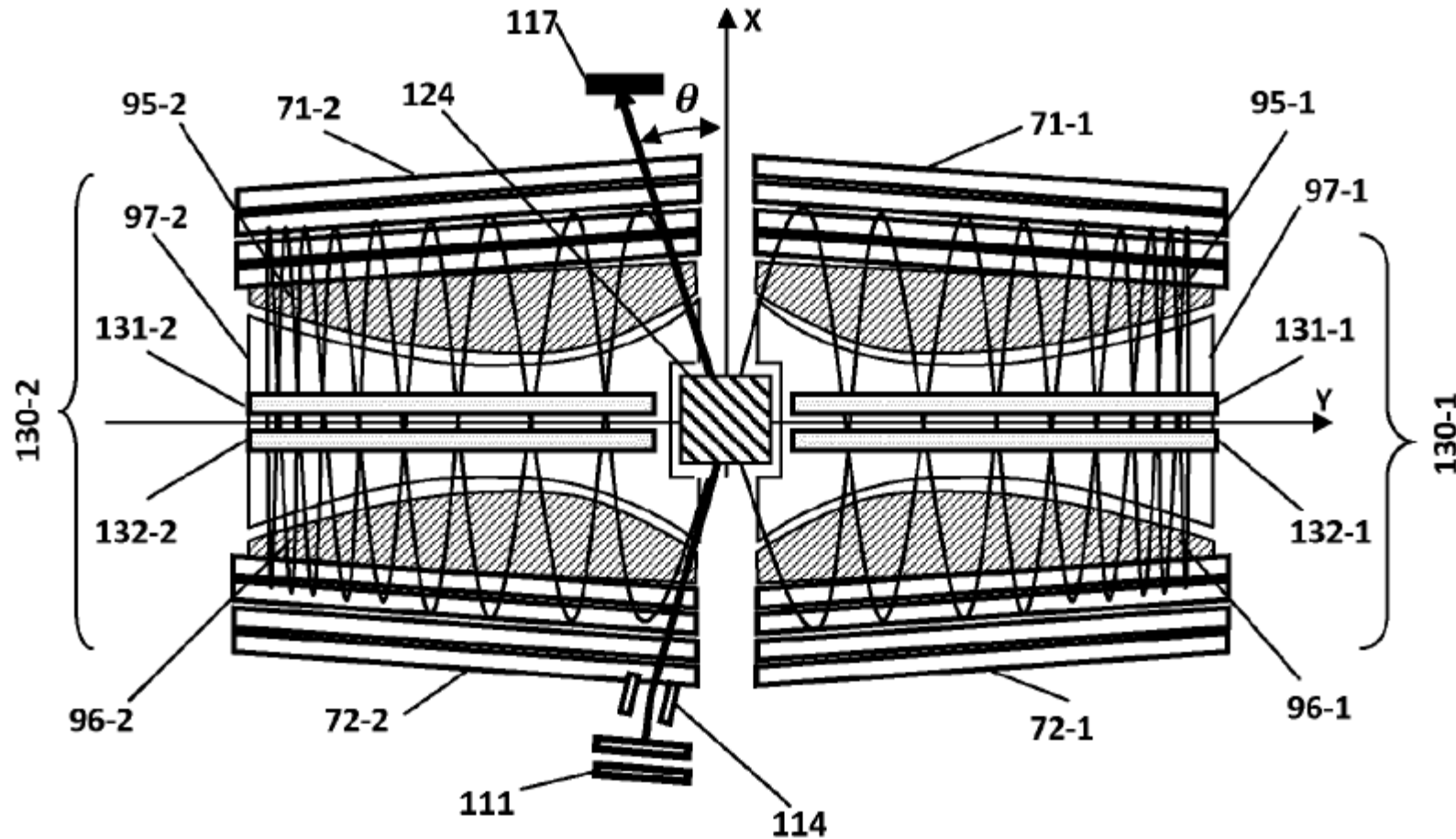
Patenty: US 9136101 B2. (15.09.2015) a US 10964520 B2. (30.03.2021)



