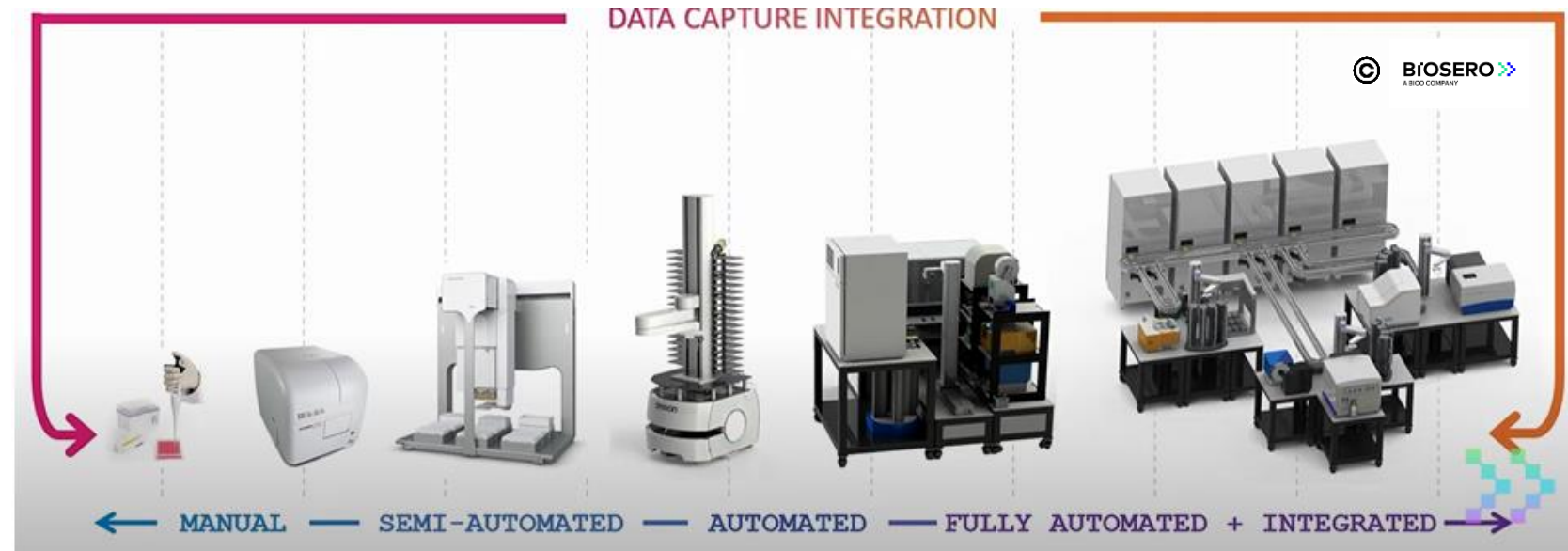


Automation – robots, logiciels, cellules?

