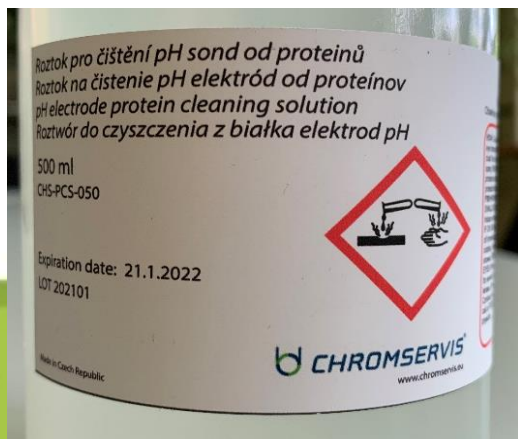


# Nové produkty firmy Chromservis



# Chromservis produkty

- Proč ?
  - Výroba a prodej vysoce kvalitních produktů, vlastní kontrola výroby
  - Nezávislost na globálním trhu a korporátních firmách
  - Individuální přístup k zákazníkům (Flat x Round bottom HS vialky)
  - Budování a posilování značky Chromservis
- Jaké produkty již nabízíme ?
  - Vialky - 2 mL, HS 10 mL a 20 mL
  - Stříkačkové filtry
  - pH elektrody (lab i proces)
  - pH pufry a další roztoky
  - Elektrochemické přístroje



# Přehled HPLC/UHPLC kolon



- Prémiová značka kolon
- Velmi náročné aplikace
- HPLC/UHPLC, Prep LC



- Stanovení Proteinů, Oligo
- Purifikace peptidů
- 300Å póry, do velikost 150 kDa

NEW



- Kvalitnější náhrada všech „SIL“ HPLC kolon
- Nové unikátní fáze / selektivity
- HPLC/ULDC



- Core-shell (SPP) částice
- Pro rychlé LC aplikace
- HPLC/UHPLC

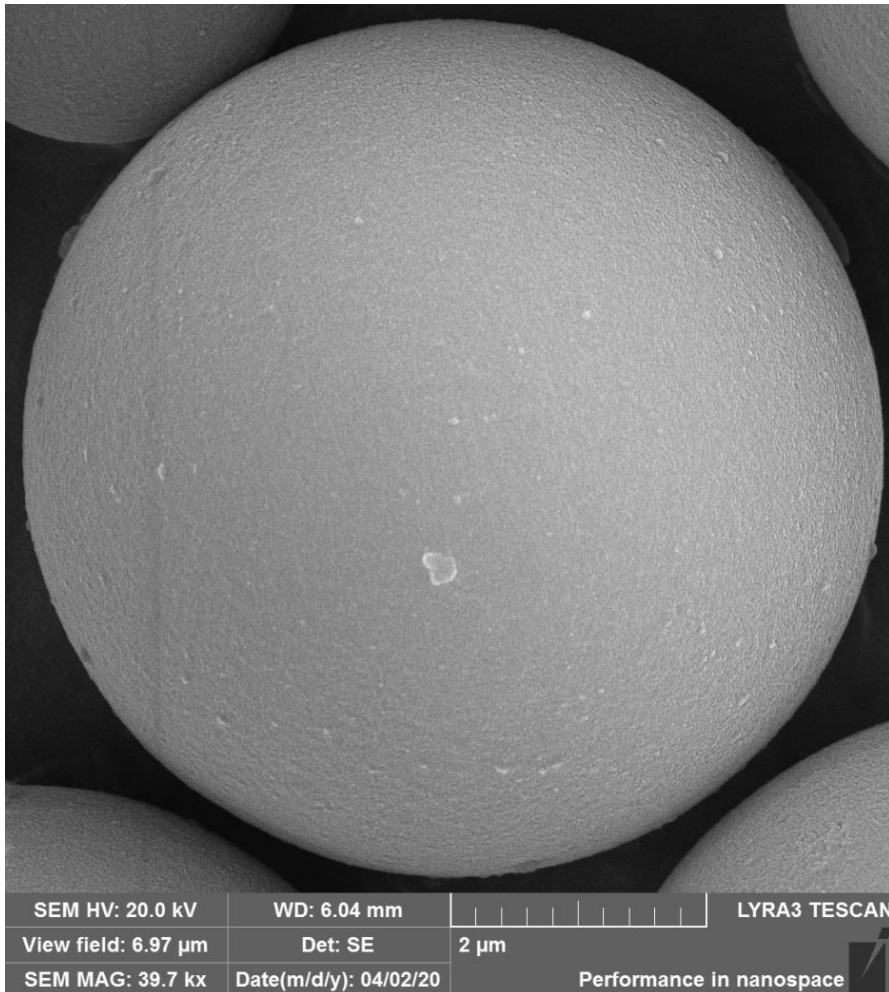


# ARION



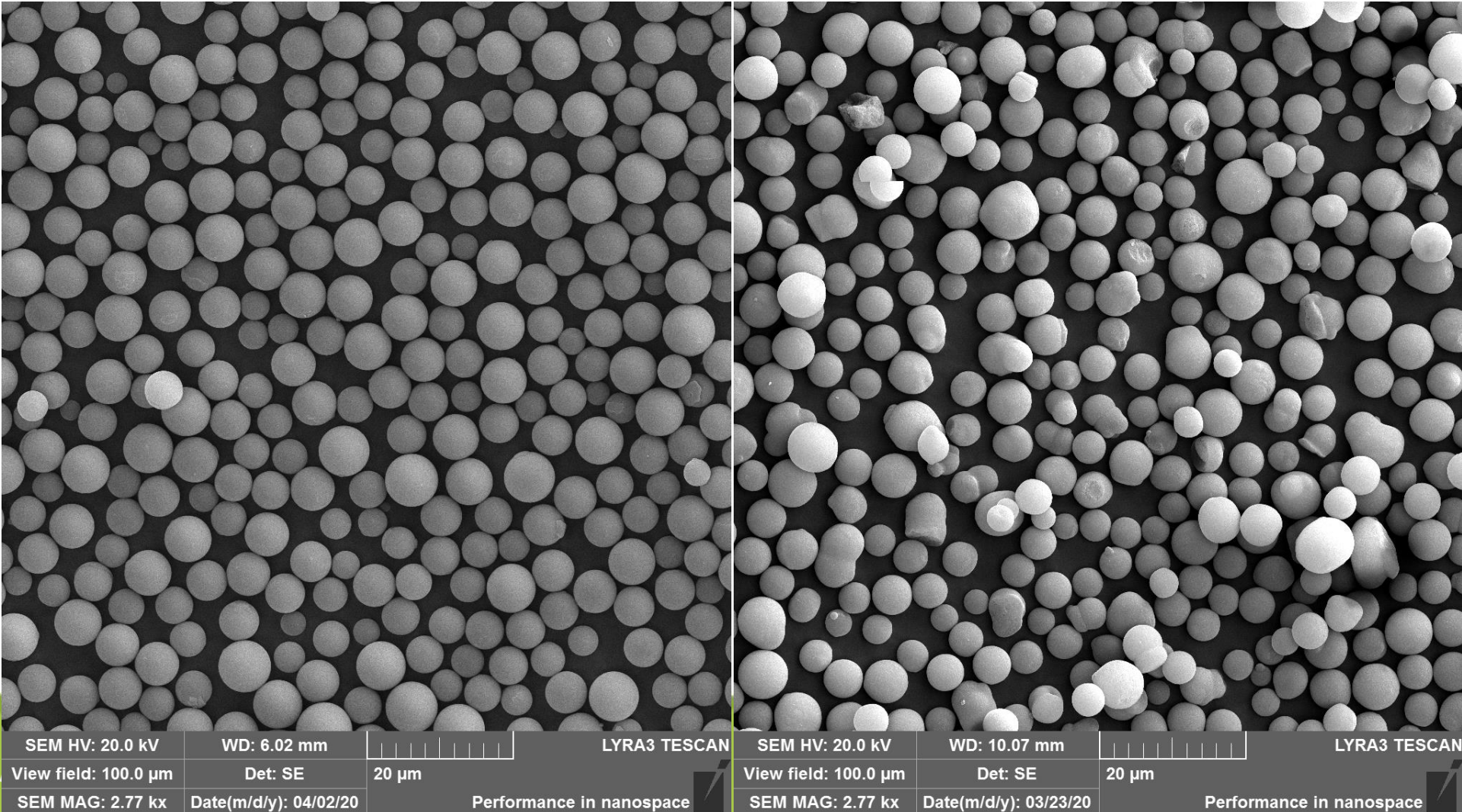
## Silikagel nejvyšší kvality a čistoty

- Velmi úzká distribuce částic a velikost pórů
- Homogenní povrch a vysoká hodnota cirkularity
- Velká plocha povrchu a obsah uhlíku (420 m<sup>2</sup>/g, 18 % C)
- Úzké QC parametry pro zajištění nejvyšší kvality výroby kolon



# Analýza velikosti částic Si pomocí SEM

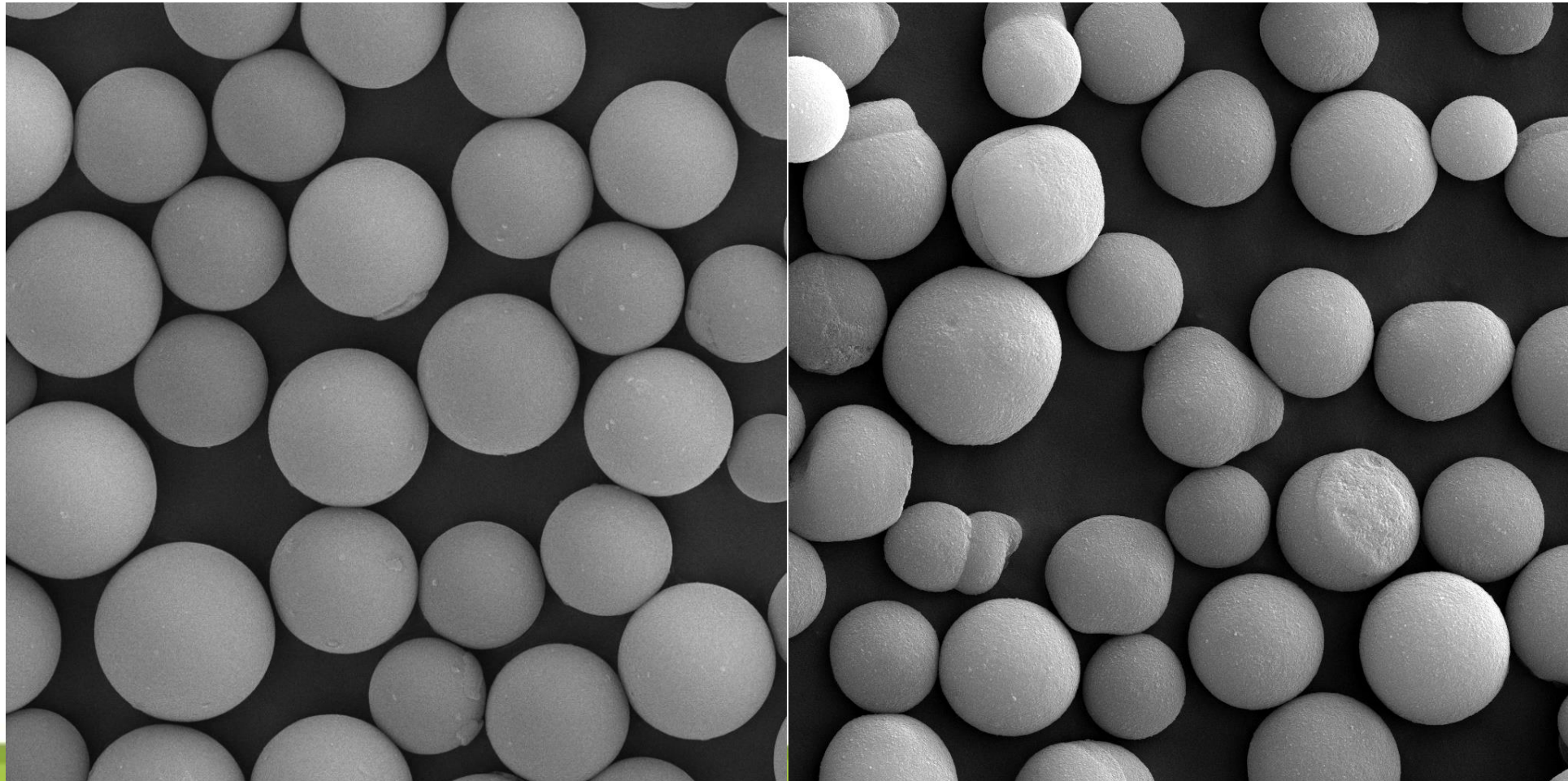
CHS Arion Plus a konkurence – výřez 100 x 100  $\mu\text{m}$






