

Novel 8- μ l Blood Micro Sampling Followed by LC-MS and GC-MS Analysis Shows Low Levels of Pesticides in Farmland Birds from Sweden



MICRO SAMPLING IS KEY

- Blood volume restricted in small wild species and laboratory animals
- Juveniles extra sensitive both regarding volume and handling
- Enables reduction and refinement in animal research (3Rs)



FIELD STUDY IN BIRDS

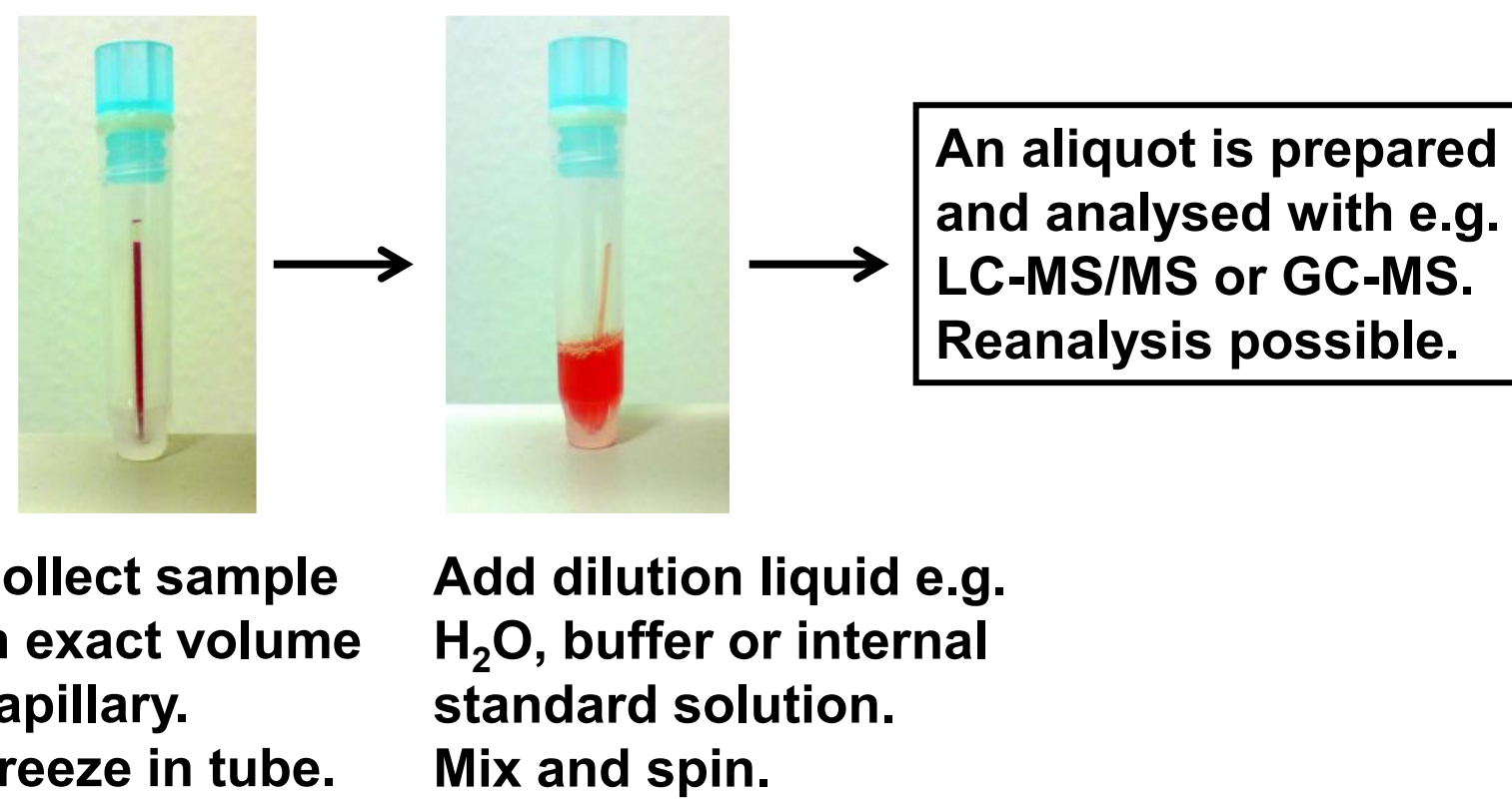
- Skylarks, and yellowhammers sampled in Swedish agricultural areas, ortolan buntings in clear-cuts
- Pesticides detected in 50% of the blood samples, concentrations 0.02–50 ng/ml (average 3.4 ng/ml)
- Fungicides pyraclostrobin and fenpropimorph and herbicide tribenuronmethyl most common
- EU-banned insecticide chlorpyrifos in blood from adult ortolan buntings indicates exposure outside of Sweden during migration or winter stay



