

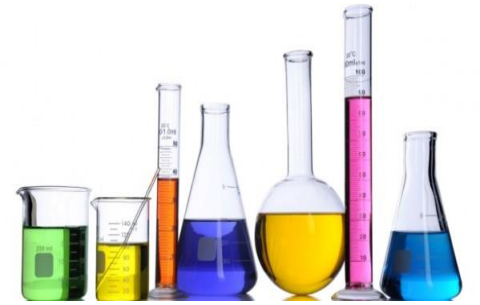
# Total Laboratory Automation for Mass Spectrometry

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# CURRENTLY AVAILABLE PRODUCTS



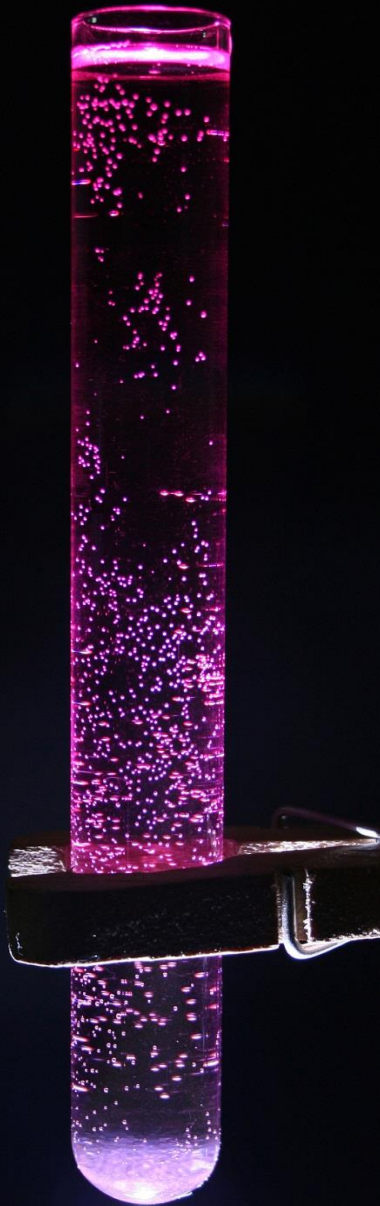


In preparative LC-MS/MS, the operators perform an initial extraction of the components of interest for use in analytical or in further laboratory tests.

This process needs to be extremely precise in order to assure appropriate recoveries and analytical performances

The process needs to be flexible in order to accept “home brewed” method and to be integrated with an IVD procedure.

Trueness and Accuracy are highly affected by the initial extraction procedures



The laboratory personell introduces the rack inside the robotic station, which through a bar code reader will identify and record the sample.

During the analysis stages, the operator can intervenes deciding whether to discontinue operations to introduce samples for analysis in an emergency. Random access is necessary!

Each test tube is identified and recorded trough a bar code. The bar code reader moves simultaneously with the needles that take the sample, and the machine data records and further stores the sample.