# Analýza velikosti částic Si pomocí SEM

CHS Arion Plus a konkurence – výřez 30 x 30  $\mu\text{m}$

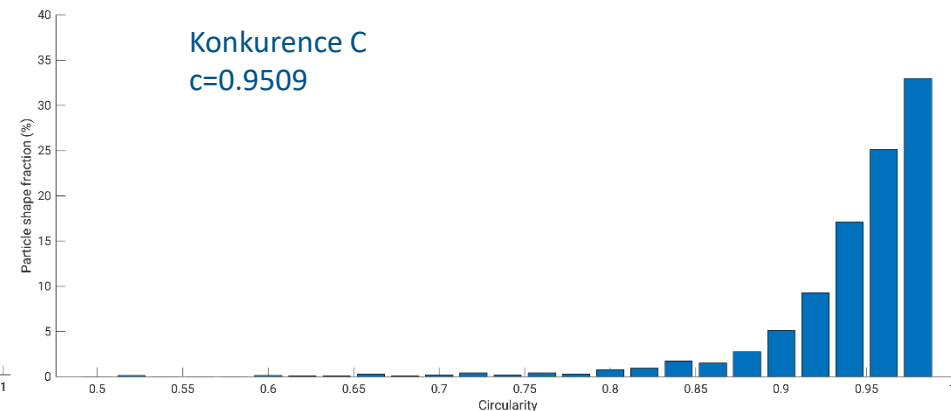
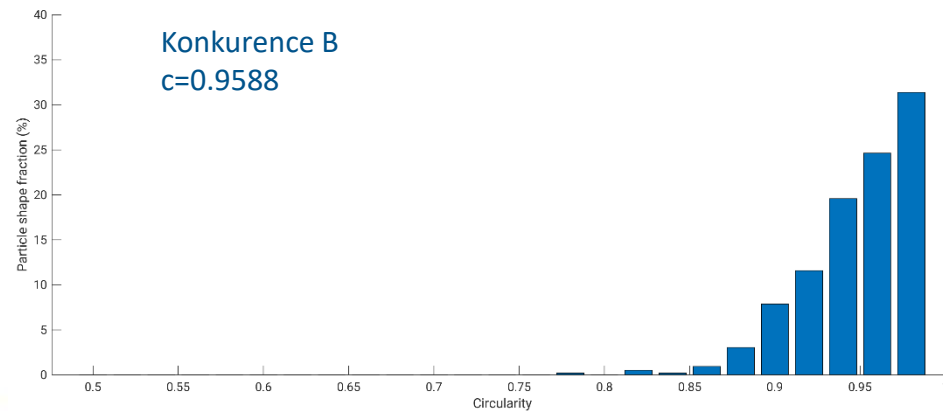
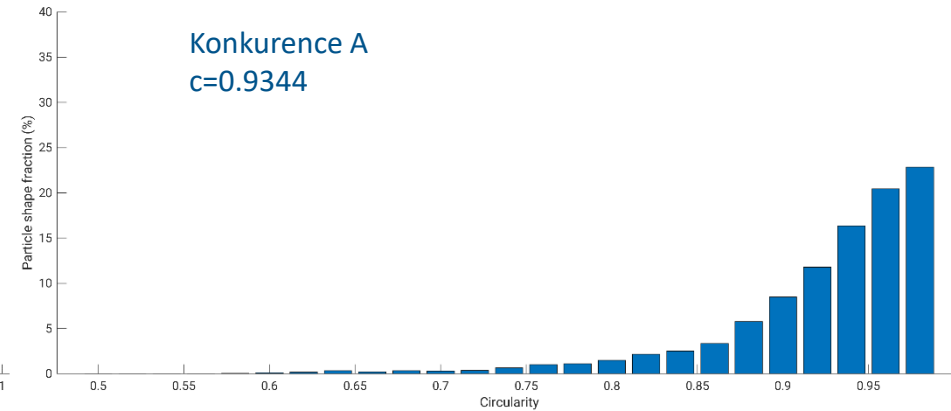
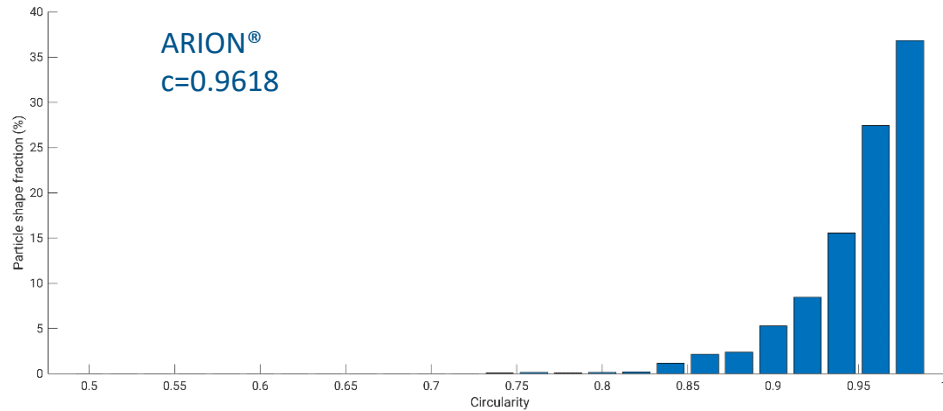


SEM HV: 20.0 kV	WD: 6.05 mm		LYRA3 TESCAN
View field: 30.0 $\mu\text{m}$	Det: SE	5 $\mu\text{m}$	
SEM MAG: 9.23 kx	Date(m/d/y): 04/02/20		Performance in nanospace

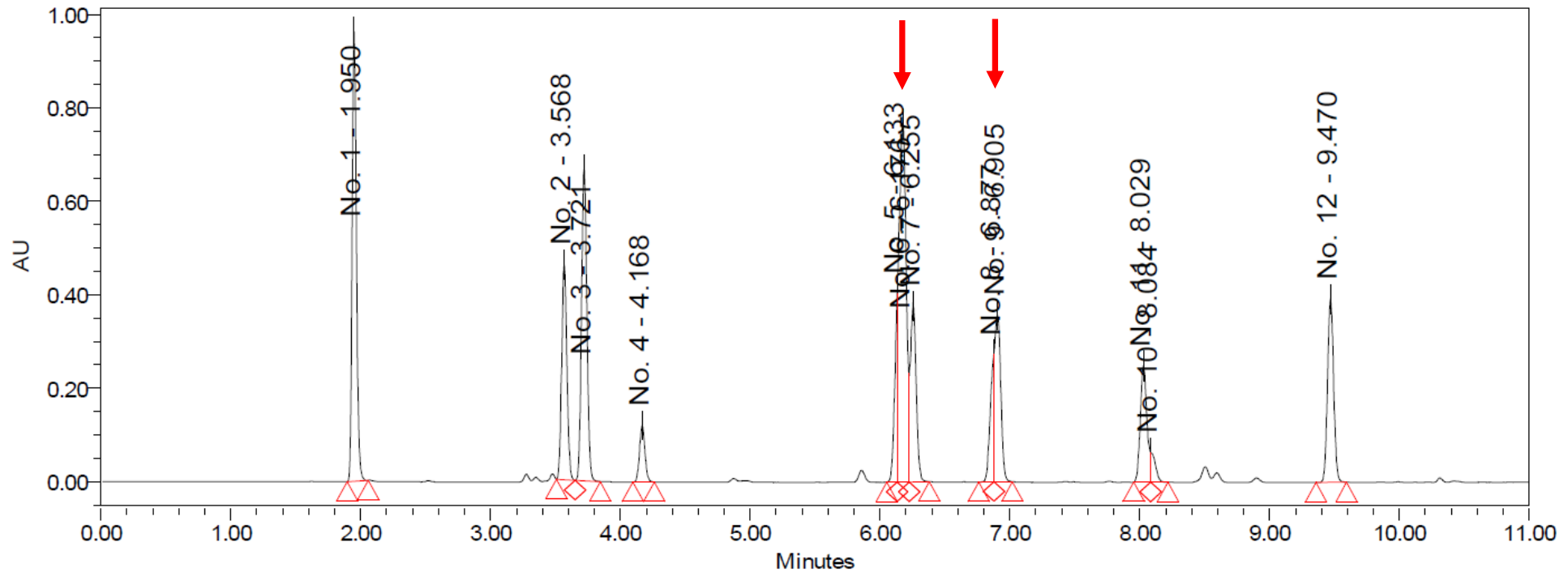
SEM HV: 20.0 kV	WD: 10.05 mm		LYRA3 TESCAN
View field: 30.0 $\mu\text{m}$	Det: SE	5 $\mu\text{m}$	
SEM MAG: 9.23 kx	Date(m/d/y): 03/23/20		Performance in nanospace

# Analýza velikosti částic Si pomocí SEM

CHS Arion Plus a konkurence A, B a C – Analýza kruhovitosti částic ve všech vzorcích.



## Stanovení nečistot - farmacie

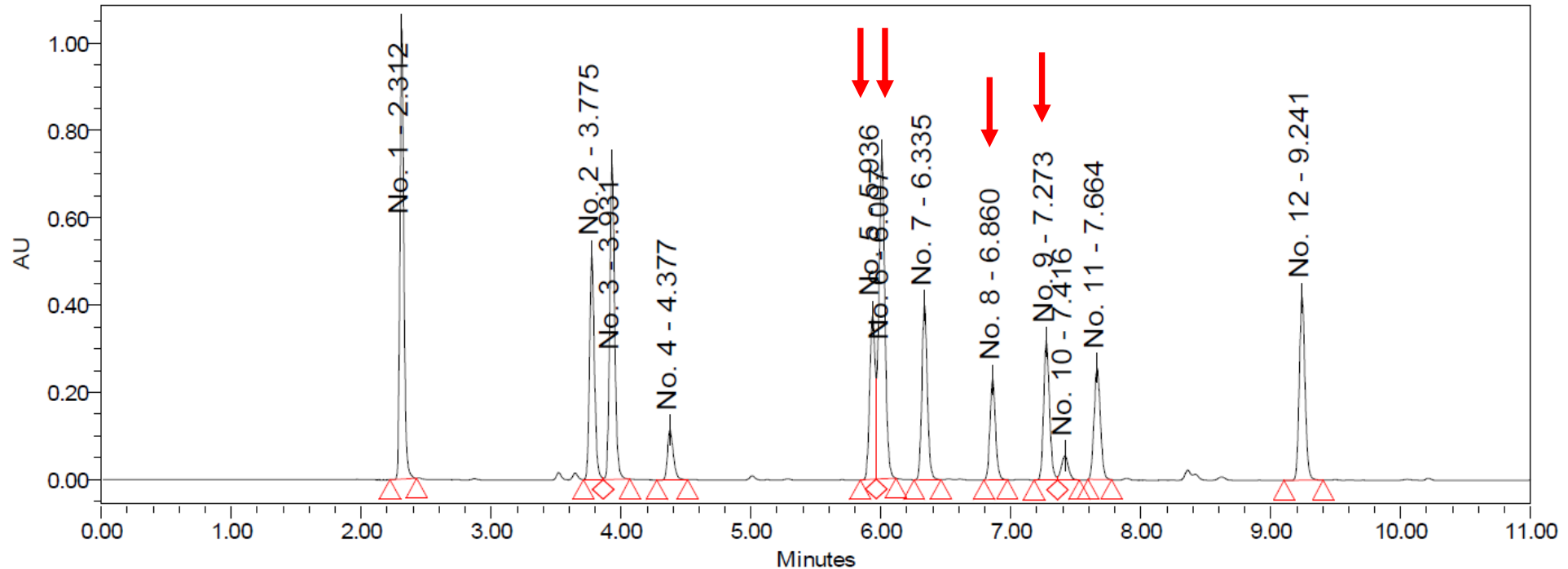


Konkurenční kolona, 3  $\mu$ m, 150 x 4.6 mm

Peaks 5 - 6 and 8 - 9 are fluoro and des fluoro substances, which are generally poorly separated.  
Previously used column