CAPILLARY MICROSAMPLING (CMS) RATIONAL SAMPLE HANDLING

- CMS offers accurate handling of liquid micro samples
- Liquid blood \rightarrow no haematocrit issues
- Handle blood, plasma or other biofluids
- For unstable compounds: Mix with stabilizing solution and place on dry ice within 10 seconds
- Low price, no expensive extra equipment or consumables needed
- CMS samples in 96-format tubes enables automation using standard liquid handling robots, decappers and barcode scanners, and small footprint storage

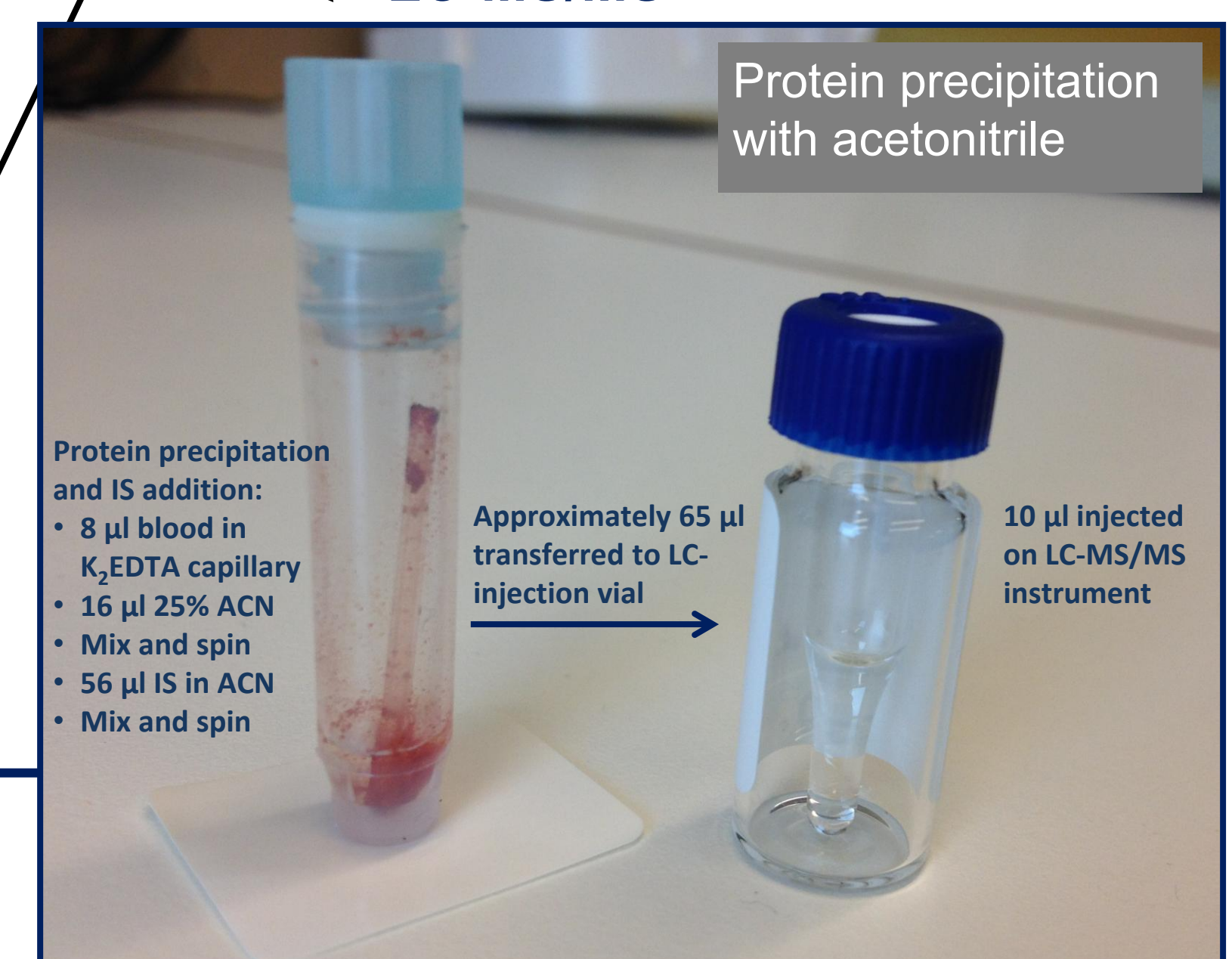
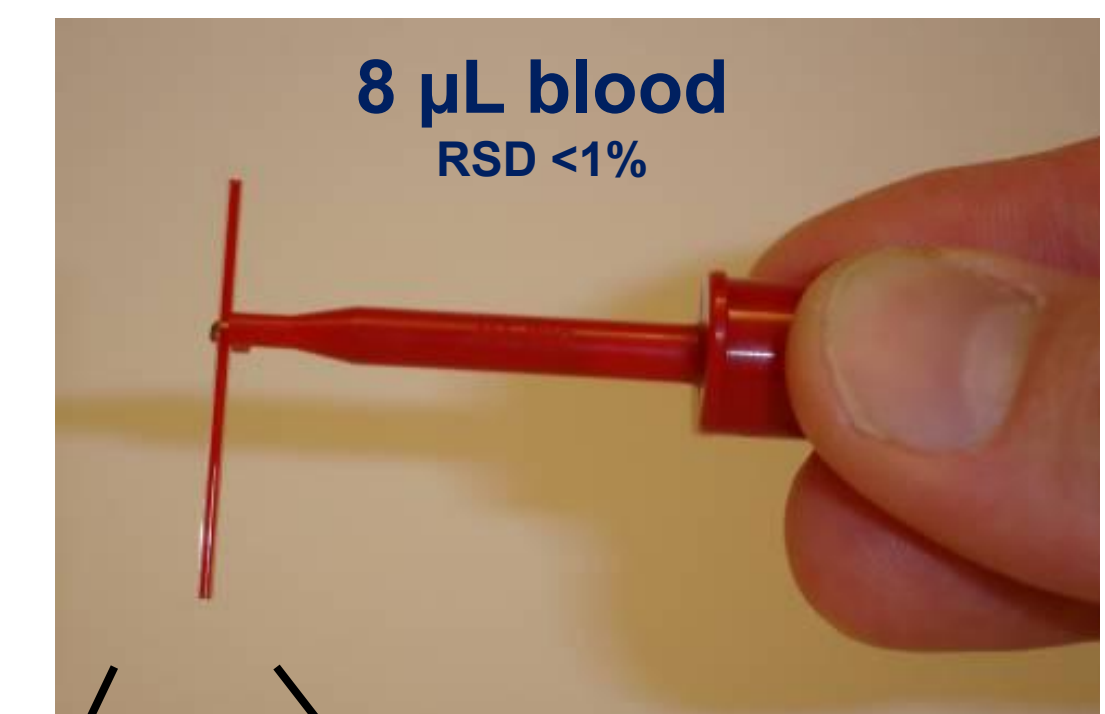
CMS BASIC PRINCIPLE