Number of tests per  
time

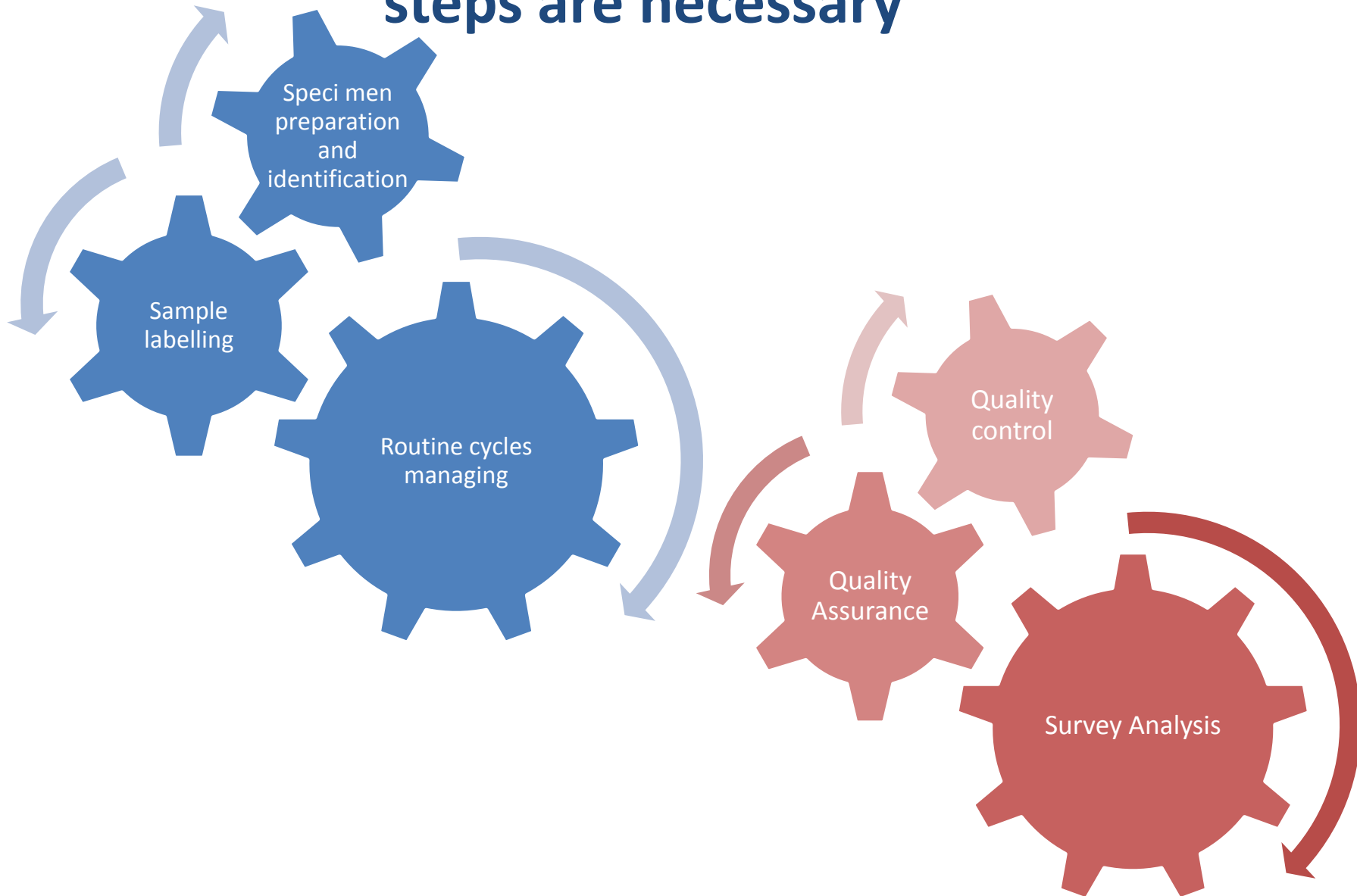
Minimize variations  
(human)