# Stanovení nečistot - farmacie

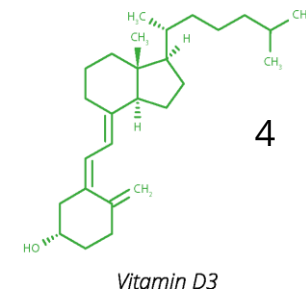
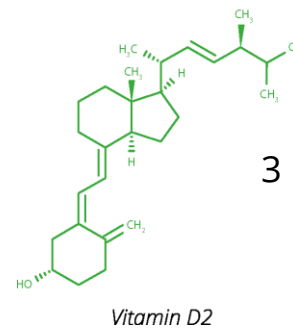
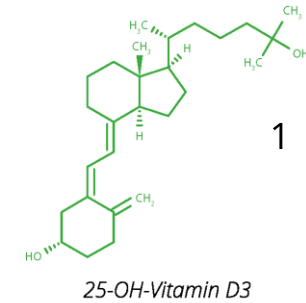
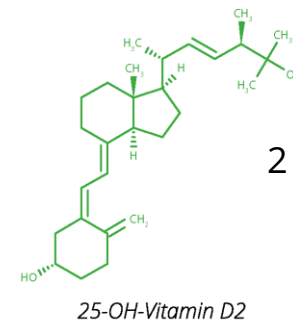
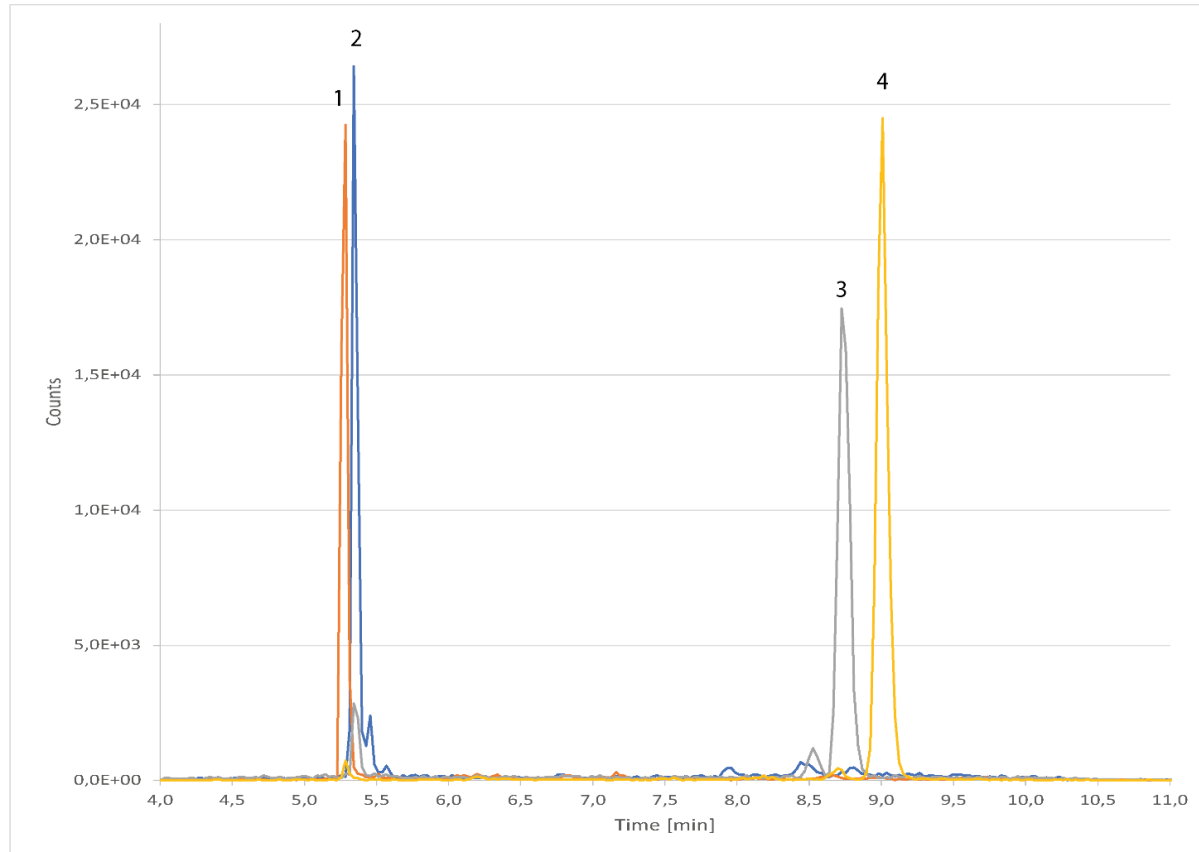


— Sample Name Mix, Arion C18, 3um, 150x4.6; Result Id 1868

Peaks 5 - 6 and 8 - 9 are fluoro and des fluoro substances, which are generally poorly separated. However, the Arion Plus C18 column is able to separate them

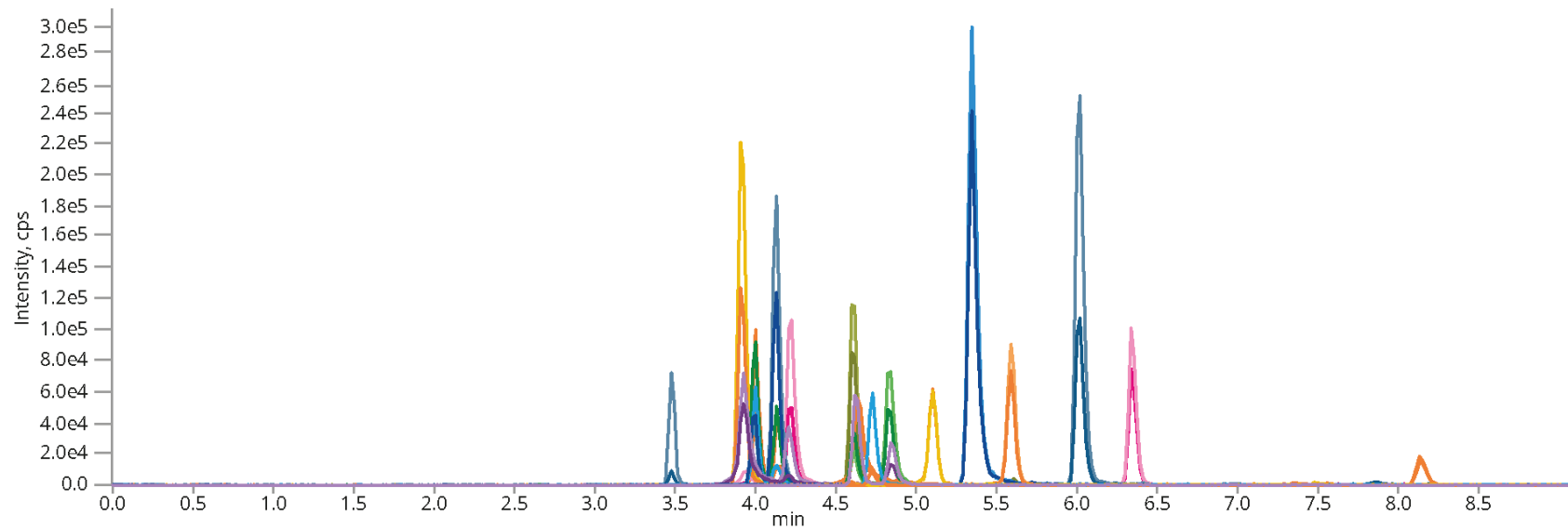
# Vitamín D v krevních skvrnách

Vitamin D in dry blood spot



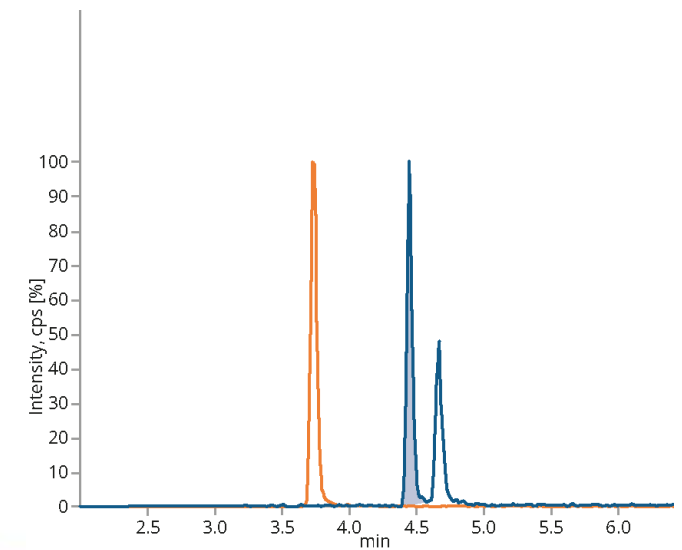
# Stanovení opiátů a tramadolu

Opioids and Tramadol and their metabolites by LC/MS



21 analytes

- Codeine
- Morphine
- 6-o-Acetylmorphine
- 6-Monoacetylmorphine
- Morphine-6-glucuronide
- Buprenorphine
- ...



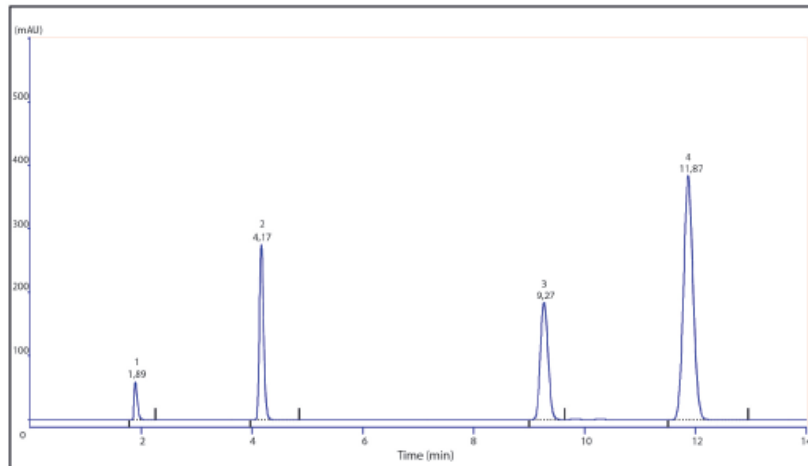


# Porovnání s konkurencí

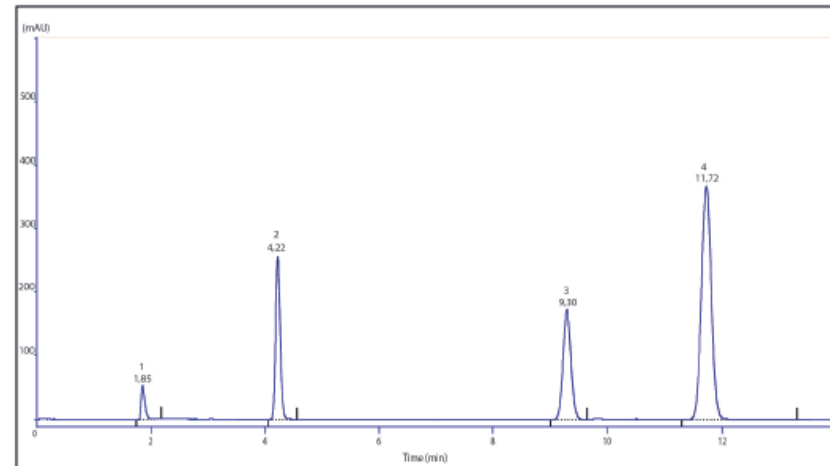
Material Characteristic		
Arion® Plus C18		Luna® C18 (2)
1.7, 2.2, 3.0, 5.0	Particle Size (µm)	2.5, 3.0, 5.0
100	Pore Size (Å)	100
420	Surface Area (m <sup>2</sup> /g)	400
18	Carbon Load (%)	17.5
1.0 - 10	pH range	1.5 - 9*

\* pH range is 1.5 - 9 under gradient conditions, pH 1.5 - 10 under isocratic conditions

### Arion® Plus C18



### Luna® C18 (2)



Comparative analysis were performed on a standard mixture ARI-MIX-1

## Co je nyní v nabídce ??

### ARION® Silicagel

Metal content	<10 ppm
Temperature stability	100 °C*
Mean particle diameter	5.3±0.9 µm
Proximity to the shape of circle	0.96±0.04

ARION® phases	Particle size (µm)	Pore size (Å)	Surface area (m <sup>2</sup> /g)	Carbon load	pH stability	Endcapping	100% aqueous mobile phase	USP code
Plus C18	1.7, 2.2, 3, 5, 10, 15	100	420	18 %	1.0 to 10	Multi-step	×	L1
Polar C18*	2.2, 3, 5, 10, 15	120	325	16 %	1.5 to 7	Multi-step	✓	L1
C8	3, 5	120	325	11 %	2.0 to 7	Single-step	×	L7
Biphenyl	5	100	325	12 %	2.0 to 7.5	Proprietary	✓	L11
Phenyl-Butyl	2.2, 3, 5	100	300	12 %	1.5 to 7.5	Single-step	×	L11
NH <sub>2</sub>	2.2, 3, 5	120	325	5 %	2.0 to 6.5	Proprietary	×	L8
CN	3, 5, 10	120	325	8 %	2.0 to 7	Single-step	×	L10
HILIC Plus	2.2, 3, 5	100	420	-	1.5 to 7	Proprietary	✓	L3
Si	2.2, 3, 5, 10	100	420	-	1.5 to 7	-	×	L3
SAX	5	120	325	-	1.0 to 7.5	-	×	L14
SCX	5	120	325	-	1.0 to 7.5	-	×	L50

