Midwest LRIG Rapid Fire

Solutions for Automated Liquid Handler Optimization

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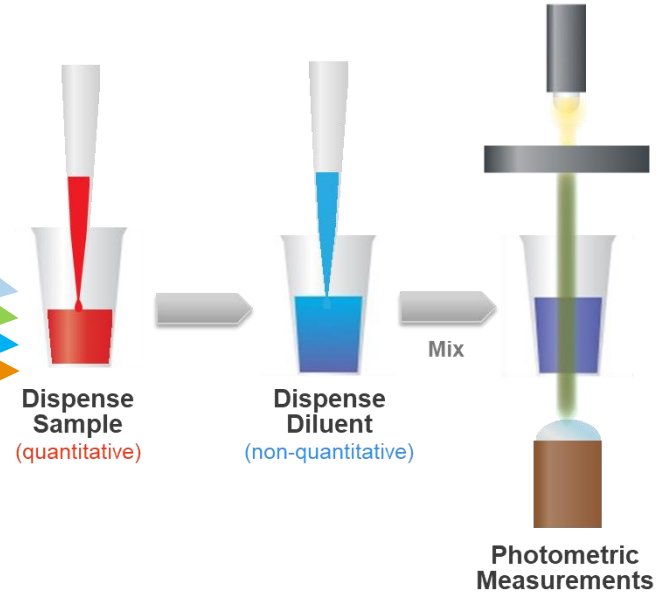
Global Standard for Liquid Handling Performance

MVS – Multichannel Verification System

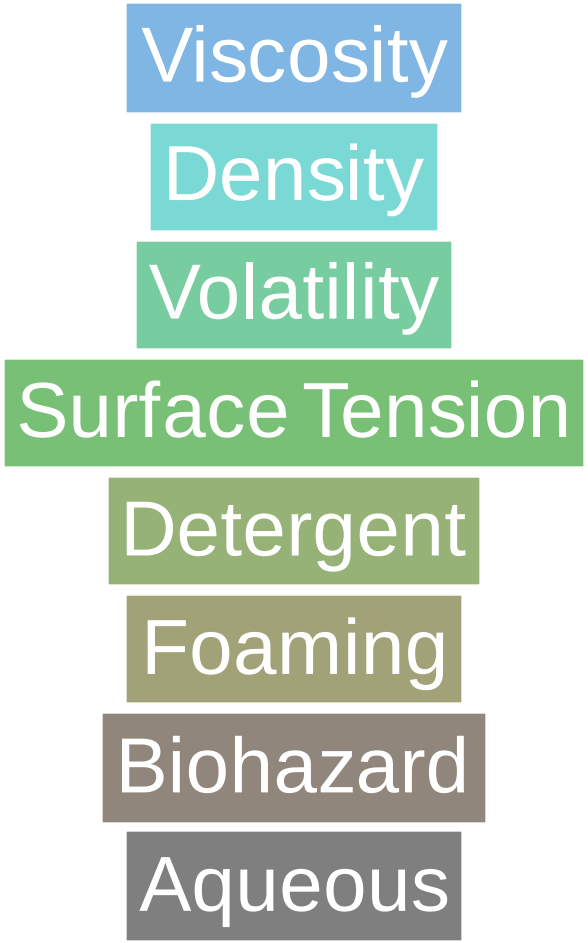
*Calibration, Verification, Operator Training and **Liquid Class Optimization***