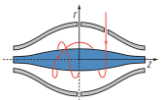
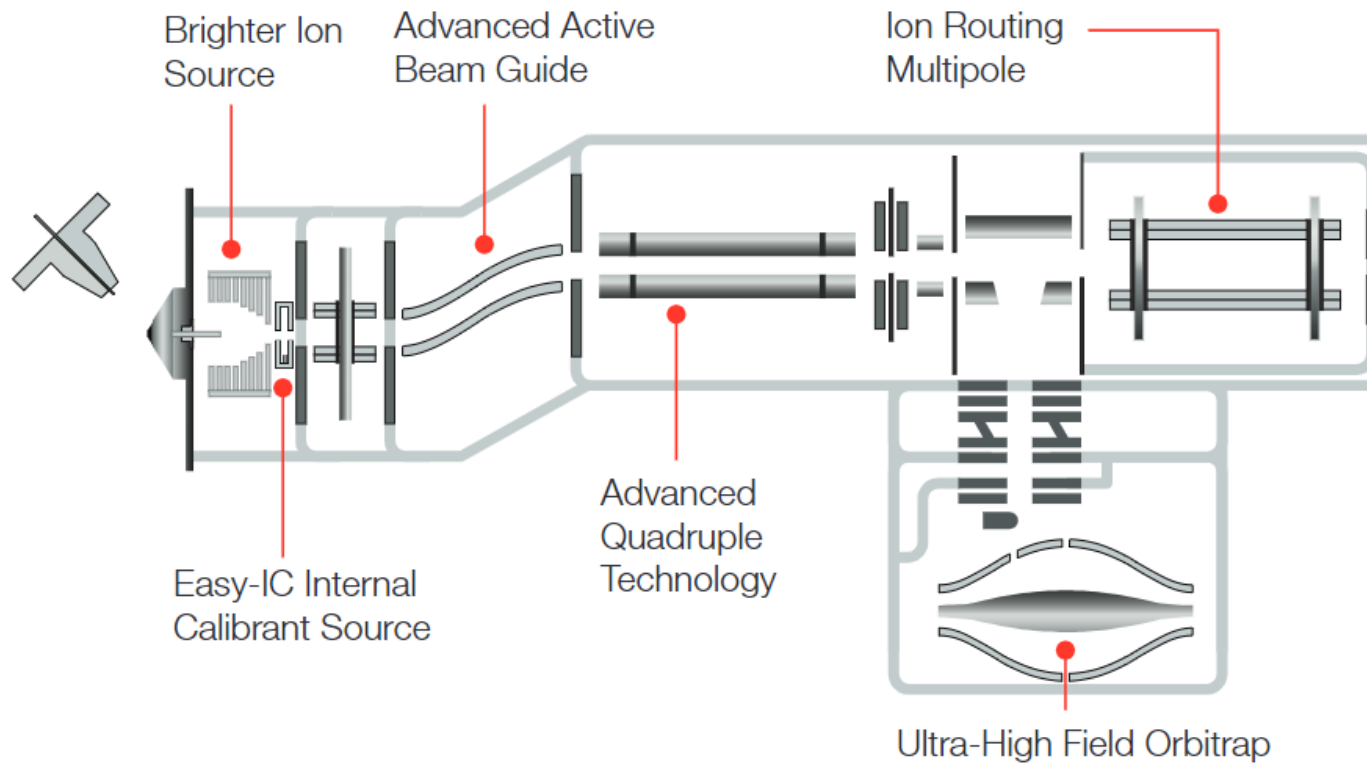
Modifikace mr-TOF



Elektrostatické pasti, další cesta?

