

1. Introduction

Recently, ultra-fast LC has been widely applied to analysis of various fields such as pharmaceuticals, foods, and environmental. Although commercial columns packed with sub-2 μm or 2 μm particles give improved efficiency and reduced analysis time, acceptable retention or separation has not been often achieved in many hydrophilic compounds such as metabolites or natural compounds.

To solve these problems, we have lined up a new category of products, YMC-UltraHT Hydrosphere C18, into our 2 μm columns for ultra-fast LC. The balanced hydrophilic/hydrophobic nature of this packing material provides strong retention and superior selectivity of highly polar compounds. Also this new column maintains all the advantages of 2 μm YMC-UltraHT Pro C18 column. Our 2 μm columns show almost same efficiency of sub-2 μm columns with about 40 % lower back-pressure and they can be used with ordinary LC systems.

In this poster, we will show some example cases of fast and efficient separation of pharmaceuticals and metabolites containing polar compounds. We will also compare the retention and elution achieved with Hydrosphere C18 and those achieved with other C18 columns for ultra-fast LC.

2. Features of YMC-UltraHT columns

High column efficiency with minimum column pressure

- Functionalized ultra-pure 2.0 μm silica gel with 120 Å pore size.
- Designed for lower pressure but better performance than sub-2 μm particles.
- Instruments are not only specific ultra-fast LC but ordinary LC available.

Easy scalability of separation

- Identical selectivity as 3 μm or 5 μm conventional Pro series columns within same bonded phase.
- Applicable for various compounds such as pharmaceuticals, foods and natural products.
- Simple method transfer applicable without changing eluent conditions.

3. New UltraHT column for polar compounds

YMC-UltraHT Hydrosphere C18

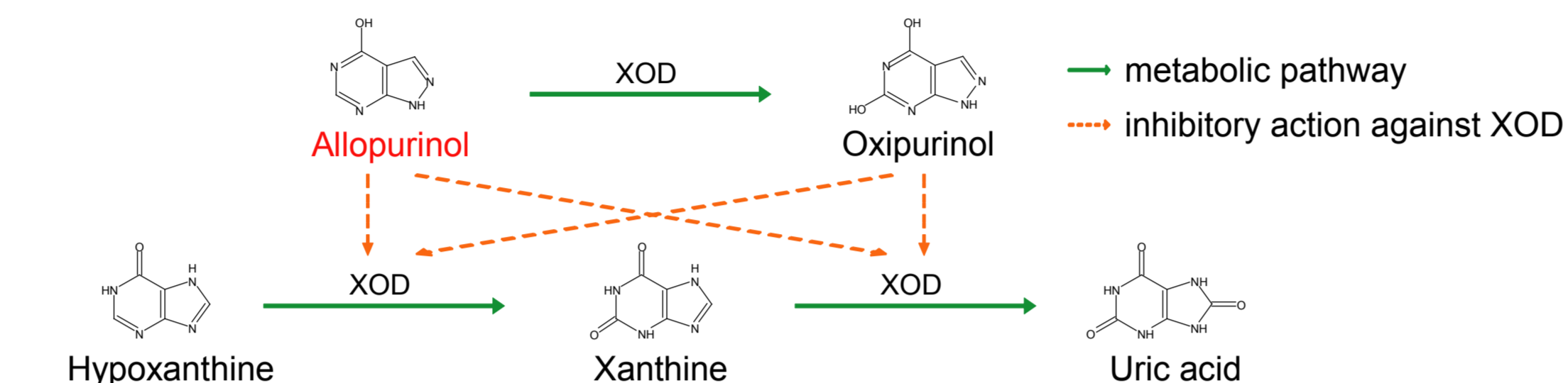
- Designed for strong retention and superior resolution selectivity of polar compounds.
- Excellent reproducibility of retention time under 100 % aqueous condition.
- Unique selectivity that differs from standard ODS, Pro C18.

