How to scale up a method from low throughput to high throughput for the quantification of 16 nucleosides? Lesson from experience.

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Context: Agriculture, pesticides and cancer

Link between occupational exposures and cancers demonstrated in farmers

Pesticides exposure effects? Other determinants?

- Molecular epidemiology approach
- ☐ Investigation on biobanks samples
- ☐ Important statistical power needed

Agricultural cohort with exposure description and tasks listing

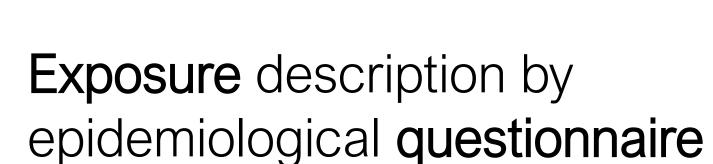
EPIBIO97 Biobank

Biobank made with

- ❖ 795 individuals at initial sample time in Calvados department area with blood and urine samples
- **300 follow up** after 10 years

Working in

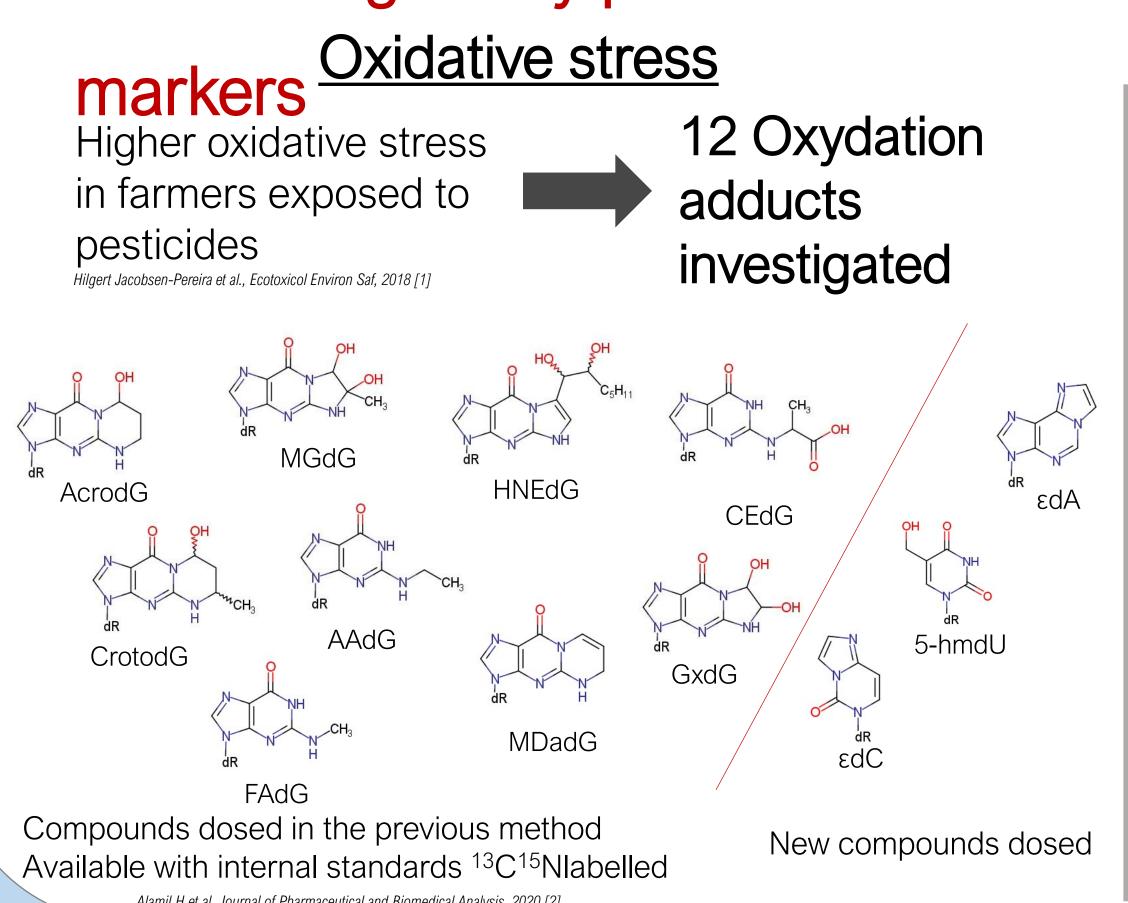
- Field Crop
- Bovine breeding

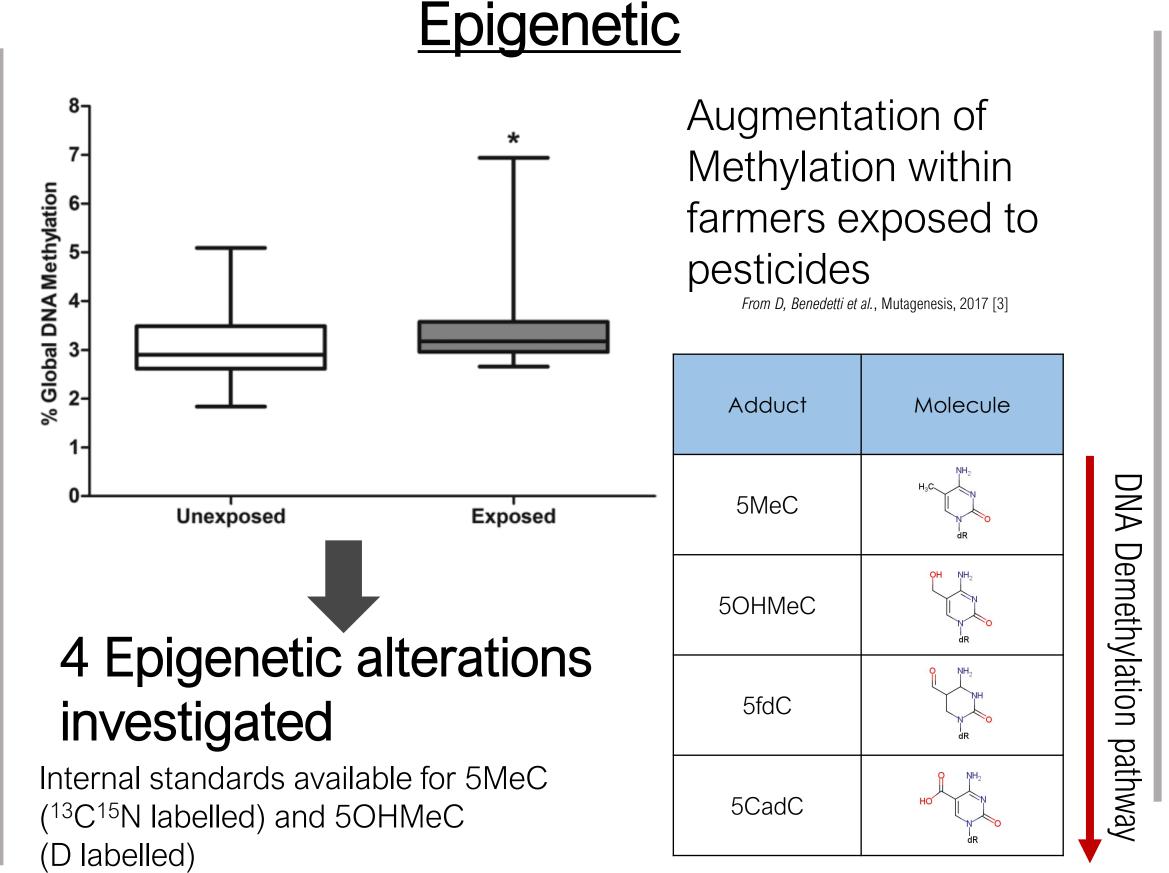




Plausible mechanism of cancerogenicity

2 cancerogenicity possible mechanisms studied through analysis of epigenetic and genotoxic alteration