Un survol

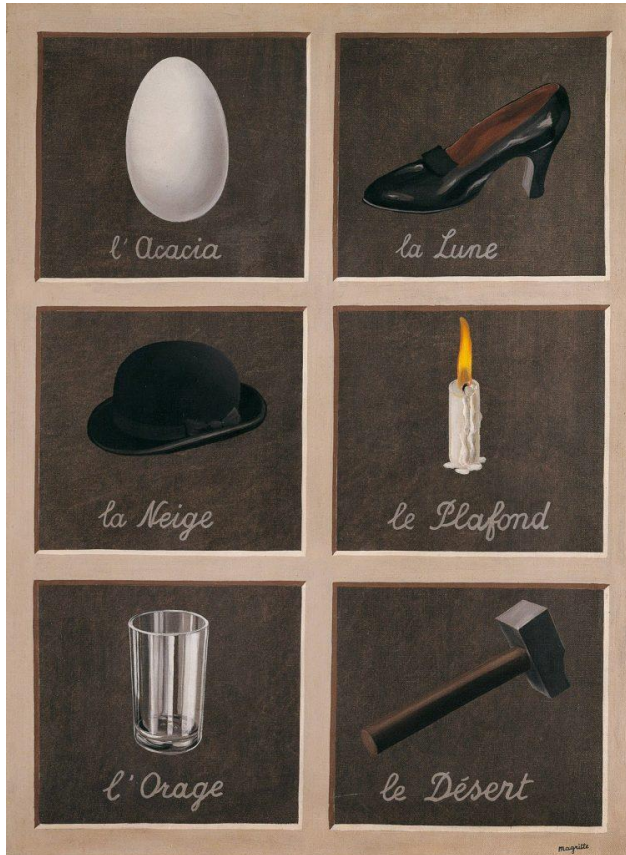
Moritz Wagner

L'évolution de l'Automatisation dans les laboratoires



Du rêve à la réalité

La clef des songes -
René Magritte, 1930



Les clés de la réussite -
Collaborations Automation 2026 (incomplet)



1. Geosmin & 2-MIB Solution In Drinking Water by SPME Arrow (Based on GB 5750-2023)
2. 53 Off-flavor Compounds Solution by SPME Arrow
3. Automated LLE solution for 34 Organochlorine Pesticides & Chlorobenzenes (Based on HJ 699-2014)
4. Automated SVOC Screening by LLE & SPME Arrow on GCMS & GCMSMS
5. Automated Phenols Derivatization Solution in Water (Based on HJ744 -2015)
6. EPA 8270E Solution (150+ SVOC compounds validated)



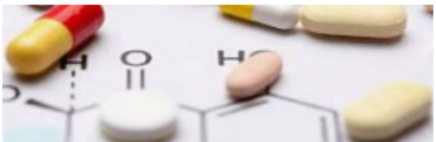
1. uSPE-QuEChERS Solution for GCMSMS (GB23200.113.2018) & LCMSMS (GB23200.121-2021)
2. PFAS In Seafood Analysis on LCMSMS*
3. Volatile PFAS In Disposable Utensils Analysis on GCMSMS (In Progress)*
4. Vet Drugs Solution uSPE-Cleanup on LCMSMS
5. FAMES Solution on GC-FID System
6. Food Flavor Solutions on GCMS/GCMSMS/GC-QTOF



1. Automated Extraction & Cleanup of Polymer Materials for GCMS (for BASF Shanghai)
2. Automated Serial Dilution for Analysis of Coal Tar on GCMS (for Shanghai Yankuang)
3. Two-Step Derivatization Solution for Metabolomic Analysis on GCMSMS/GCQTOF (for Shanghai Tobacco)



1. Blood Alcohol Solution with RTC on GC-FID/GCMS (Validation in Shanghai Academy of Forensic Science)
2. Blood Alcohol Solution with Dual-head PAL **
3. Analysis of PFAS in Human blood on LCMSMS (Budget ready from Shanghai Jiaotong University)



1. Automated Extraction Solution for Pharma Packaging Material for E&L Analysis on LCMS
2. Filtration solution using Agilent syringe filters for LC & LCMS Analysis (In Progress)

****:** Developed by PAL Solutions in collaboration with Agilent US

Rest of the solutions are all developed at Agilent
China Solution Center



Exemple 2: Un cahier des charges/protocol adapté (nitrosamines)

LC-HRMS Method for the Determination of Six Nitrosamine Impurities in Losartan Drug Substance or Drug Product