Automation

Minimize equipment  
variation

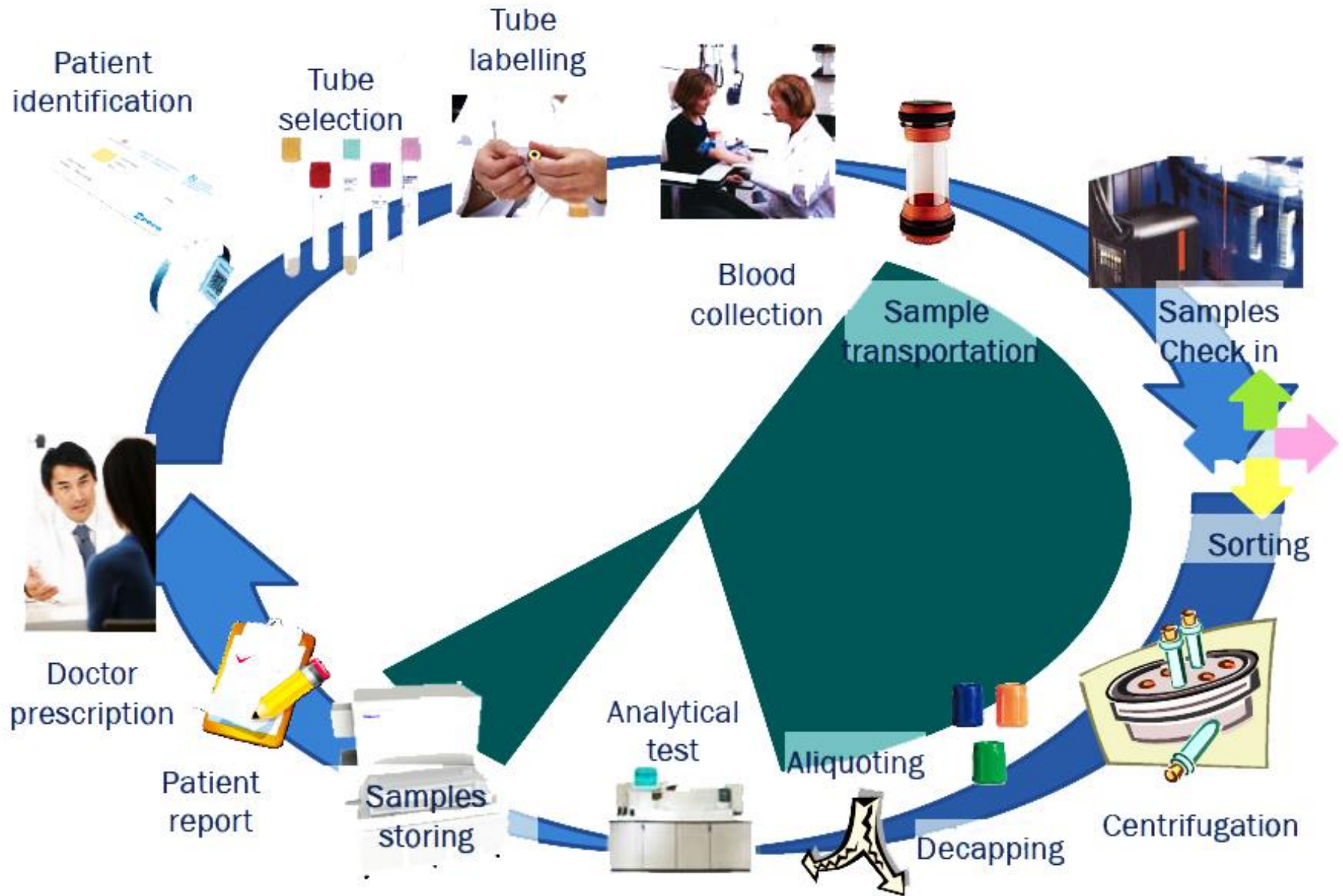
Minimize sample  
and reagent use

# With basic automation some fundamental steps are necessary

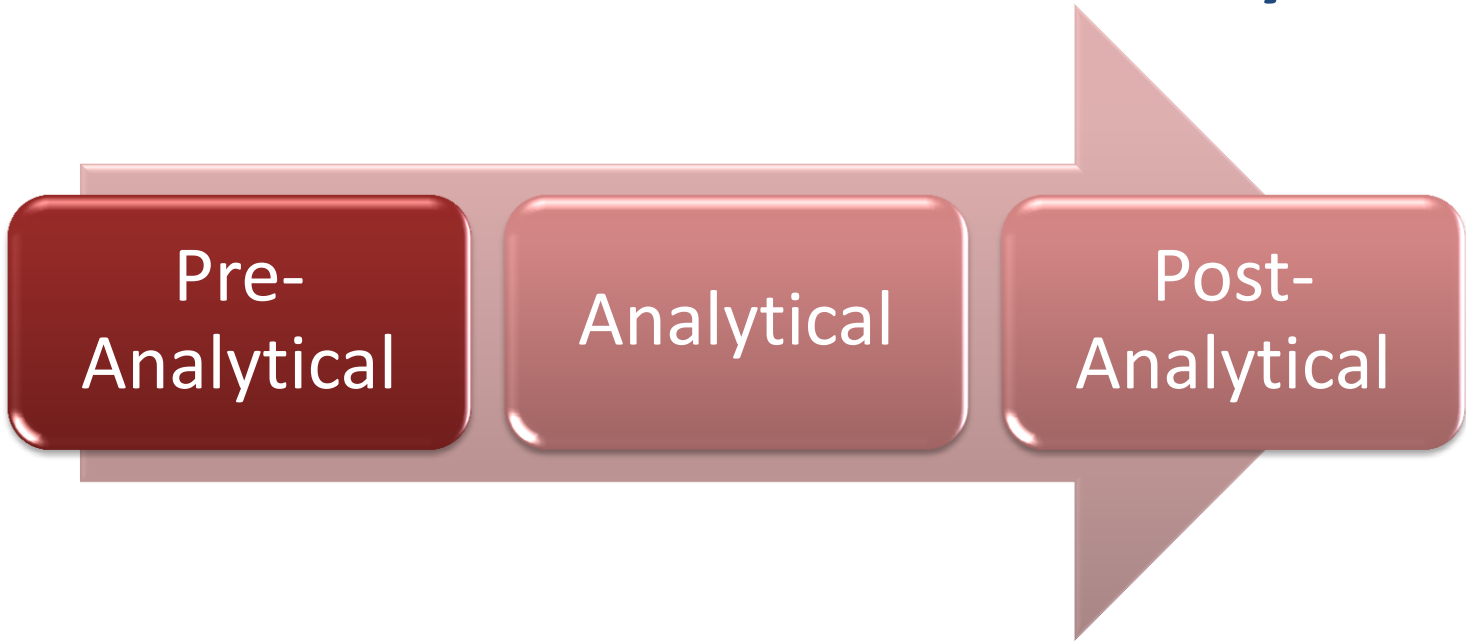