	Hydrosphere C18	Pro C18
feature	for polar compounds	standard type ODS
particle size (μm)	2, 3, 5	2, 3, 5, 10
carbon contents (%)	12 %	16 %
bonded phase	monomeric	monomeric
end-capping	completely end-capped	completely end-capped

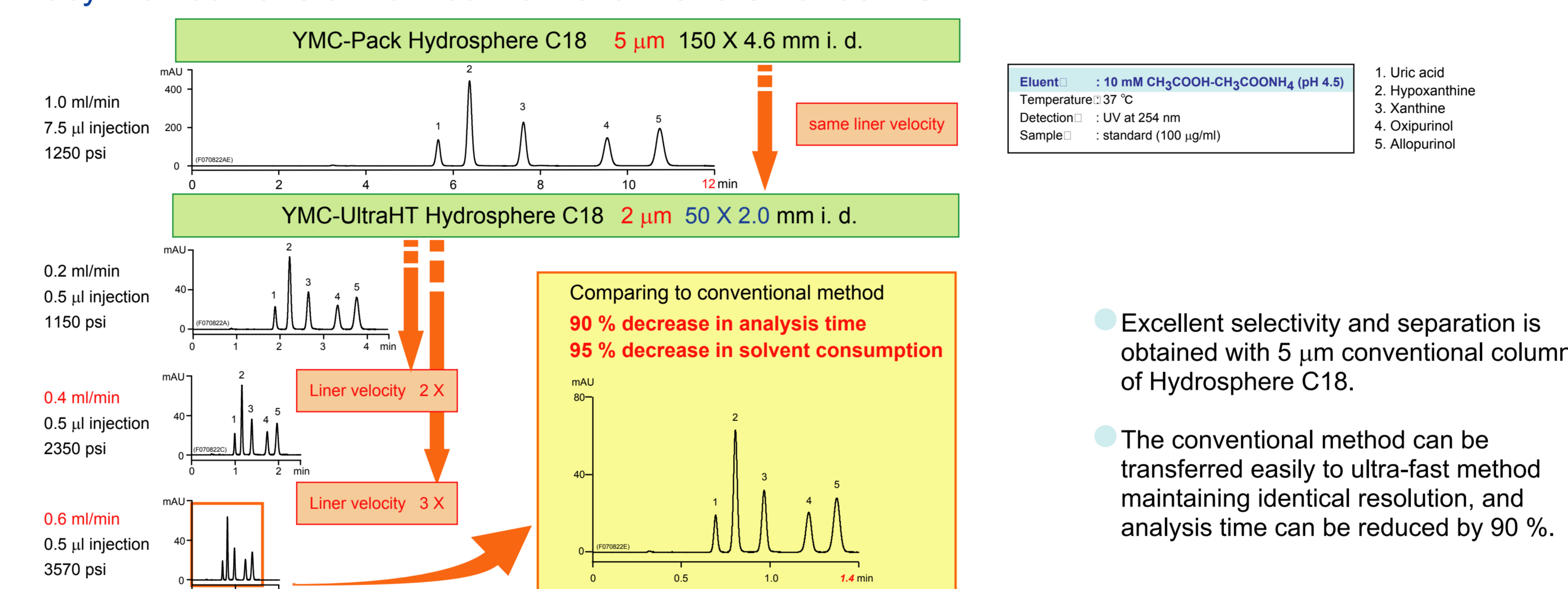
4. Fast and efficient separation of polar compounds on YMC-UltraHT Hydrosphere C18