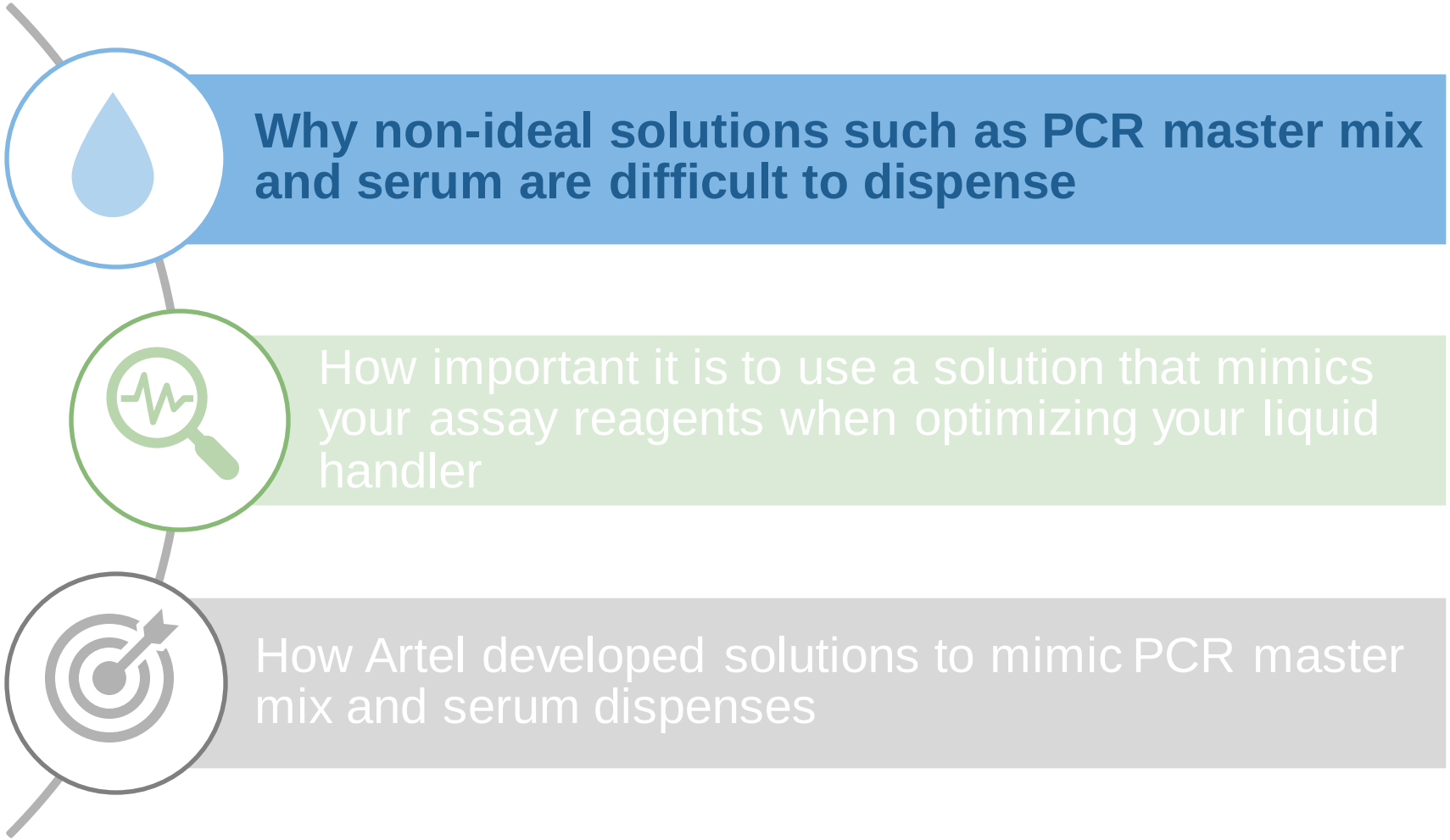
- To help you with your ALH optimization, there are 4 different QualAssure solutions, so you can choose the ones that best mimic your liquid types:
  - Aqueous
  - DMSO
  - PCRMix
  - SerumSub



Why Perform Liquid Class Optimization

Reagents and Samples are Characterized by their physical properties (liquid class parameters)




Why non-ideal solutions such as PCR master mix and serum are difficult to dispense
How important it is to use a solution that mimics your assay reagents when optimizing your liquid handler
How Artel developed solutions to mimic PCR master mix and serum dispenses