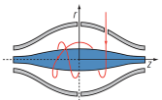
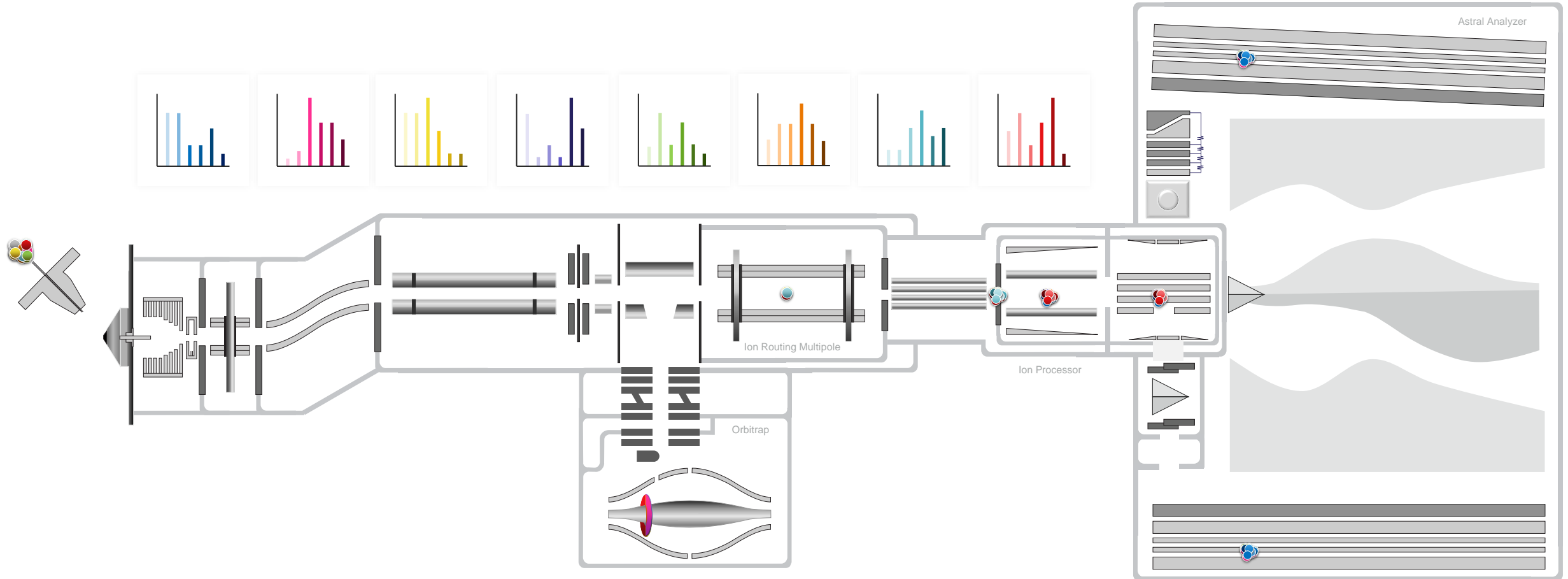