Ultra-fast analysis under 100 % aqueous condition

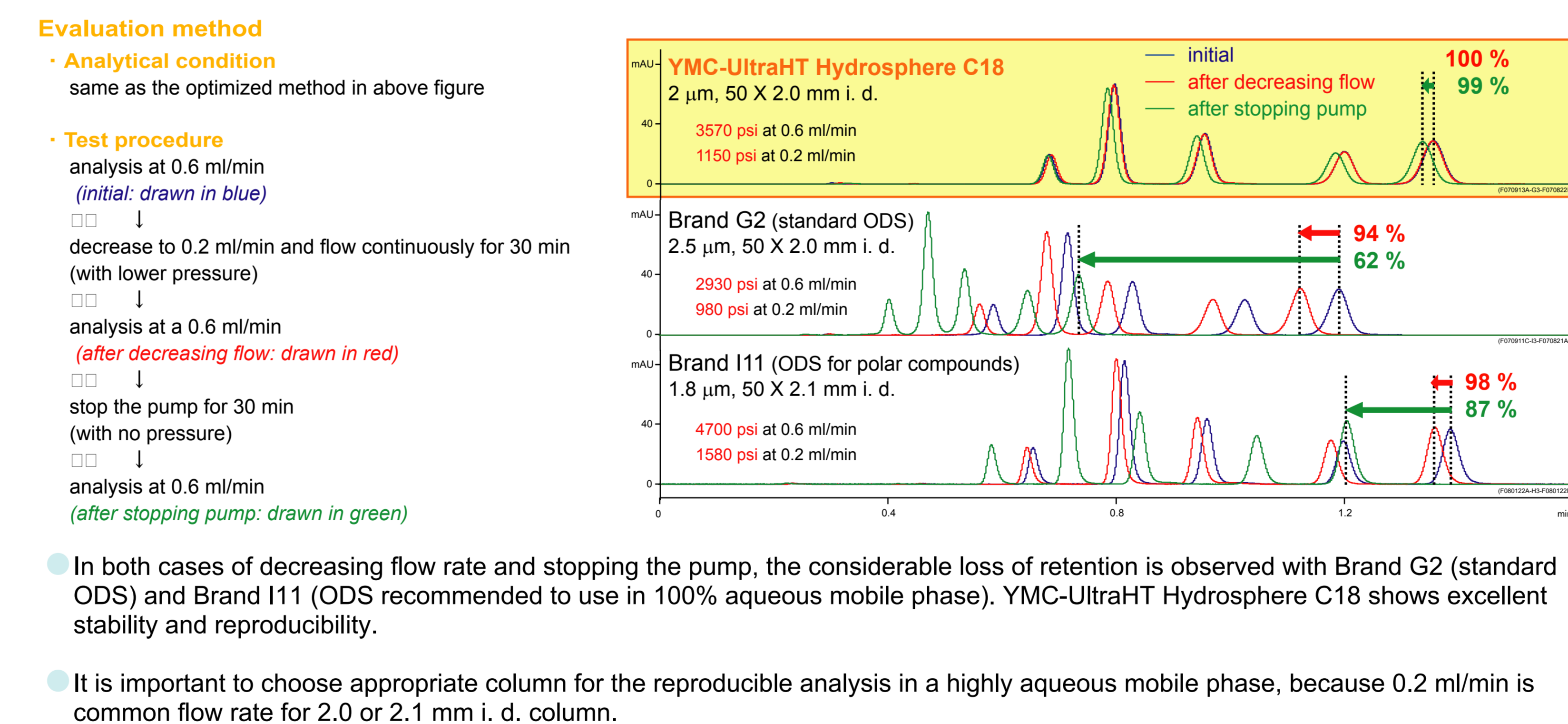
Xanthine oxidase (XOD) inhibitor and related metabolites



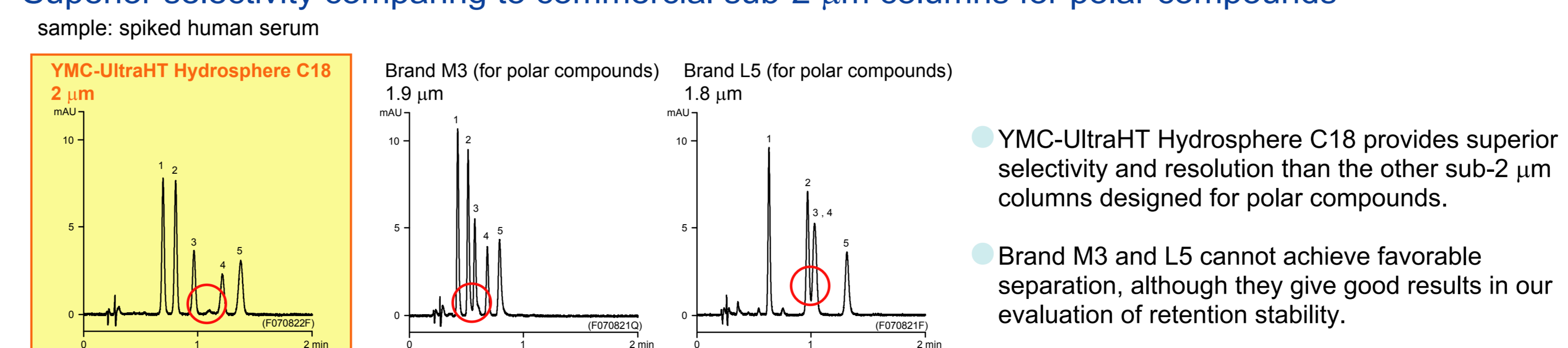
Easy method transfer from conventional LC to Ultra-fast LC