## Proč Astra®



### Cílem je:

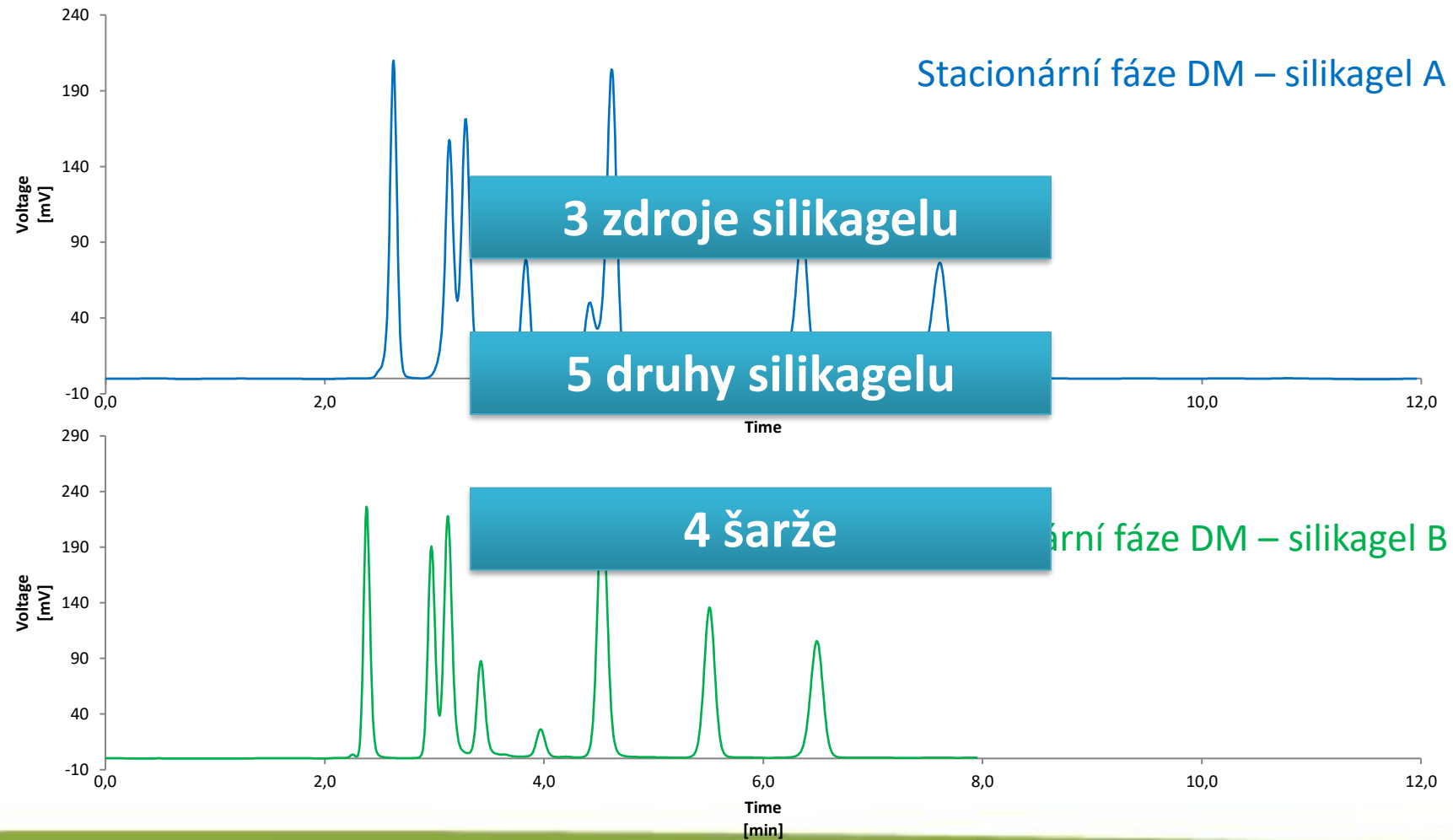
- Úplná kontrola nad výrobou a surovinami, vlastní „Know-How“
- Nezávislost na globálních firmách
  - Nebylo jich málo, se kterými máme špatné zkušenosti...
- Navázat na tradice československé chromatografie



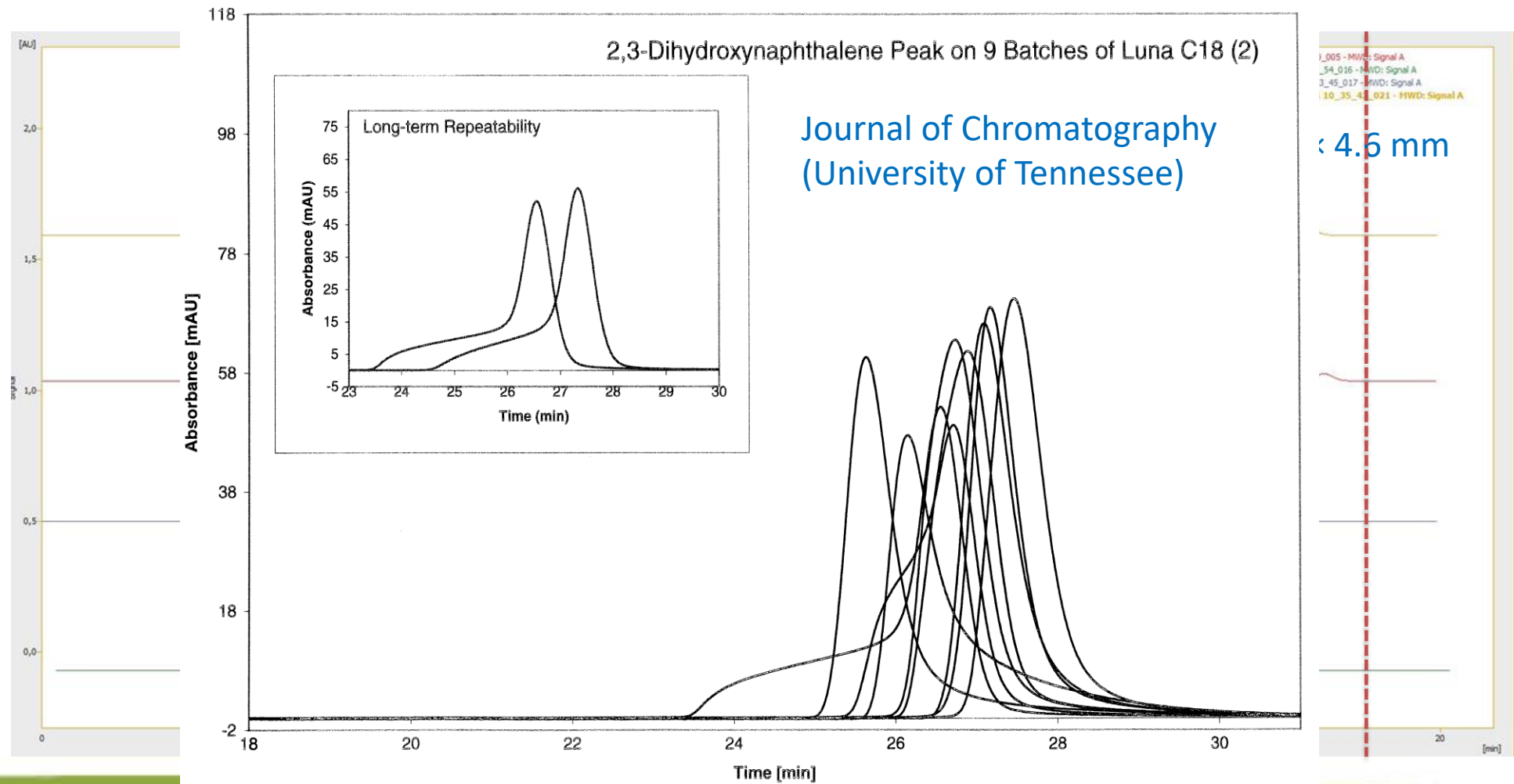




# Astra® - výběr silikagelu

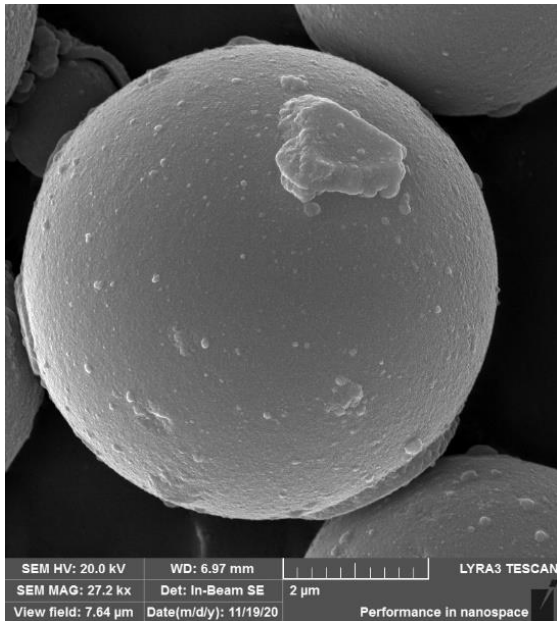


## Astra® - kontrola šarží

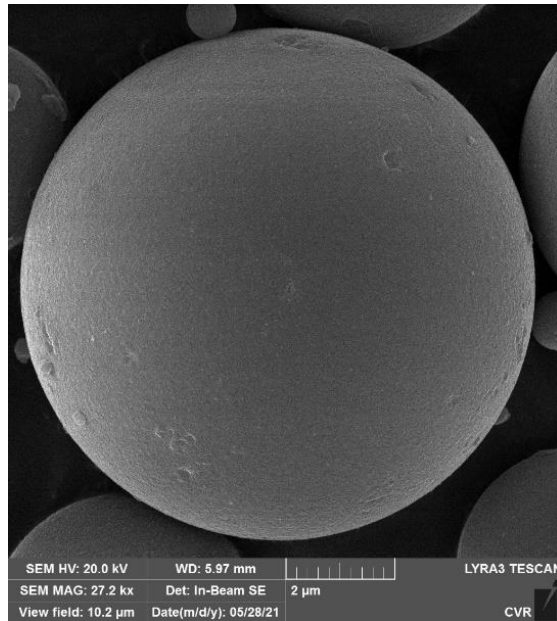




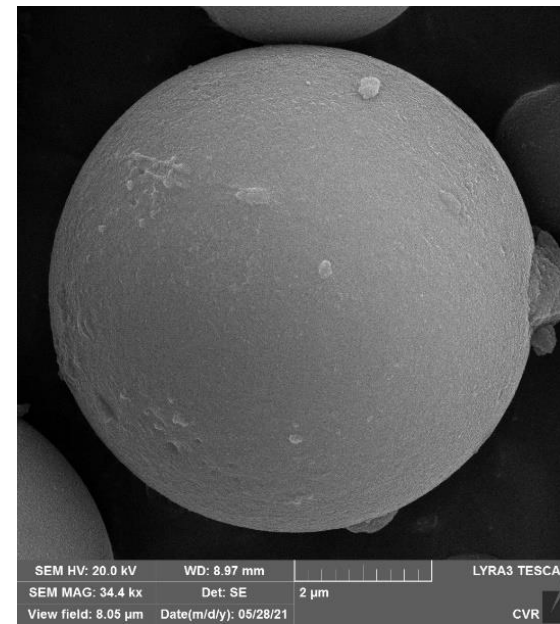
# Astra<sup>®</sup> - kontrola plnění pomocí SEM



Před plněním

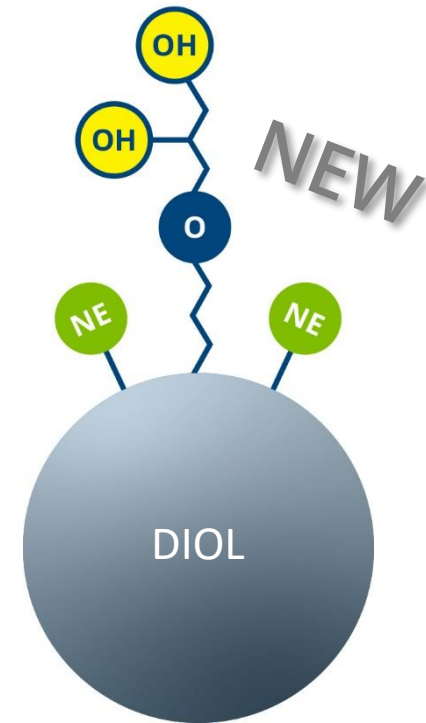
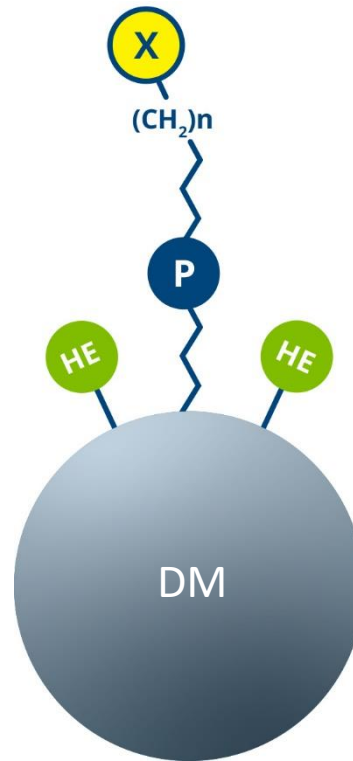
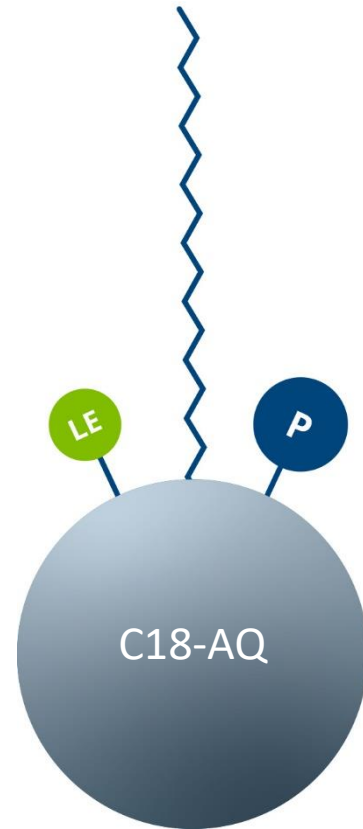
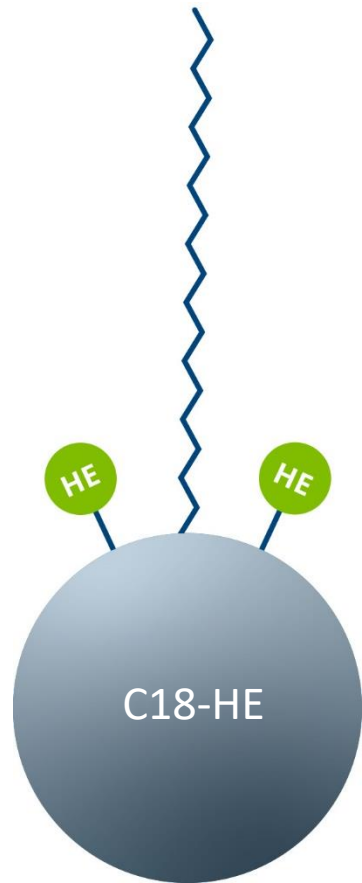