Orbitrap Astral

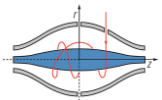
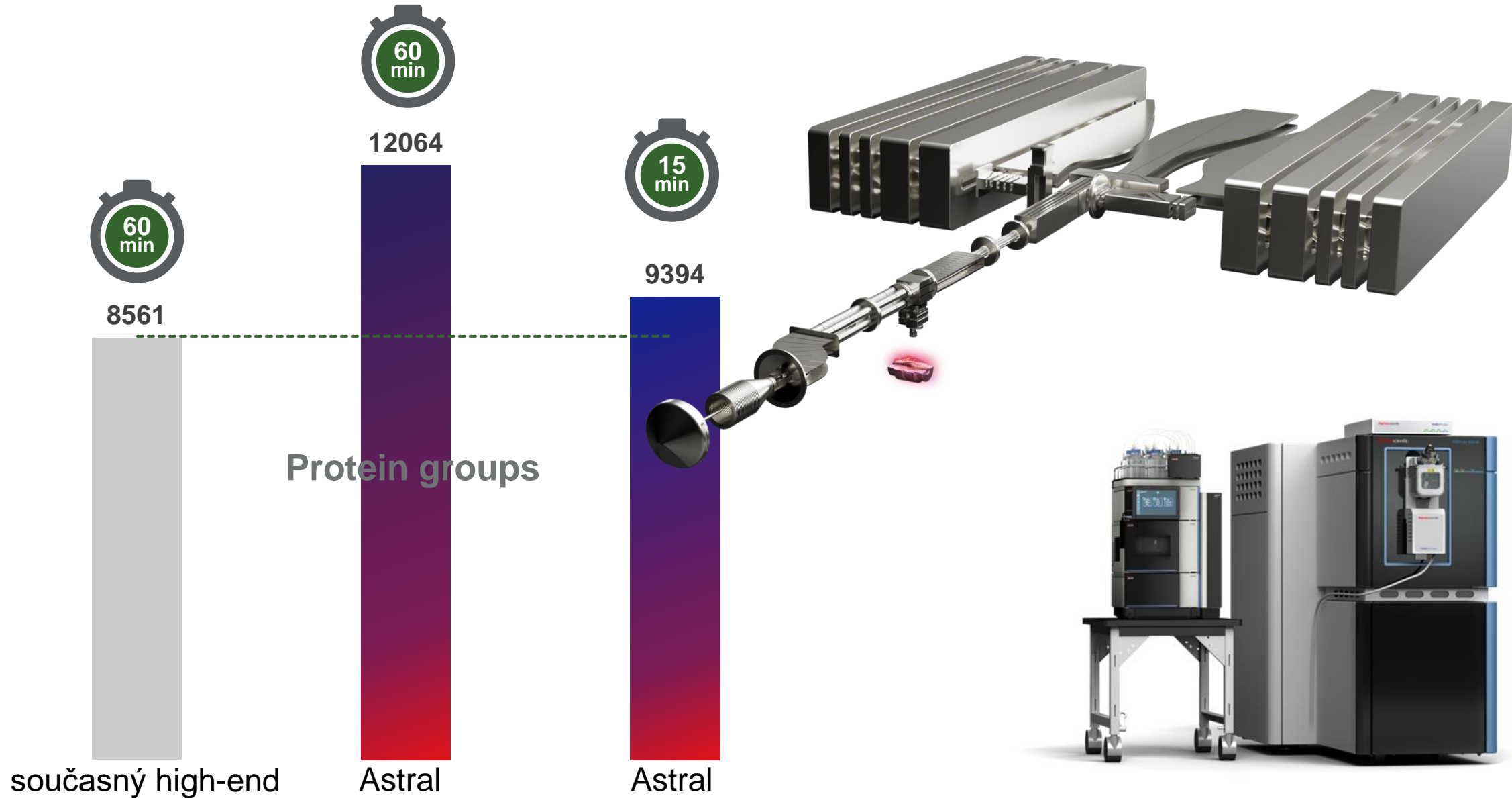


Orbitrap Astral

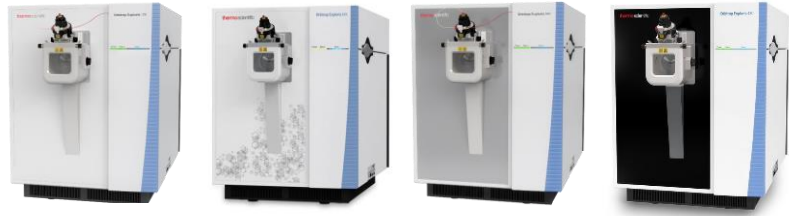
ASymmetric TRAck Lossless analyzer



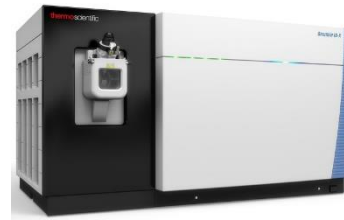
Orbitrap Astral



Současné orbitální pasti



EXPLORIS (120/MX/240/480)



IQ-X



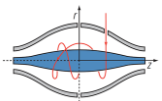
ECLIPSE

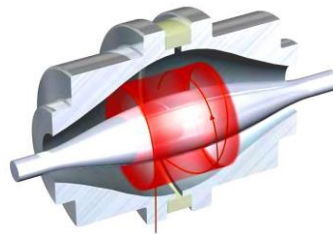


ASCEND

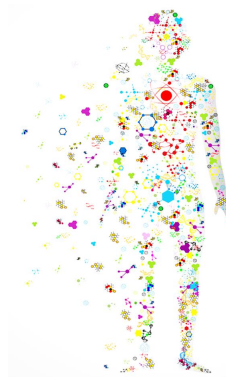


ASTRAL





potenciál k multi-analyzátorovému uspořádání HRMS
a nových typů elektrostatických pastí



www.pragolab.cz



[linkedin.com/company/pragolab-s-r-o-](https://www.linkedin.com/company/pragolab-s-r-o-)