Comparison of retention stability in 100% aqueous mobile phase

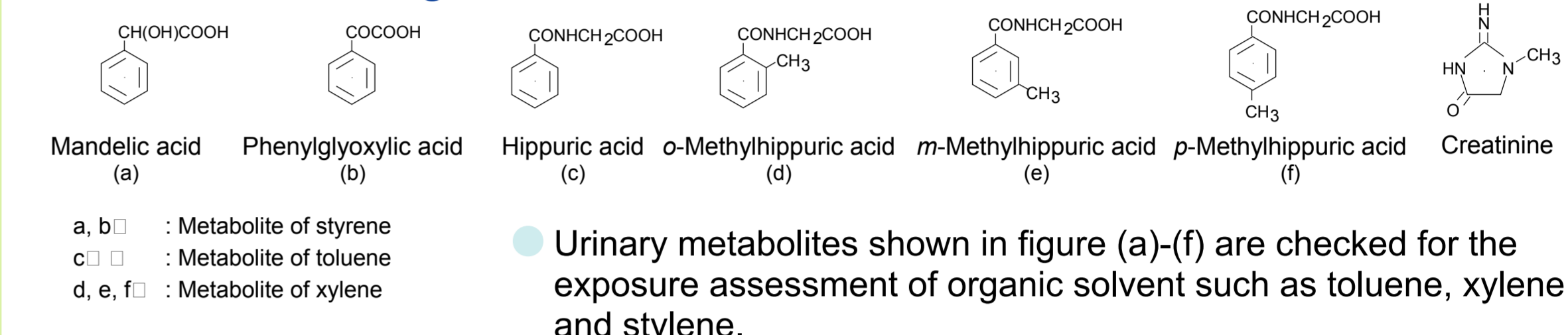


Superior selectivity comparing to commercial sub-2 μm columns for polar compounds