Po naplnění



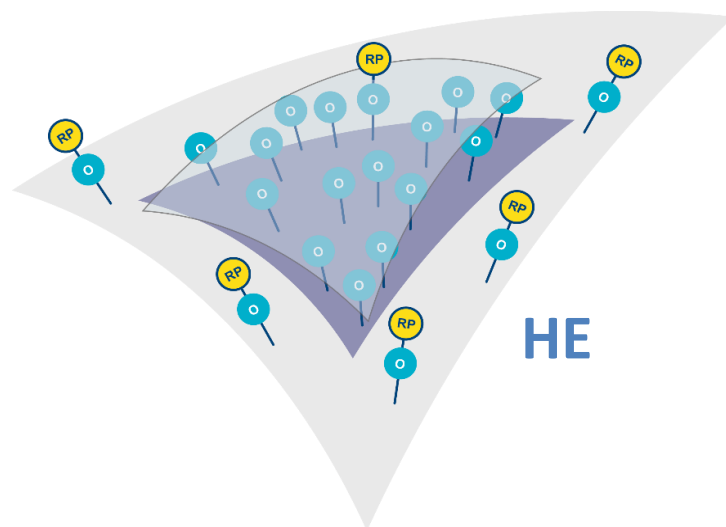
Po stresování  
vysokým tlakem

# Astra<sup>®</sup> fáze

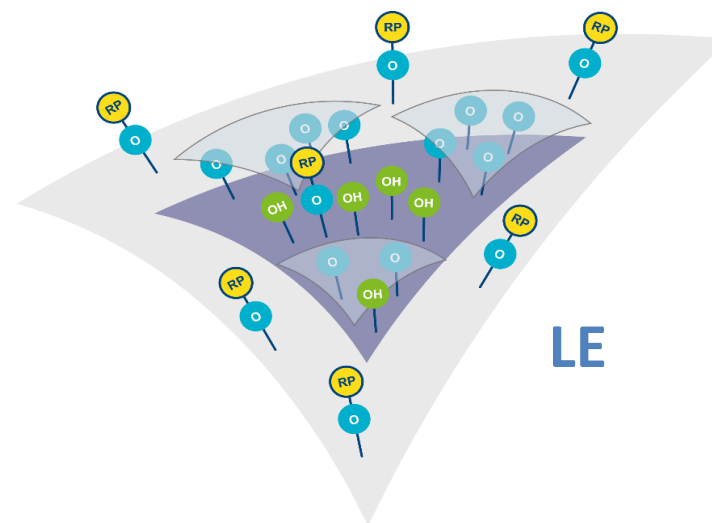


# Astra® End-capping

ASTRA

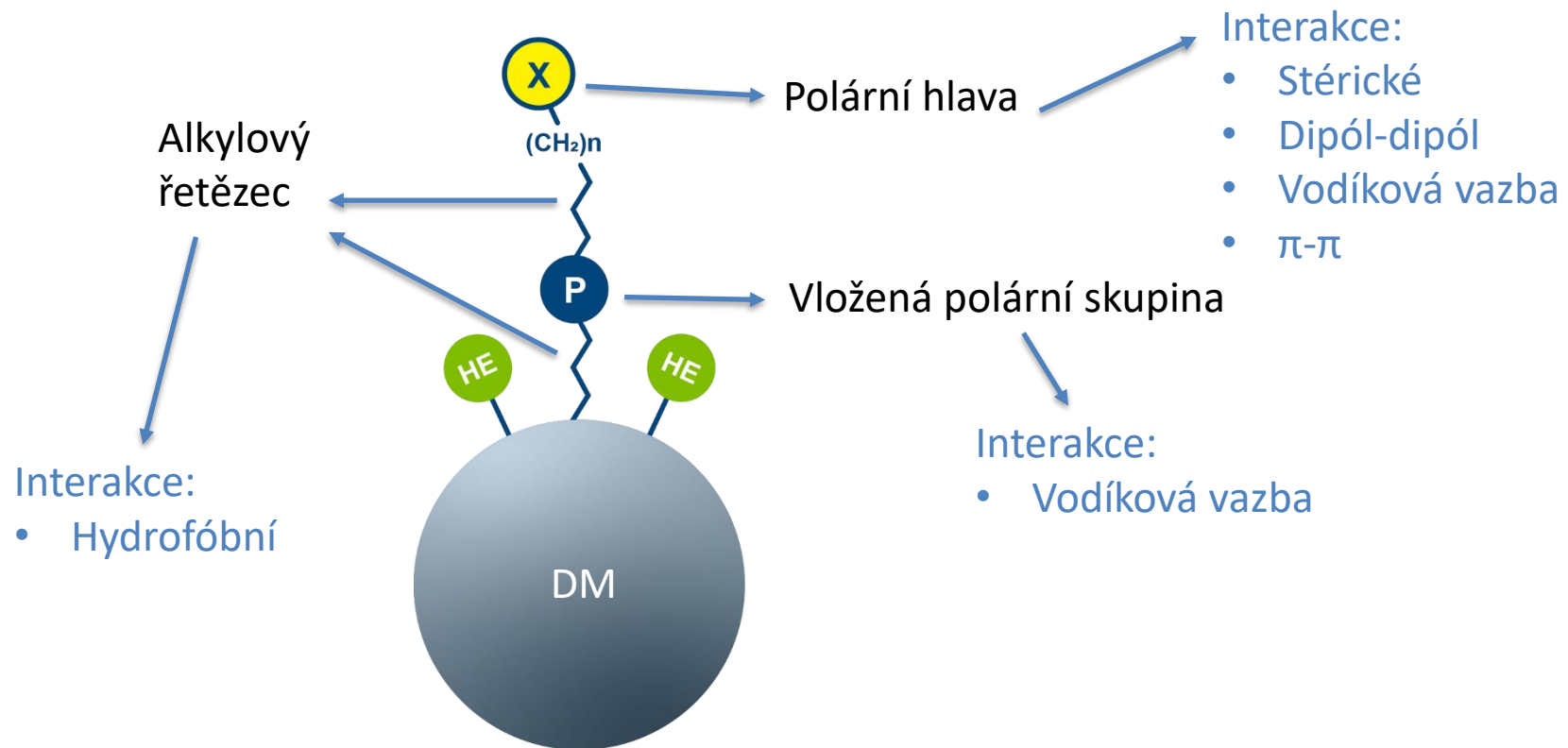


- High End-capping
- >99% efficiency
- Suitable for hydrophobic chemistries



- Low End-capping
- <50% efficiency
- Used in special chemistries

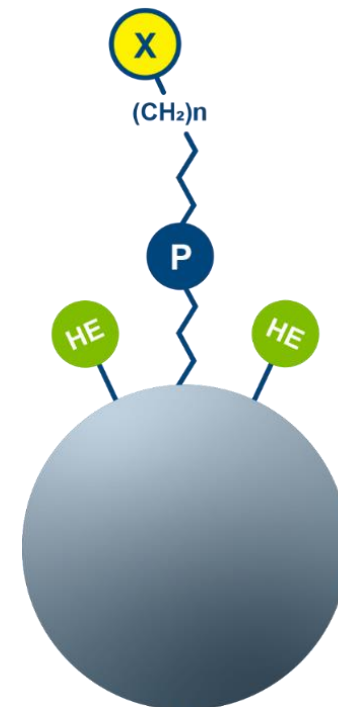
# Vlastnosti ASTRA<sup>®</sup> DM



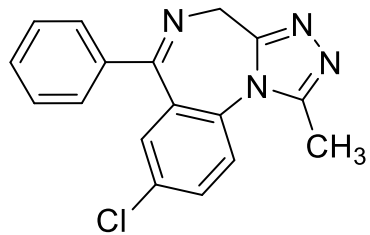


## Vývoj metody na Astra<sup>®</sup> DM

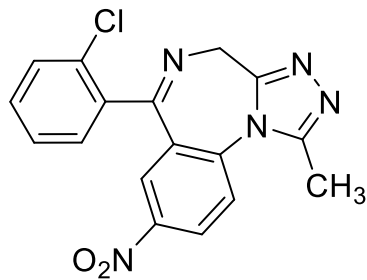
- Doporučeno pro:
  - Polární sloučeniny
  - Aromatické látky (s požadavky na sterickou selektivitu)
  - Aminy
- Mobilní fáze:
  - Neutrální, pH od 3 do 4 nebo  $\geq 7$ 
    - pH pod 3 může vyžadovat přesnou hodnotu pufr v MF, méně robustní
  - Modifikátory
    - Voda/methanol s HCOOH + 2 mM HCOONH<sub>4</sub>
    - 100 mM DEA, HCOOH



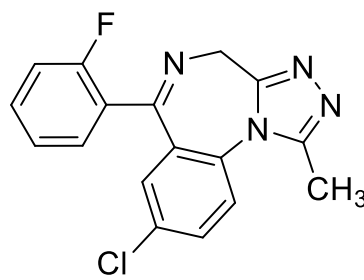
## Případová studie VŠCHT Praha



Alprazolam



Clonazolam

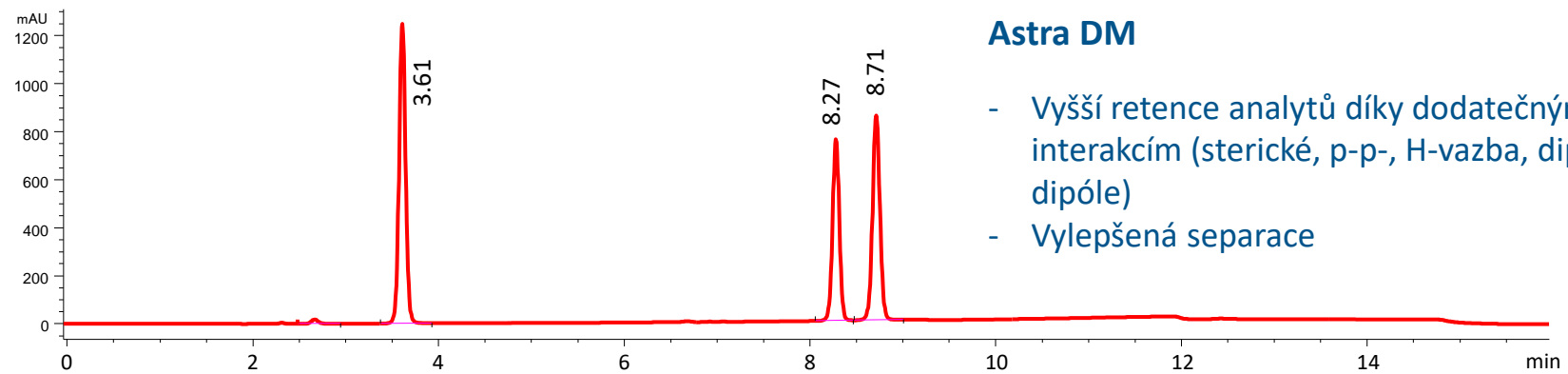
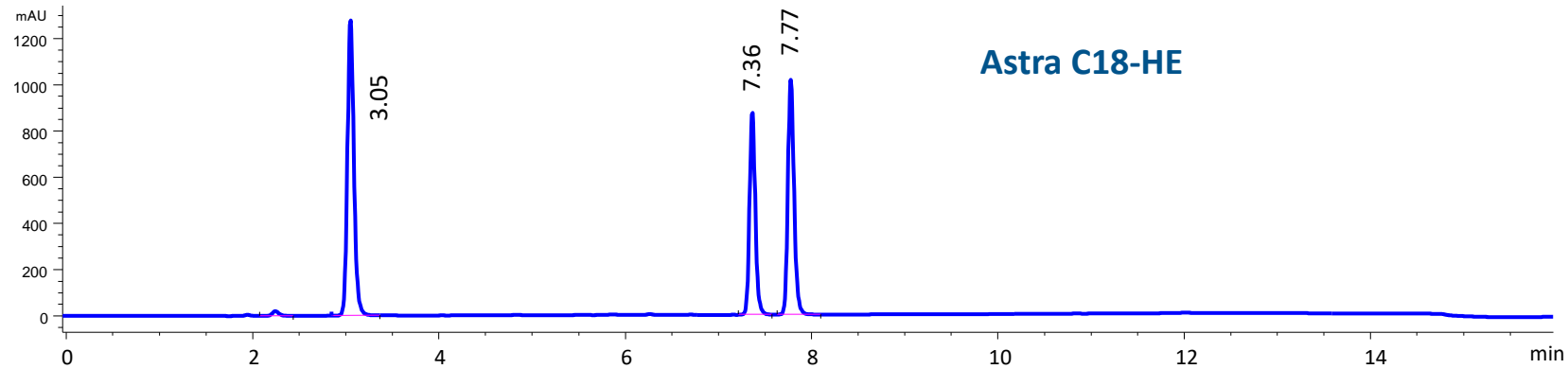