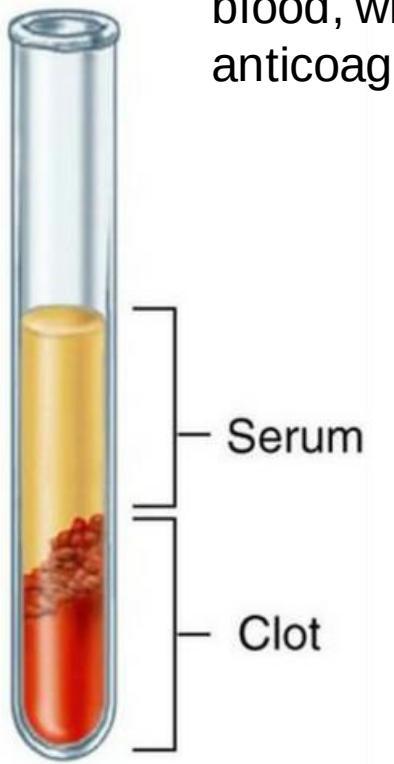
Not all liquids behave the same

Many parameters affect pipettability

- Viscous
- Dense
- Vapor Pressure
- Volatile
- Detergent
- Volume dependent
- Foaming
- Surface Tension

What is serum?

- **What is it?**
  - The fluid obtained after the complete coagulation of the blood, without adding an anticoagulating agent.



- **What's in it?**
  - Glucose → Increases viscosity
  - Hemoglobin
  - Albumin (~50%) → Protein, reduces surface tension
  - Immunoglobulins (~35%)
  - Cholesterol → Increases stickiness
  - Triglycerides
  - Sodium
  - Calcium
  - Chloride
  - Potassium
  - And other components

High protein content increases bubbles and foaming

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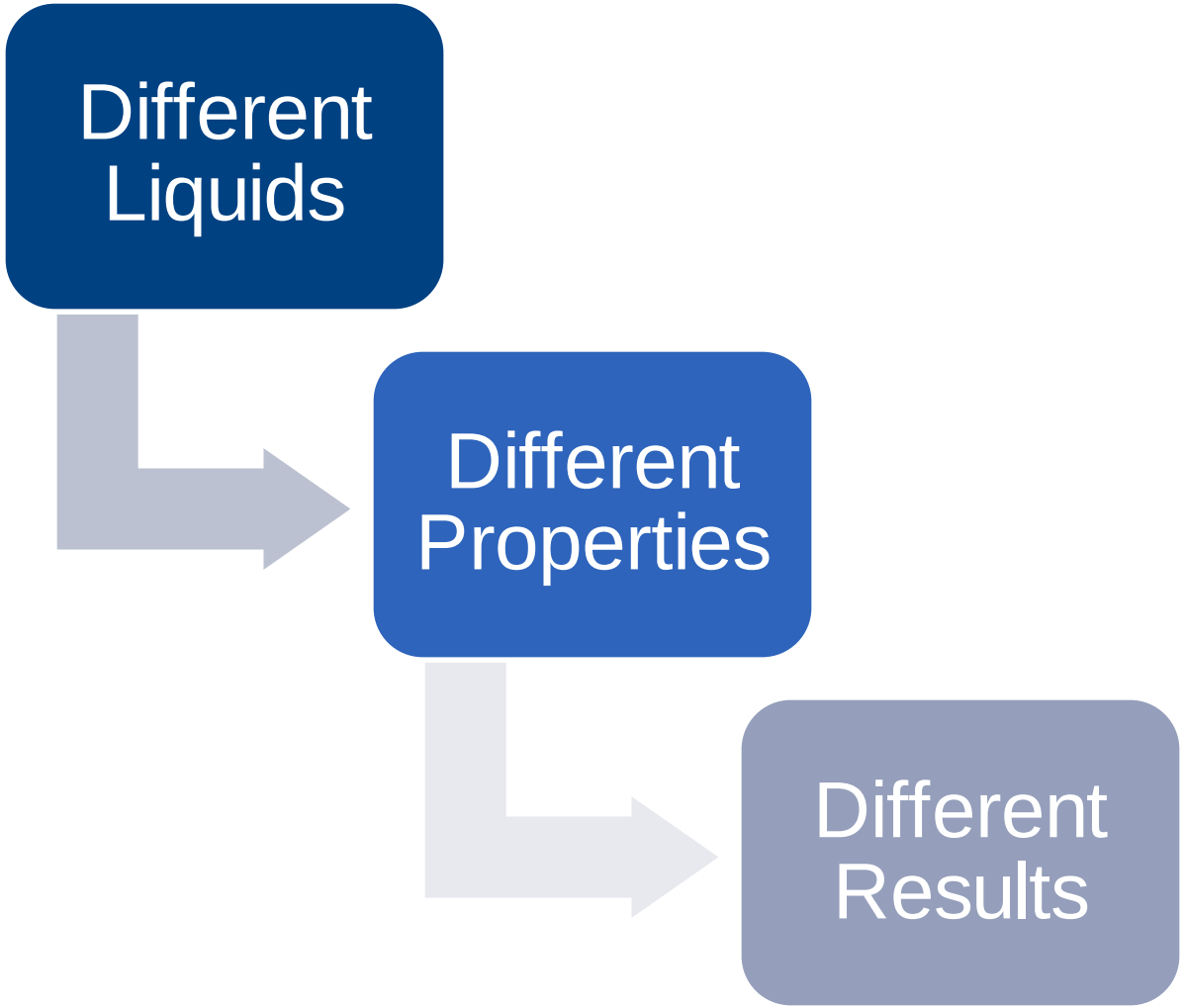
Poor Accuracy and Precision Impacts Assay Results