# Total Laboratory Automation



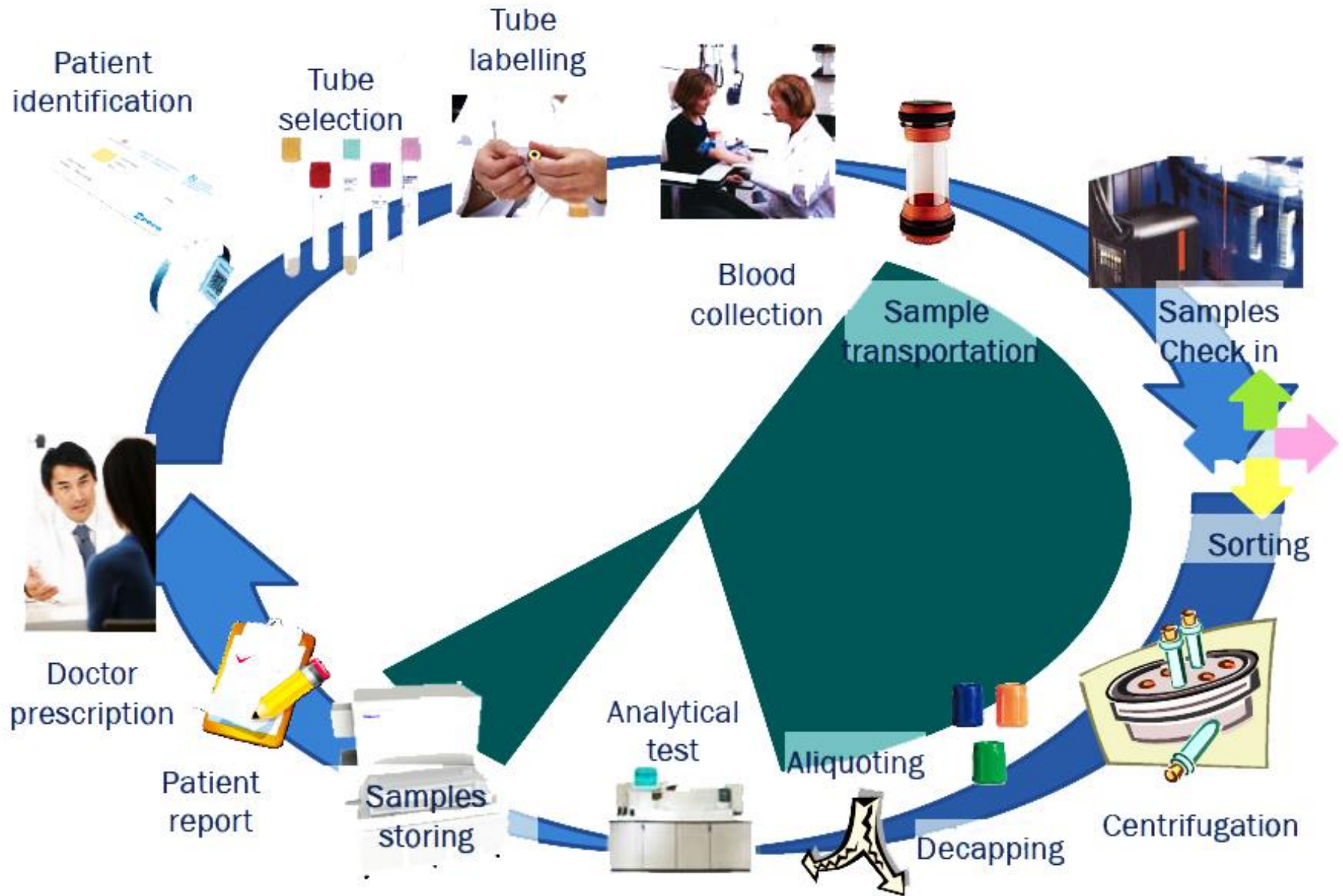
# Automation In Clinical Chemistry



- The process can be divided into three major phases—preanalytic, analytic, and postanalytic—corresponding to sample processing, chemical analysis, and data management, respectively.
- The analytic phase is the key feature of MS
- Further efforts are needed on increasing automation of the preanalytic and postanalytic processes.