Flualprazolam



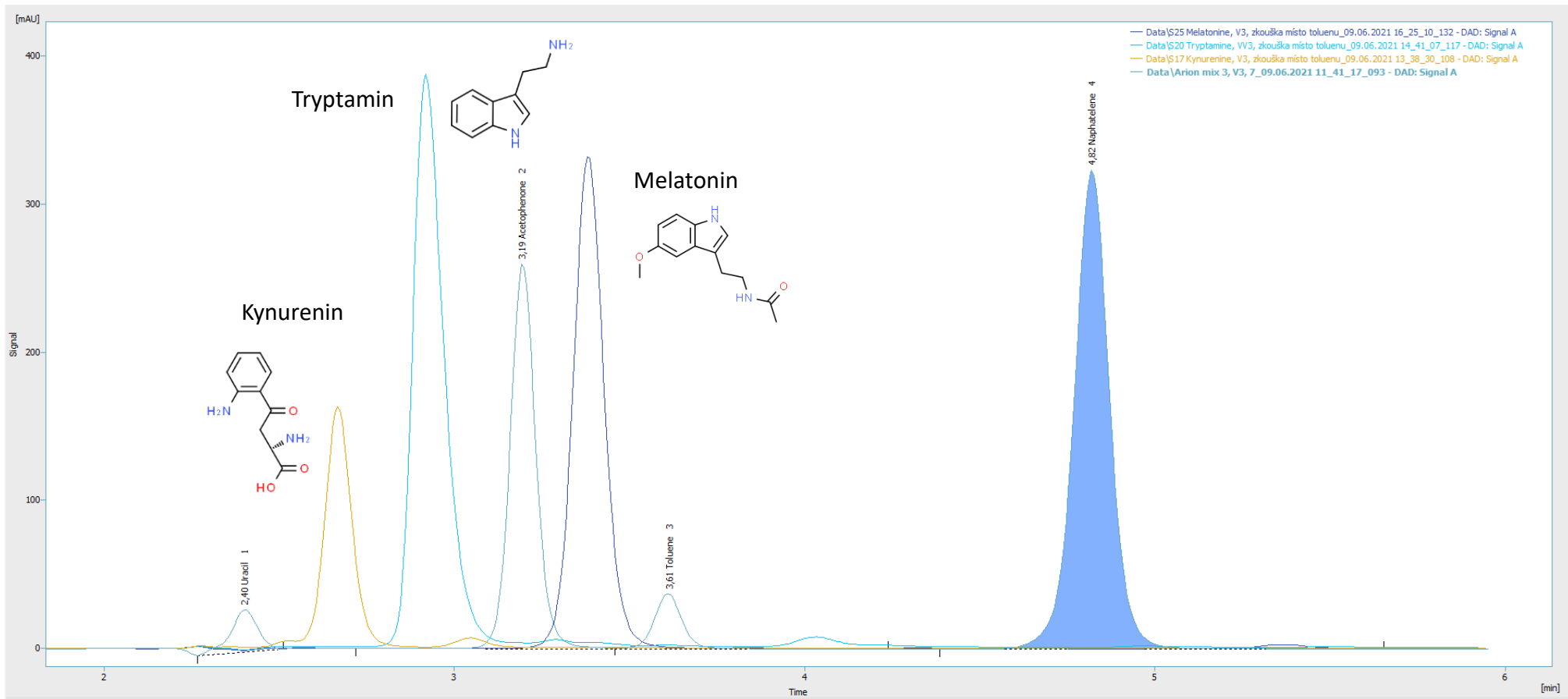
- Alprazolam / Xanax – je anxiolytická látka patřící mezi benzodiazepiny (léčba a odstranění strachu a úzkosti)
- Padělky mohou obsahovat Clonazolam a Flualprazolam, obojí má silný sedativní účinek, může způsobit ztrátu paměti a patří mezi nové psychoaktivní látky

# Případová studie VŠCHT - výsledek



- Vyšší retence analytů díky dodatečným interakcím (sterické, p-p-, H-vazba, dipól-dipóle)
- Vylepšená separace

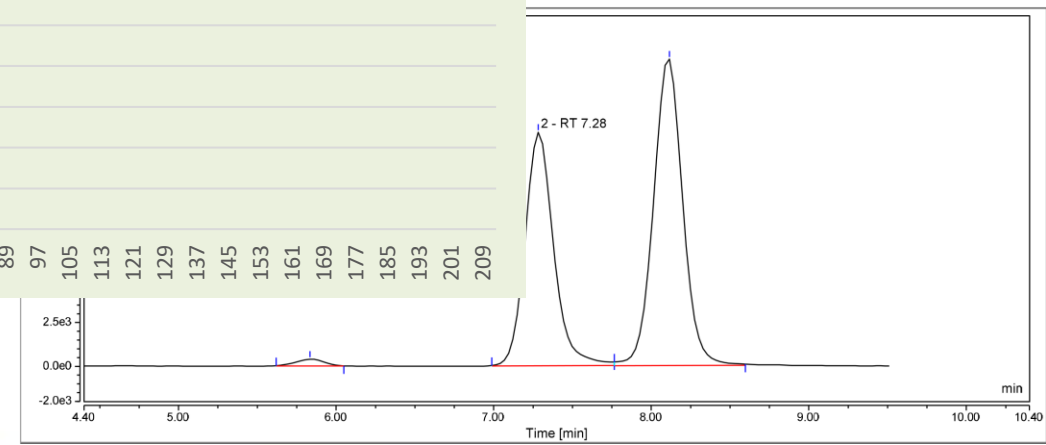
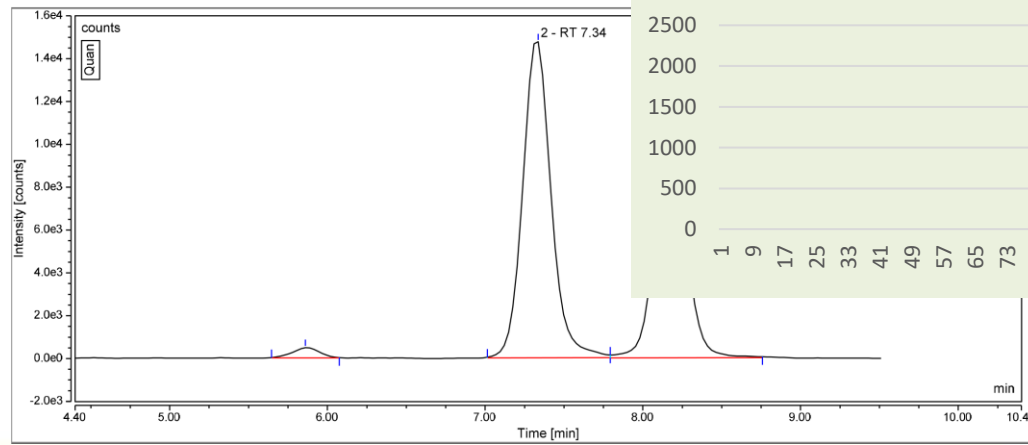
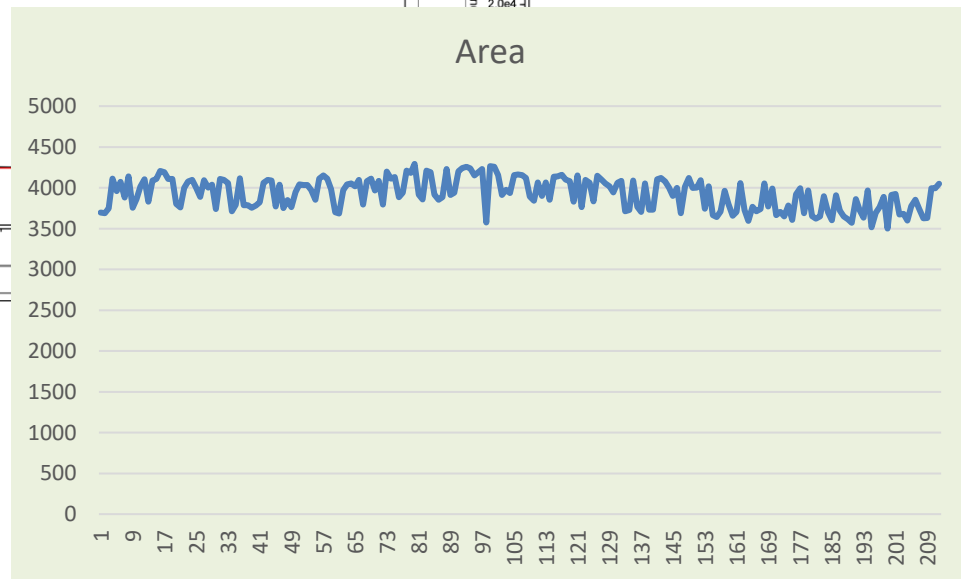
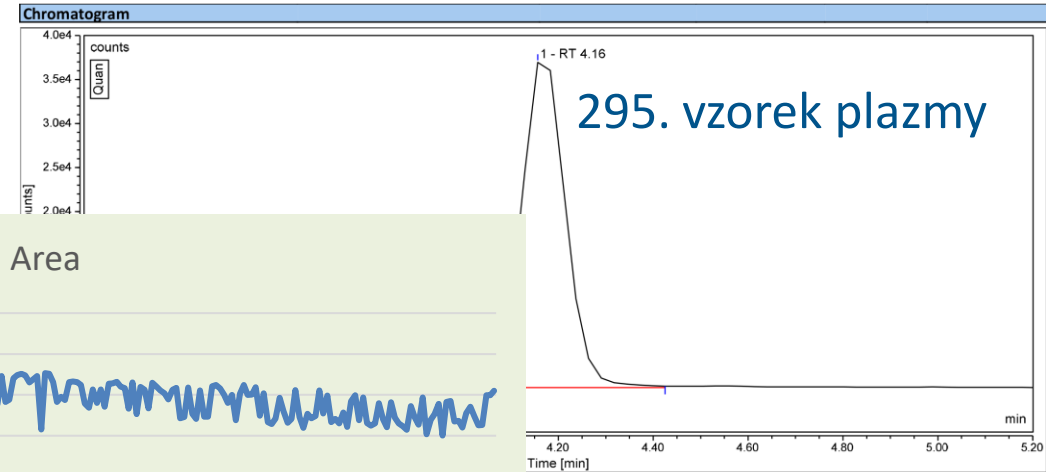
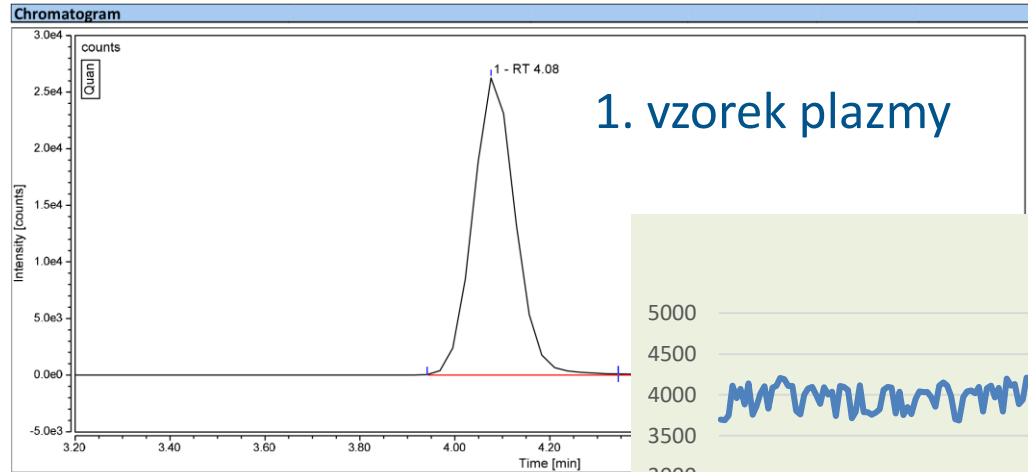
# Aminy na ASTRA® DM- výsledek