Benefits of Using SerumSub

- Most clinical samples require an extraction step and dilution step, so quantitative transfer is essential
- Limited availability of serum sample
- Increase the accuracy and precision of liquid transfers
- Speed up and improve development and transfer of assays
- Minimize false negatives and false positives
- Minimize overall assay variability
- Maximize data quality and reproducibility
- Ability to test assays daily.
- Improve efficiency by reducing assay transfer problems
- Liquid class optimization for automated liquid handlers

Process Optimization

Not all liquids are created equal

What is Liquid class optimization?

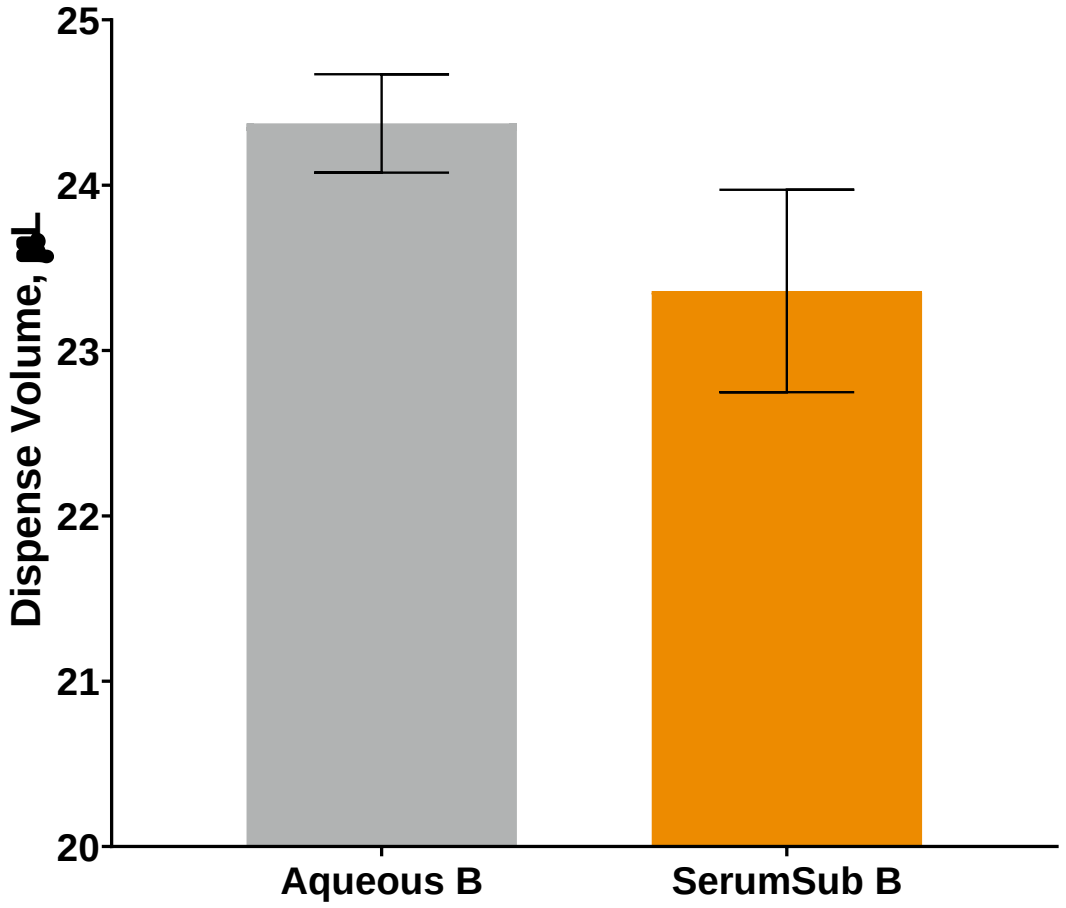
- Adjustment of any parameters on an automated liquid handler are intended to:
  - **increase** the accuracy and precision of liquid transfers
  - **decrease** variability of assay results and even false results.