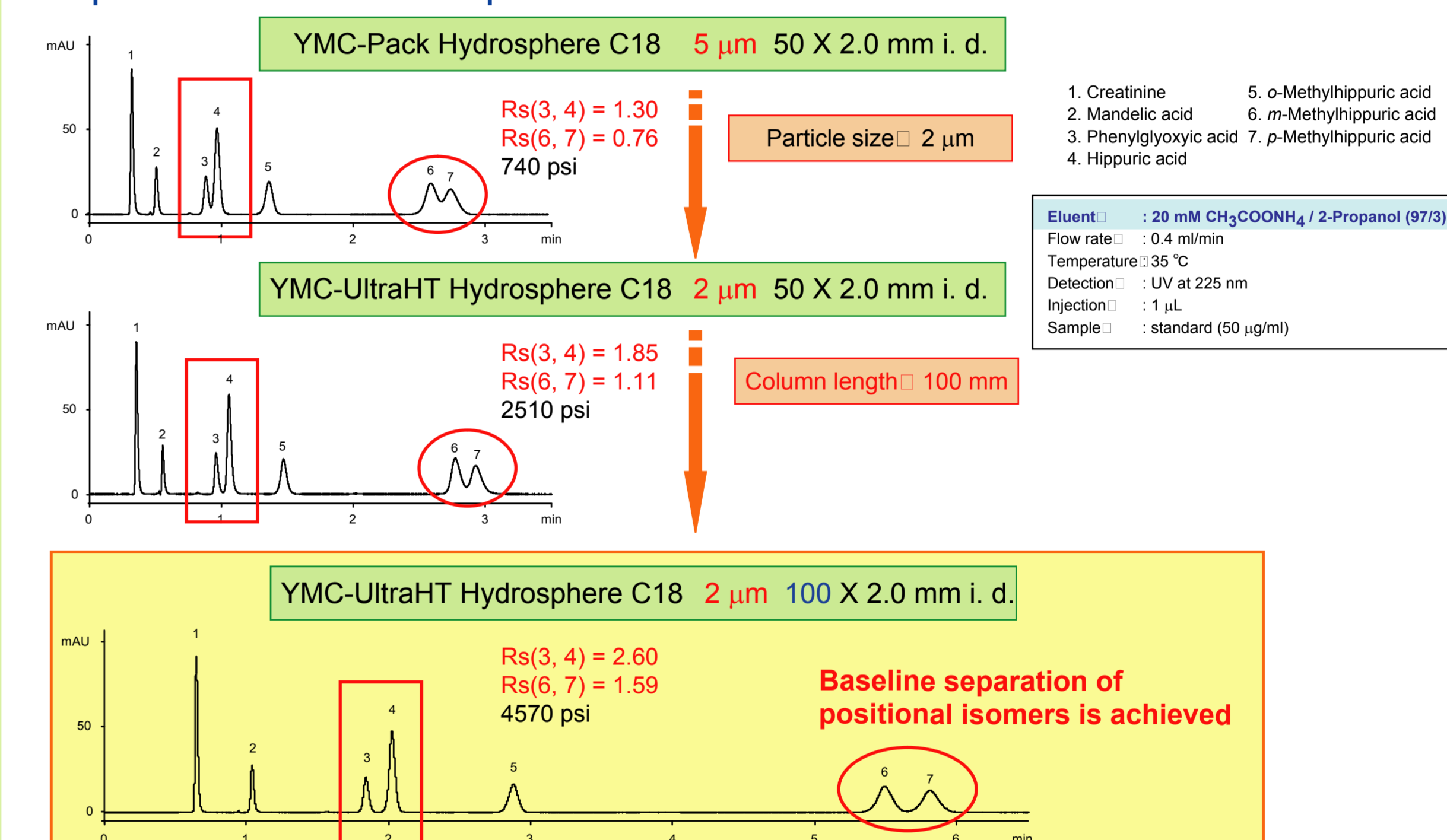


Ultra-high resolution of polar metabolites

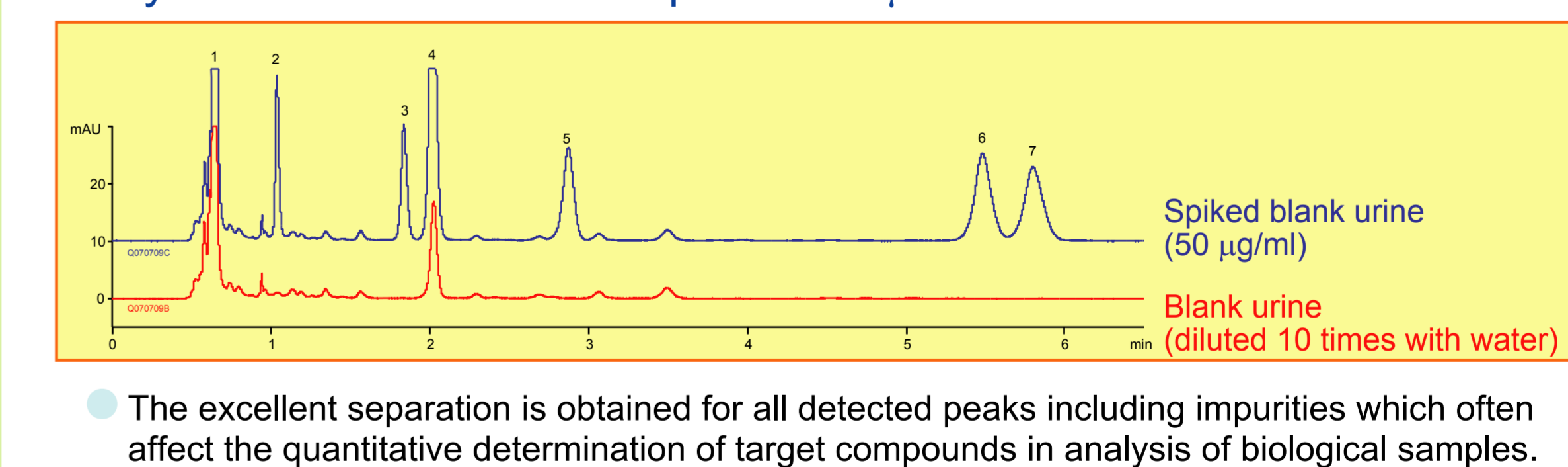
Metabolites of organic solvents in urine



Improved resolution of positional isomers



Analysis of human urine sample with 2 μm 100 X 2.0 mm i. d. column



5. Conclusions

- YMC-UltraHT Hydrosphere C18 shows same selectivity as existing 3 μm and 5 μm Hydrosphere C18, so easy method transfer can be achieved between conventional LC and Ultra-fast LC without changing eluent condition.
- YMC-UltraHT Hydrosphere C18 provides superior resolution and excellent retention reproducibility of highly polar compounds even in 100 % aqueous mobile phase.
- The combination of high efficiency and unique selectivity of YMC-UltraHT Hydrosphere C18 enables the high-throughput analyses of various pharmaceuticals, foods and natural products containing polar compounds.