# Total Laboratory Automation



# Total Laboratory Automation

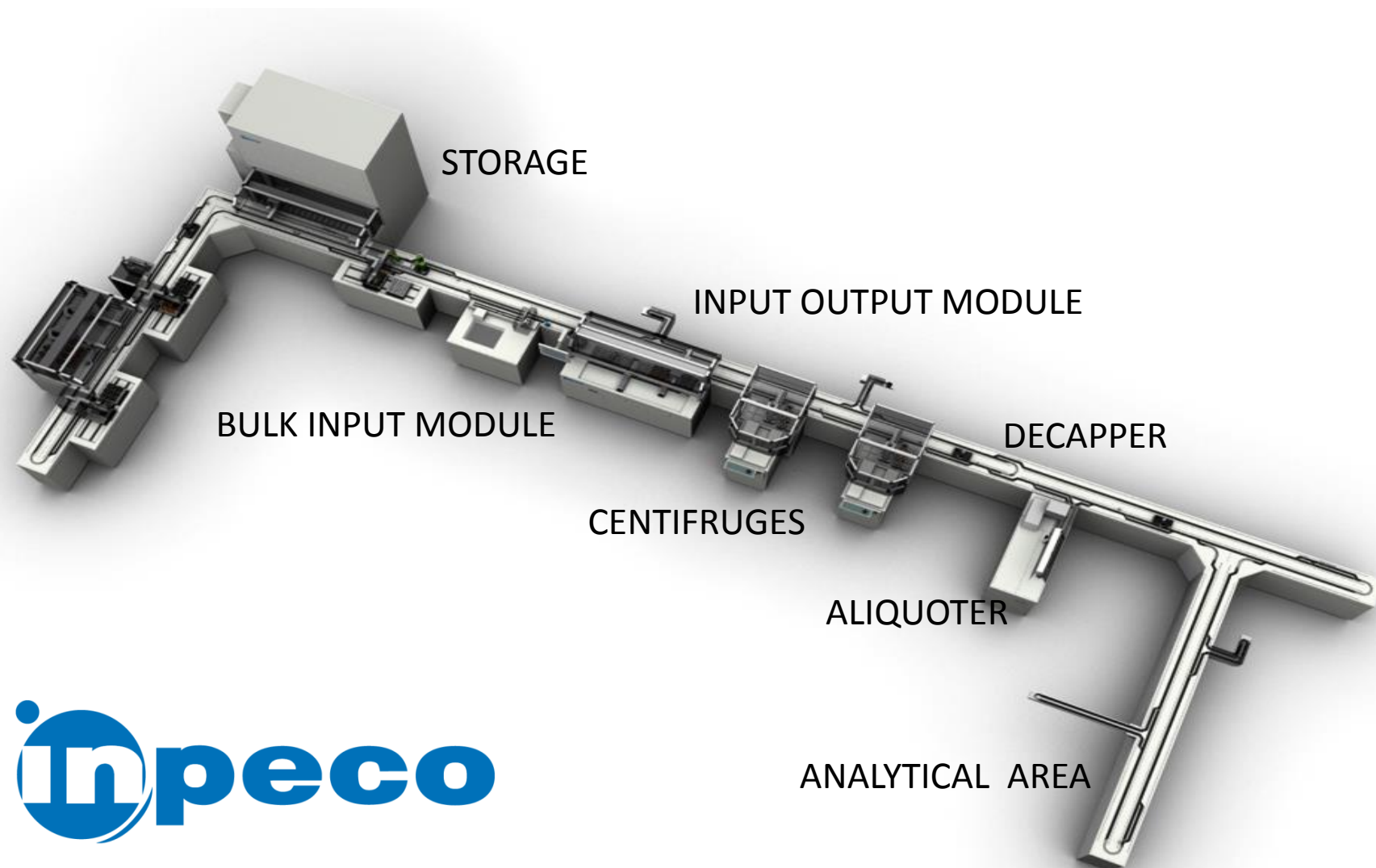
## Benefits

- ✓ Reduced manual intervention
- ✓ Avoid human errors
- ✓ Full traceability
- ✓ Enhance test results reproducibility
- ✓ Enhance sample integrity
- ✓ Enhance throughput
- ✓ Predictable and adjustable TAT
- ✓ Less aliquotes
- ✓ Less resources