Liquid Class Optimization

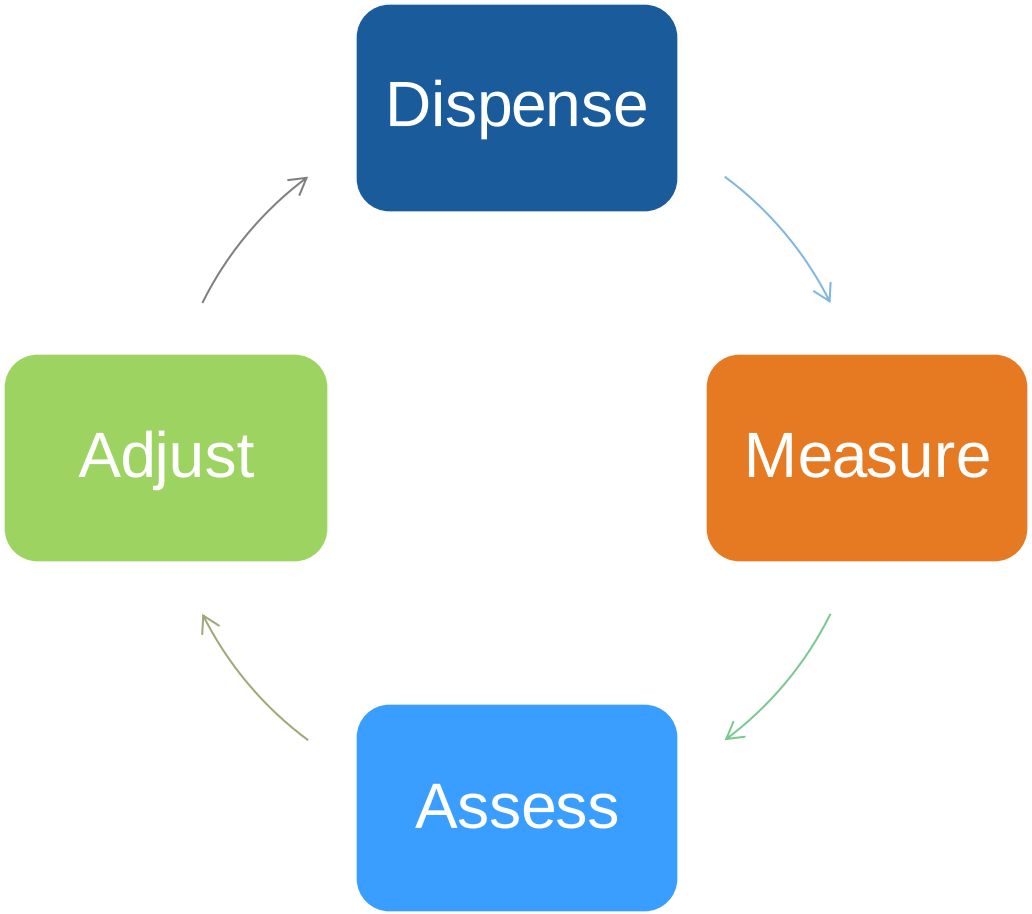
Before and After…

Aqueous Liquids vs Serum “like” Liquids

Serum and Aqueous liquids do not behave the same



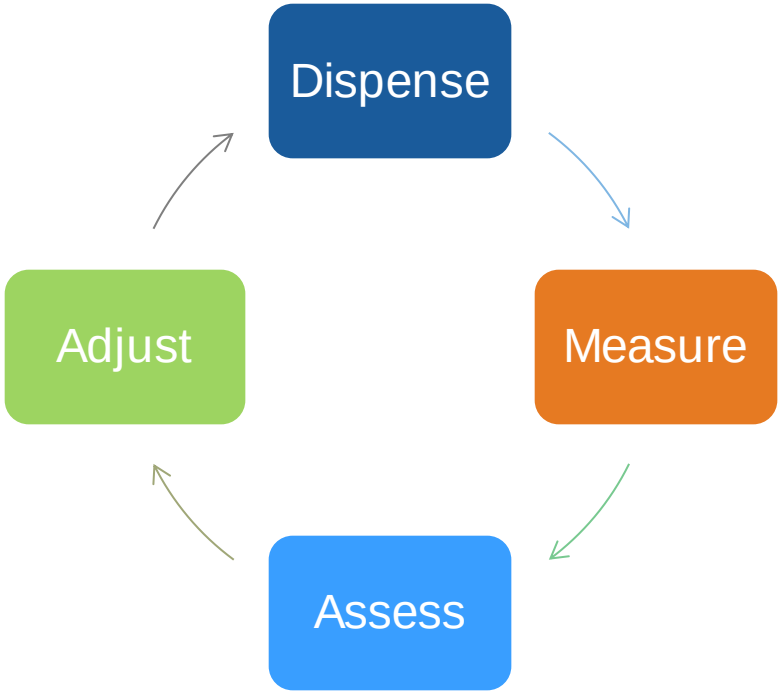
Liquid Class Optimization – Simplified



Liquid Class Recommendations for SerumSub

Start Here

- Use a slower aspiration & dispense speed
- Add or increase a pause/settling time