Development of a HPLC-HRMS/MS method for the simultaneous analysis of 16 nucleosides in human blood



Numerous sample preparation steps

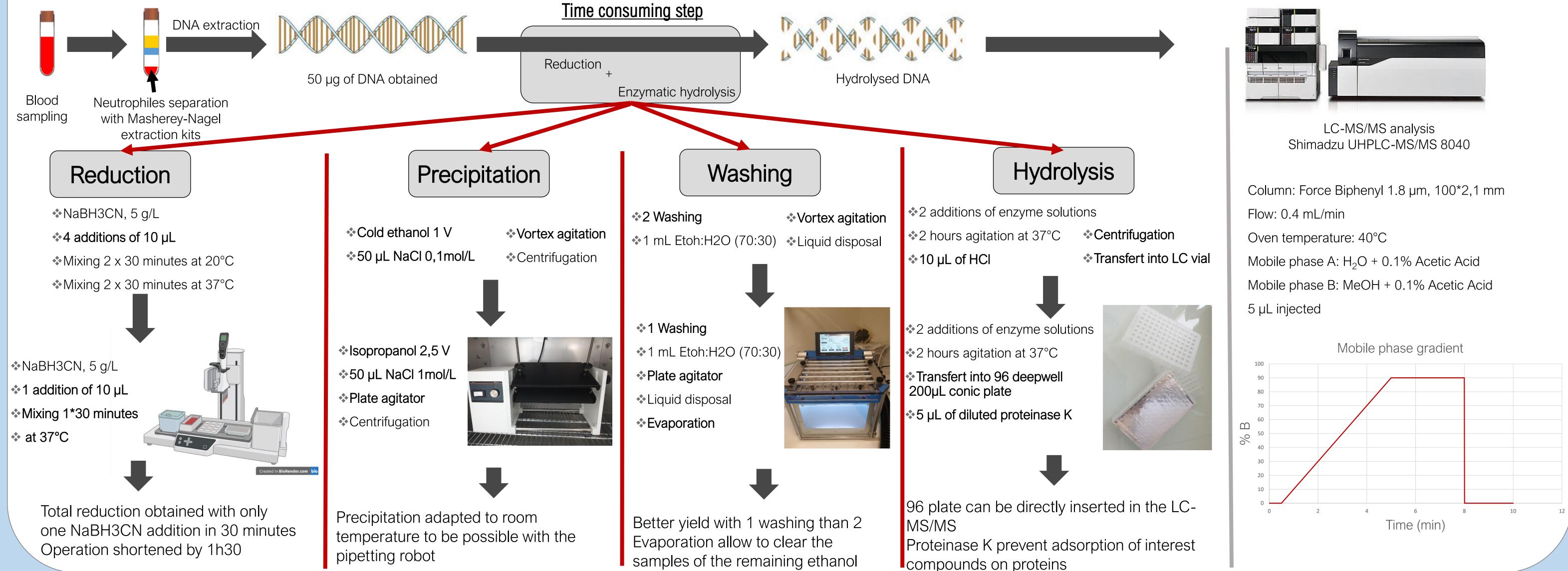


High throughput for the preparation of a high number of samples

Analytical method

All solution additions are made with an Integra Assist+ pipetting robot

For each 96 well plate, 8 calibration points, 2 blanks, and 10 quality check are prepared, according to ICH M10 recommendation Sample preparation Analytical parameters



Conclusion and current progression

- Optimisation for the preparation of 380 samples / week
- Analysis of the **795 agricultural workers** from the biobank
- Association of **DNA adduct profiles** with **occupational exposure** to pesticides
- Already more than 600 samples extracted
- First analysis currently ongoing











soybean farmers exposed to complex mixture of pesticides. Mutagenesis. 2018 Feb 24;33(1):87–95.

oxidative stress in farmers exposed to pesticides. Ecotoxicology and Environmental Safety. 2018 Feb;148:177–83.

exocyclic DNA adducts induced by 8 aldehydes. Journal of Pharmaceutical and Biomedical Analysis. 2020 Feb;179:113007



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