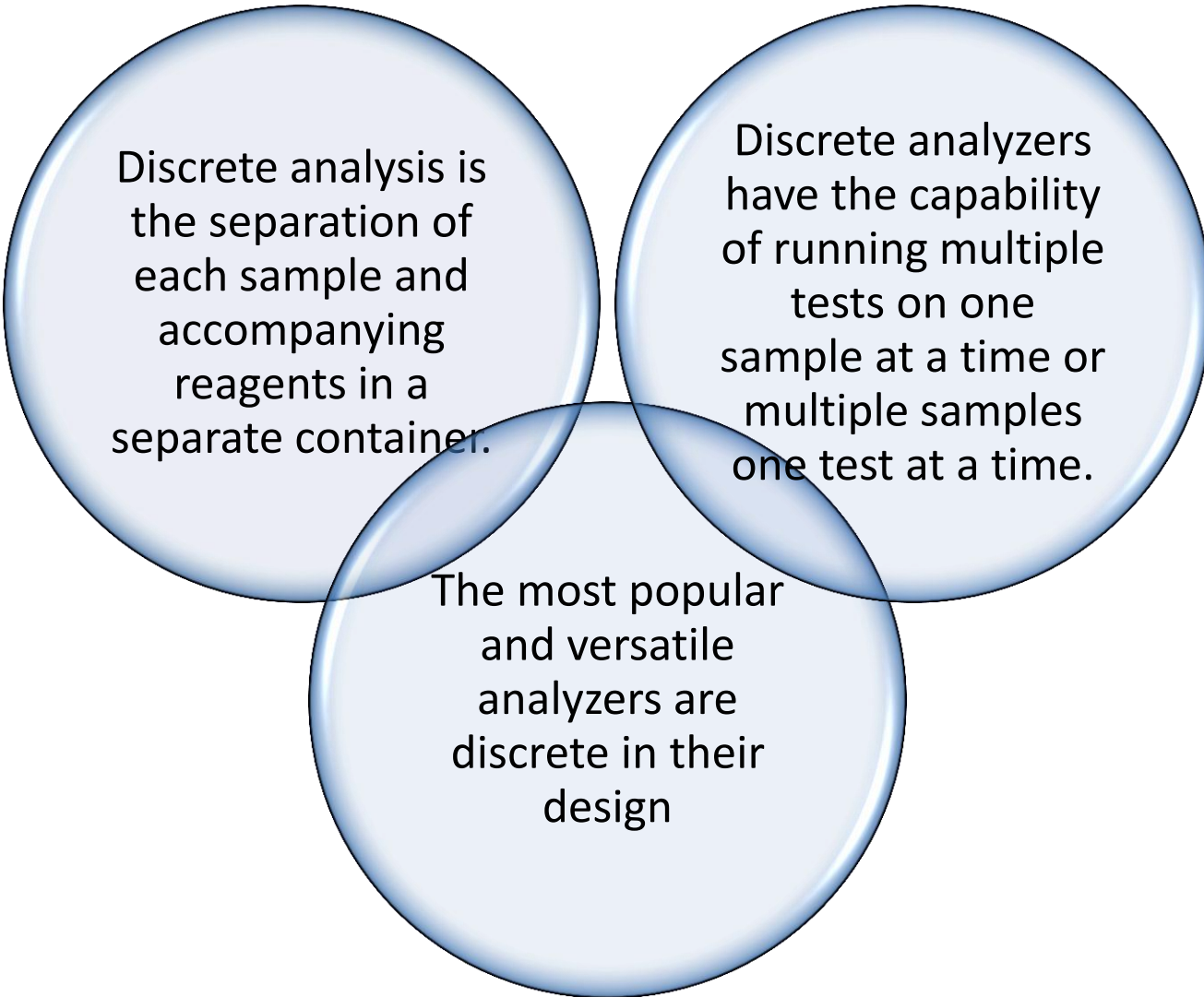
# Platform Selection – Fit for Purpose

- Workload evaluation and TAT
  - Random access or large batch testing?
  - Single instrument or multiples?
- Storage of reagents
  - Need refrigeration or freezing
  - Reagents stability

# TOTAL LABORATORY AUTOMATION



# Mass Specs are Discrete analyzers



Discrete analysis is the separation of each sample and accompanying reagents in a separate container.

Discrete analyzers have the capability of running multiple tests on one sample at a time or multiple samples one test at a time.

The most popular and versatile analyzers are discrete in their design

# Future Perspective

- **Discussion group on automation for clinical Mass Spectrometry**
- **Preparation of a concept paper highlighting the key-issues**