Skylark juveniles in nest

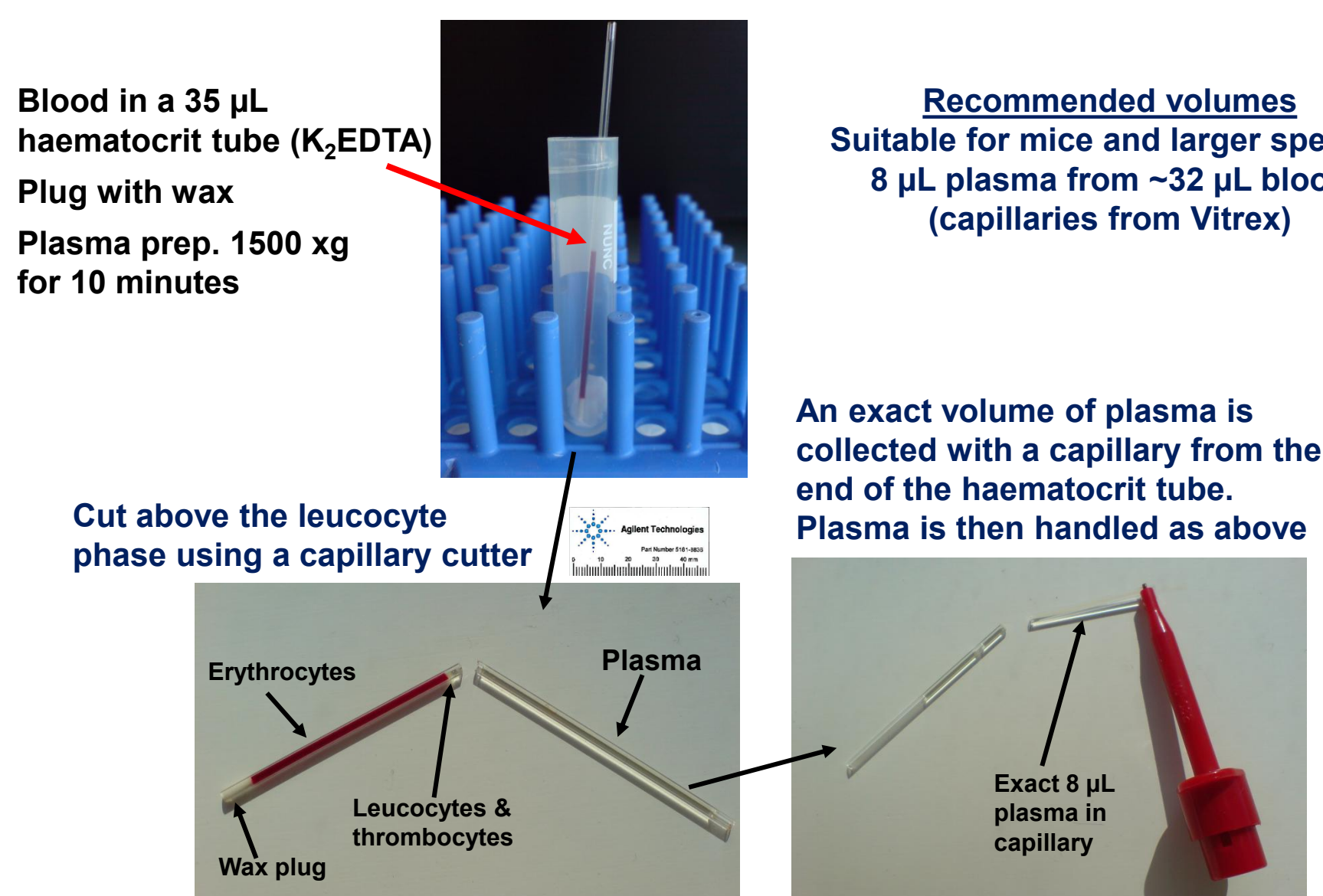


EXACT VOLUME WITH END-TO-END CAPILLARY LIQUID SAMPLE \rightarrow LIQUID HANDLING

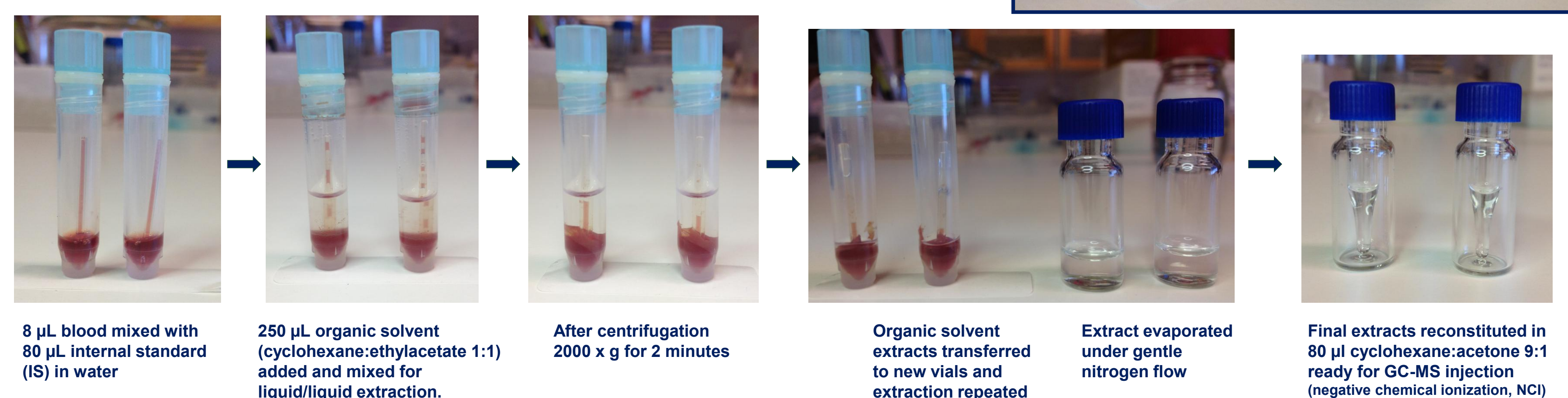


PLASMA INSTEAD OF BLOOD?

PLASMA IS ROUTINELY USED IN THE PHARMACEUTICAL INDUSTRY. ENABLES BLOOD/PLASMA DISTRIBUTION DETERMINATION EX VIVO FROM PARALLEL SAMPLING



Liquid-liquid extraction in micro scale combined with CMS for the first time



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CENTRE FOR PESTICIDES IN THE ENVIRONMENT