Zde se zkoušely různé podmínky, pH testováno od 2 do 10, různé modifikátory, relativně složitý vývoj metody

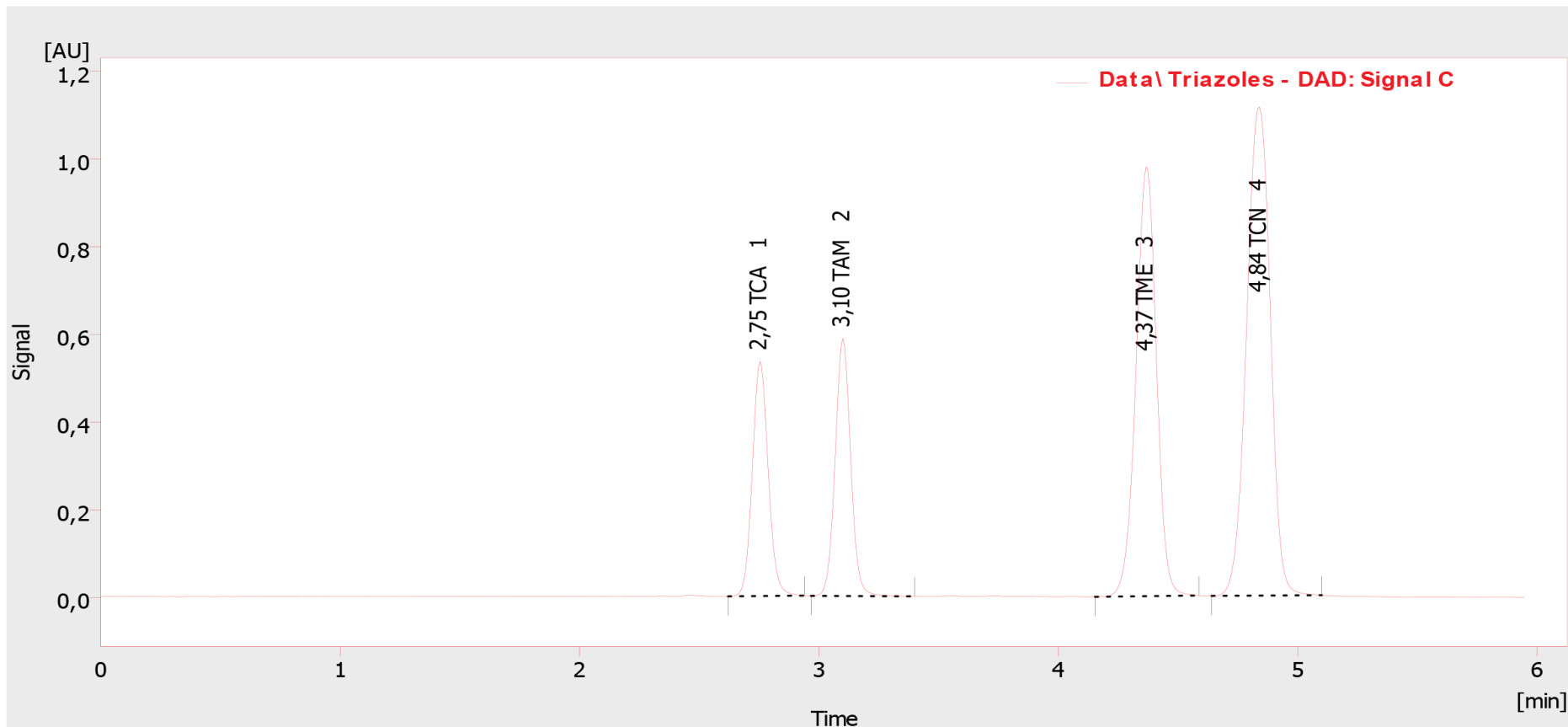


# Reálné vzorky (API-glukuronid –Astra® C18-HE)



Column : PN: AST-5810-IK46; Astra DM 150x4,6mm, 3µm  
 Mobile Phase : 2mM Amonium formate + 0,1% FA, pH 2,83 : MeOH (90:10)  
 Flow Rate : 1,0 ml/min  
 Note : Injection volume: 1 µl  
 Storage solution: MeOH  
 SN: B00044

Detection : 210 nm  
 Temperature : 25°C  
 Pressure : 170 bar



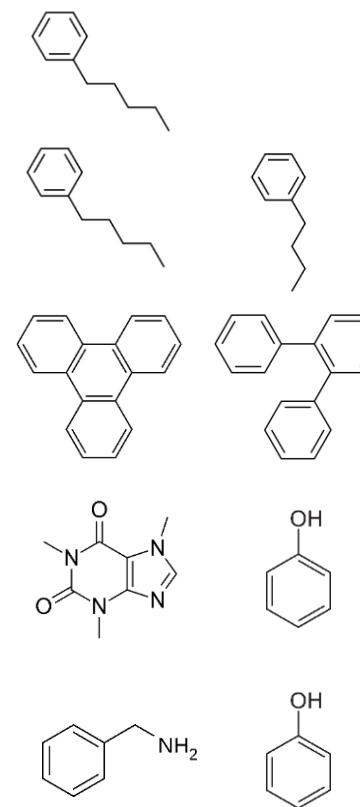
Column Performance Table (From 50% - Data\Triazoles - DAD: Signal C)

	Reten. Time [min]	Capacity [-]	Symmetry/Tailing [-]	Efficiency [th.pl]	Eff/l [t.p./m]	Compound Name
1	2,753	0,00	1,093	6562	43748	TCA
2	3,100	0,13	1,040	8319	55458	TAM
3	4,367	0,59	0,987	12127	80843	TME
4	4,840	0,76	0,947	10104	67359	TCN

# ARION/ASTRA - Pavučinový Graf

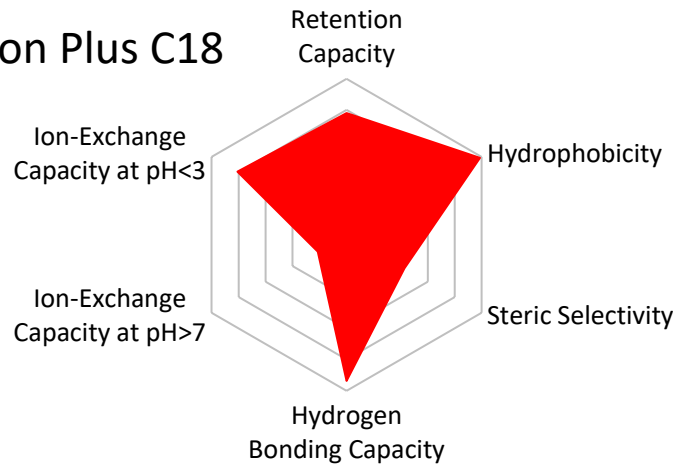
## Tanaka Plot

Test	Stationary phase property	Stationary phase characteristics	Mobile phase	Measured parameter
A	Retention capacity (hydrophobicity)	Surface area and coverage	80 % methanol + 20 % water (v/v)	k' (pentyl benzene)
B	Hydrophobicity (methylene selectivity)	Surface coverage	80 % methanol + 20 % water (v/v)	$\alpha$ (pentyl benzene, butyl benzene)
C	Steric selectivity	Surface coverage – chain length, bond density and types	80 % methanol + 20 % water (v/v)	$\alpha$ (triphenylene, o-terphenyl)
D	Hydrogen bonding (silanol) capacity	Silanol group amount, end-capping, surface coverage	30 % methanol + 70 % water (v/v)	$\alpha$ (caffeine, phenol)
E	Ion-exchange capacity at pH>7	Silanol group amount, number of ion-exchange sites	30 % methanol + 70 % phosphate buffer 0,02M, pH 7,6	$\alpha$ (benzyl amine, phenol)
F	Ion Exchange capacity at pH<3	Number of ion-exchange sites at pH<3, pre-treatment of SiO <sub>2</sub>	30 % methanol + 70 % phosphate buffer 0,02M, pH 2,7	$\alpha$ (benzyl amine, phenol)

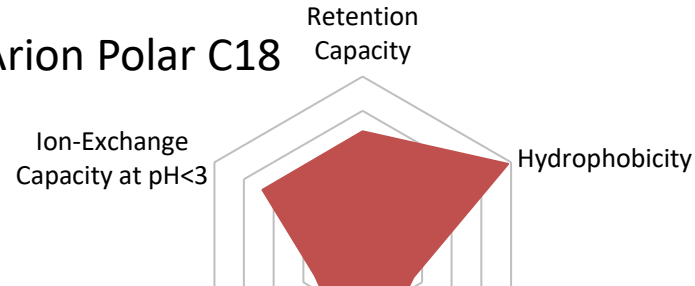


# ARION/ASTRA - Pavučinový Graf

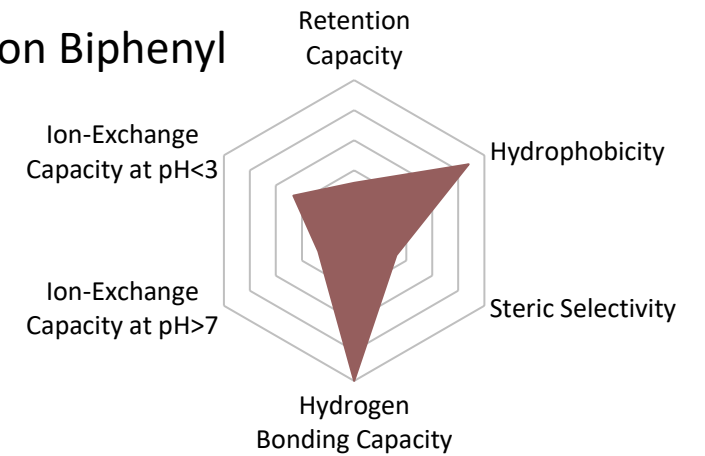
**Arion Plus C18**



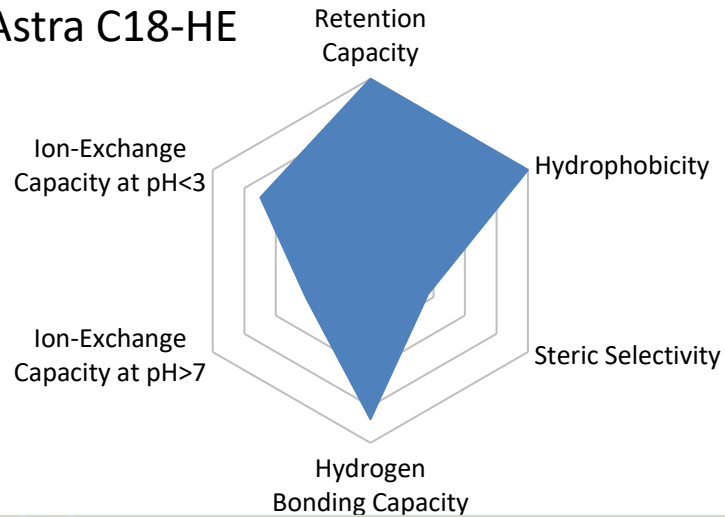
**Arion Polar C18**



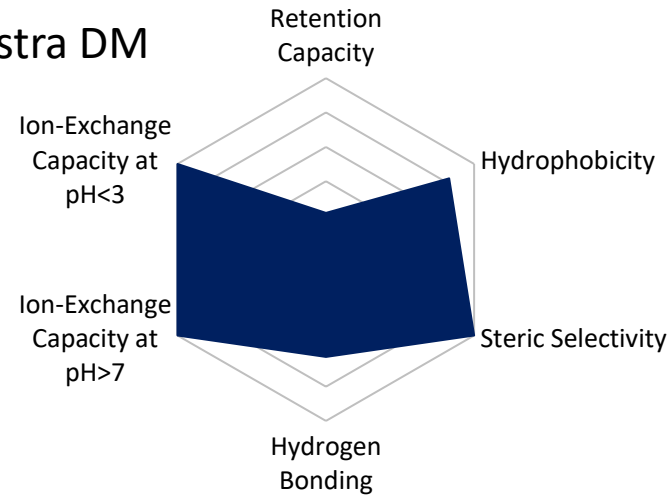
**Arion Biphenyl**



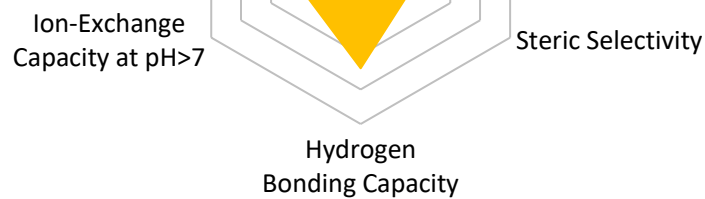
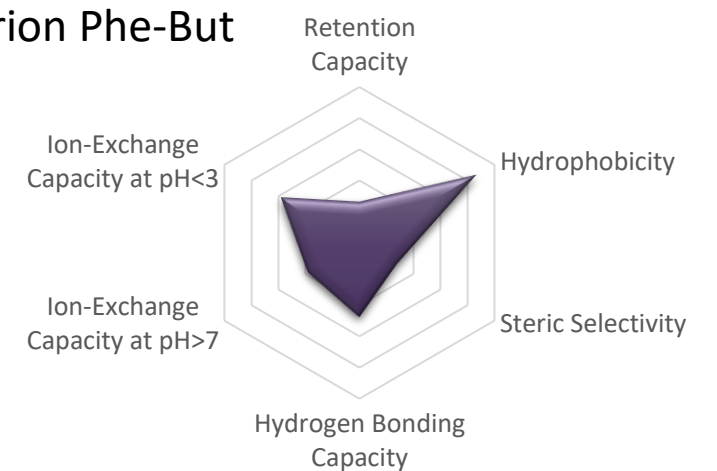
**Astra C18-HE**