Purpose

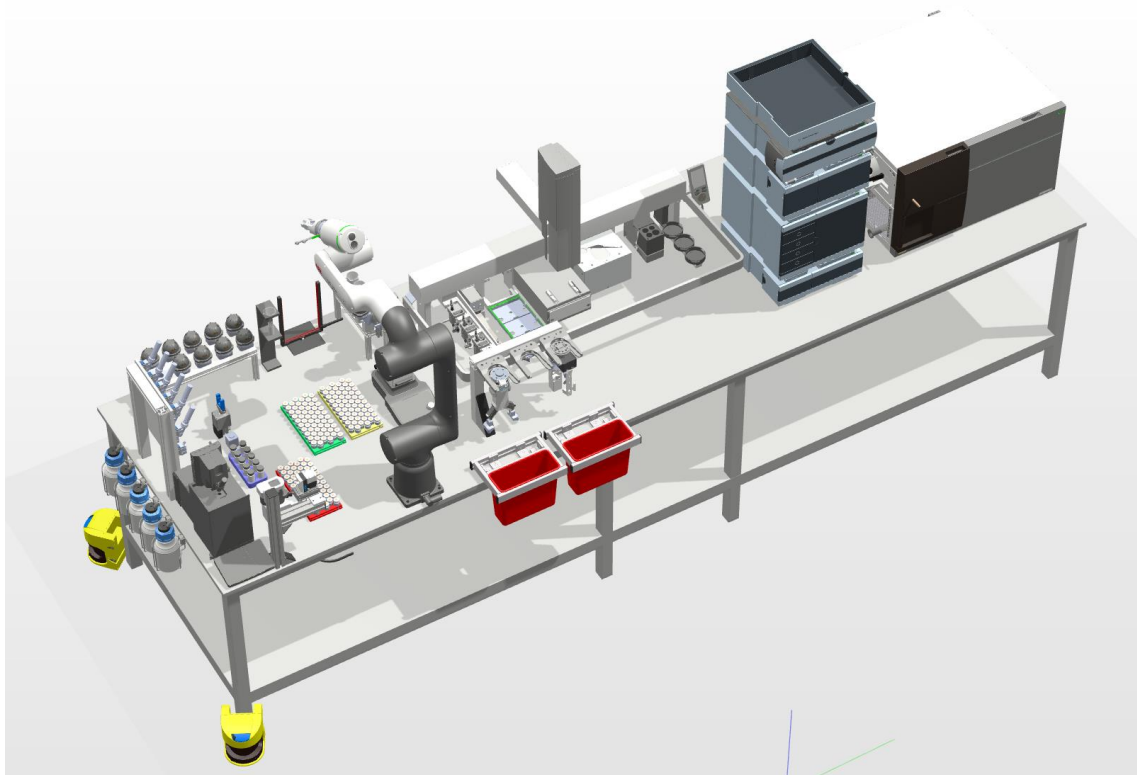
This method is to quantitate the following six nitrosamine impurities in losartan drug substance or drug product: N-nitrosodimethylamine (NDMA), N-nitrosodiethylamine (NDEA), N-nitrosoethylisopropylamine (NEIPA), N-nitrosodiisopropylamine (NDIPA), N-nitrosodibutylamine (NDBA) and N-nitroso-N-methyl-4-aminobutyric acid (NMBA).

Drug product sample preparation

Crush the appropriate number of tablet(s) to obtain a target concentration of 20 mg/mL of API in 5.0 mL of methanol, and transfer into a 15 mL glass centrifuge tube. Add 5.0 mL of methanol and mix for about a minute using a vortex mixer. Shake the sample for 40 minutes using a mechanical wrist action shaker.

After extraction, centrifuge the sample for 15 minutes at 4500 rpm. Filter the supernate using a 0.22 µm PVDF syringe filter, discard the first 1 mL and transfer the filtered sample into an hplc vial for LC/MS analysis.

Exemple 2: le jumeau digital: moulin IKA, balance Mettler-Toledo, bras robotique ABB, préparation CTC et LC/QQQ Agilent



Magnetic stirrer



Vortex



Water bath



Heater



Barcode scanner



Labeler



Centrifuges



Capping / Recapping



Syringe handling



Instrument tending



Shaking beaker / tube



Pouring



Cuvette changer handling



Artificial vision

Exemple 3: le labo complètement automatisé (EPFL Lausanne, des visiteurs sont bienvenues)



ETH zürich

EPFL



AFCAD

Association Francophone de la Chimie
Accélérée et Digitalisée

Toujours à votre disposition



<https://www.promega.de/resources/pubhub/cartoons/cartoon-01/>

We couldn't afford one of those cool PCR robots, so we just got an undergrad and a cardboard box.