**Astra DM**



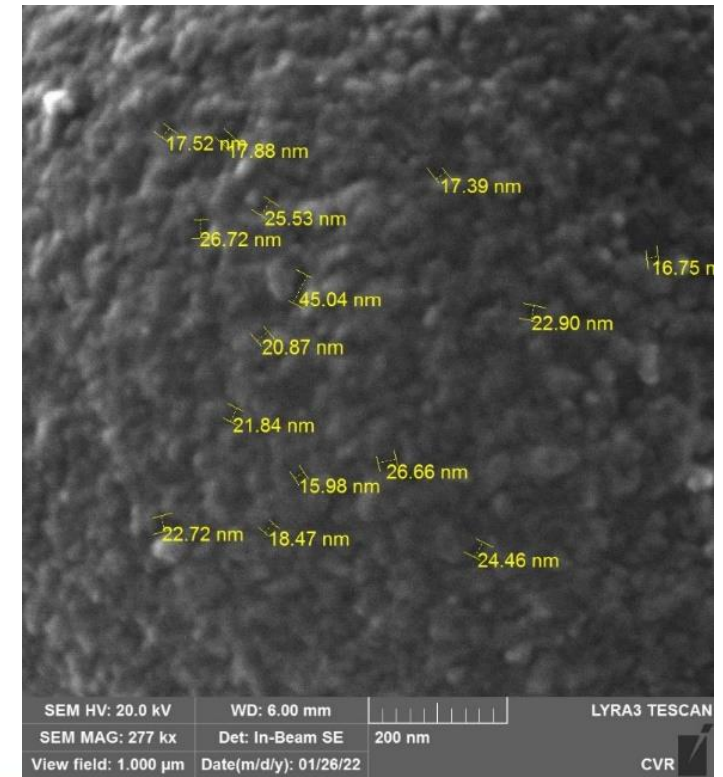
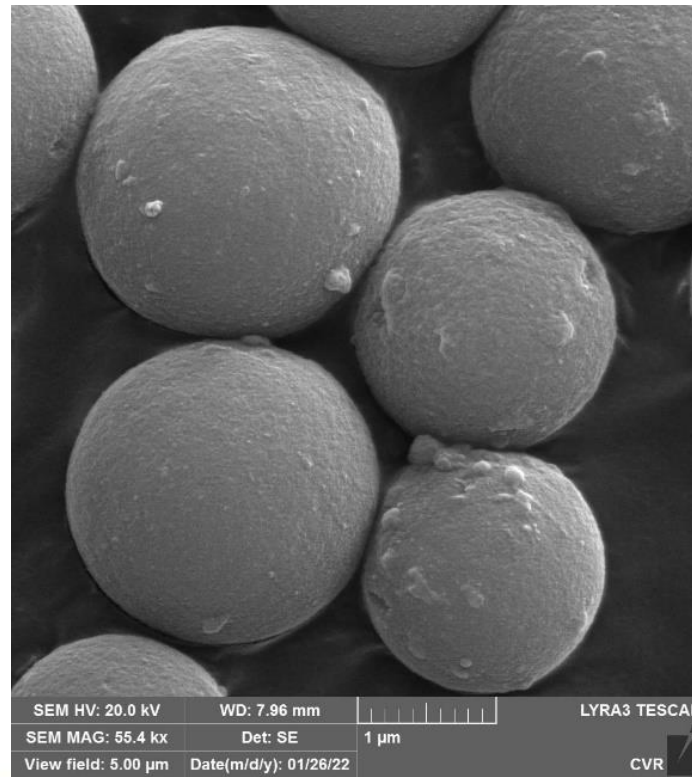
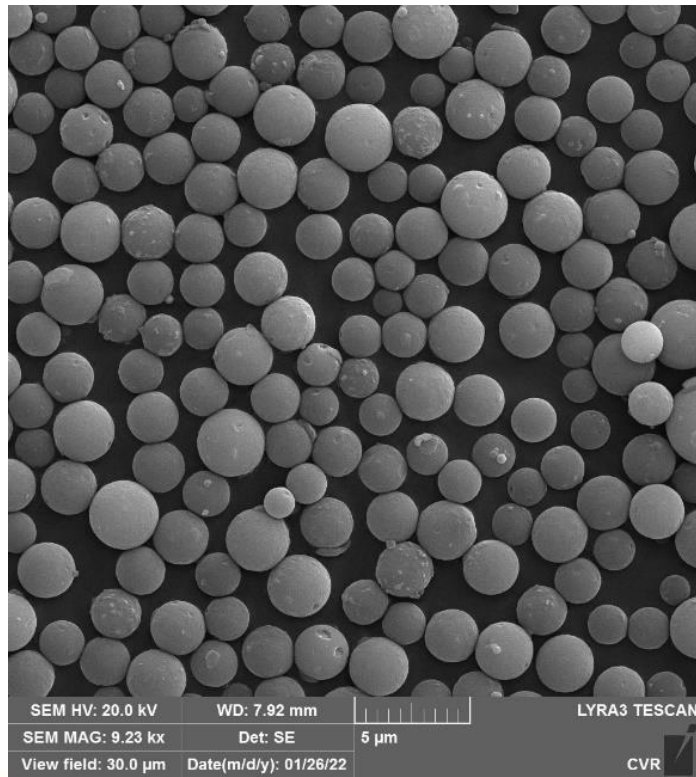
**Arion Phe-But**





# ASTRA<sup>®</sup> C18-HE, 2 μm UHPLC

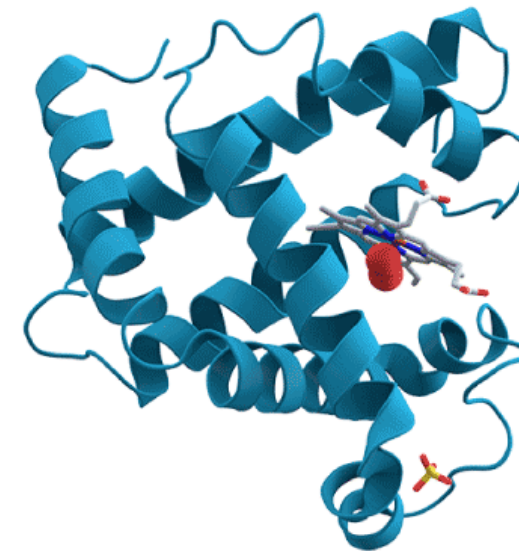
- Detailní SEM analýzy včetně statistického zpracování
  - Distribuce částic, kruhovitost, charakteristika pórů



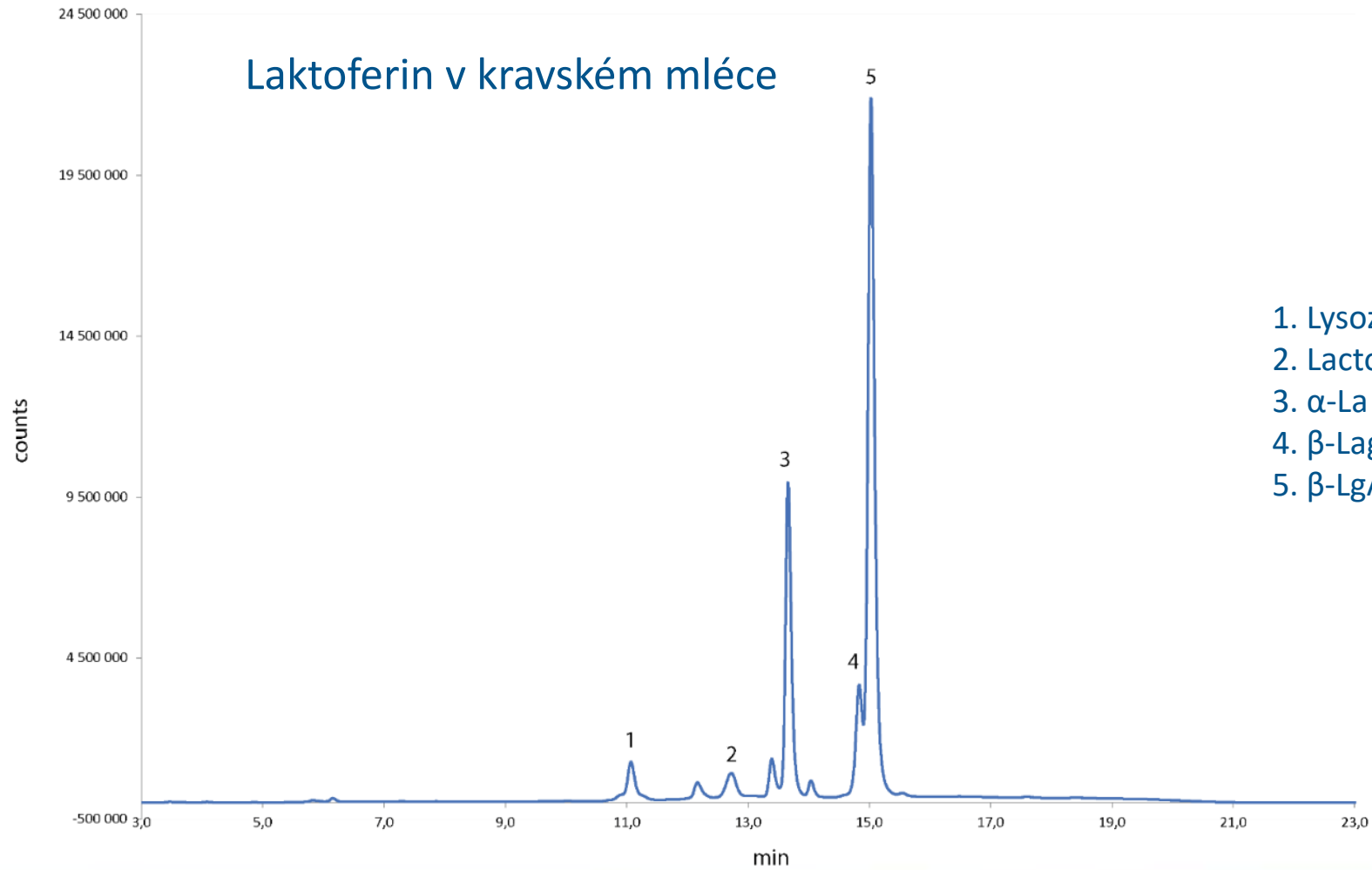
# Nové Arion® BIO kolony

	Pore size	Surface area	Carbon load	pH stability	Endcapping	Max. Temperature	Max. pressure
ARION C18-BIO	300 Å	110 m <sup>2</sup> /g	11 %	1.5 to 7.5	Proprietary	100°C	400 bar
ARION C4-BIO	300 Å	110 m <sup>2</sup> /g	4.5 %	1.5 to 7.5	Proprietary	100°C	400 bar

	Molecule size	Recommended for	
ARION C18-BIO	<50 kDa	Oligopeptides & Peptides	
ARION C4-BIO	50 to 150 kDa	Proteins & Polypeptides	



# Aplikace Arion® BIO



1. Lysozyme
2. Lactorferrin
3.  $\alpha$ -La ( $\alpha$ -Lactalbumin)
4.  $\beta$ -LagB ( $\beta$ -Lactoglobulin, BLG)
5.  $\beta$ -LgA ( $\beta$ -Lactalbumin)

## ChromShell – nabídka fází





## Spolupráce s českými vědci / výzkumníky

- Univerzita Karlova
- VŠCHT Praha
- ČVUT Praha
- Centrum výzkumu Řež
- FaF UK v Hradci Králové
- UPCE
- UJEP v Ústí n/L
- TAČR



UNIVERZITA KARLOVA  
Farmaceutická fakulta  
v Hradci Králové



**VŠCHT PRAHA**

**Děkuji za pozornost,  
přeji hezký den**