- Add tip touch
- Continue adjusting 1-2 parameters at a time until ideal settings are determined



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Equivalency Testing

A test to determine if one is like the other.

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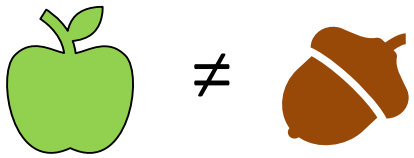

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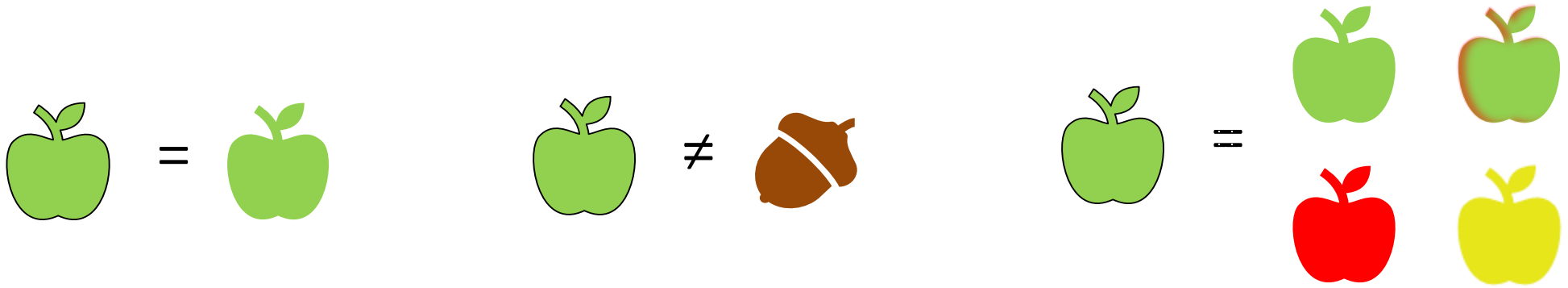
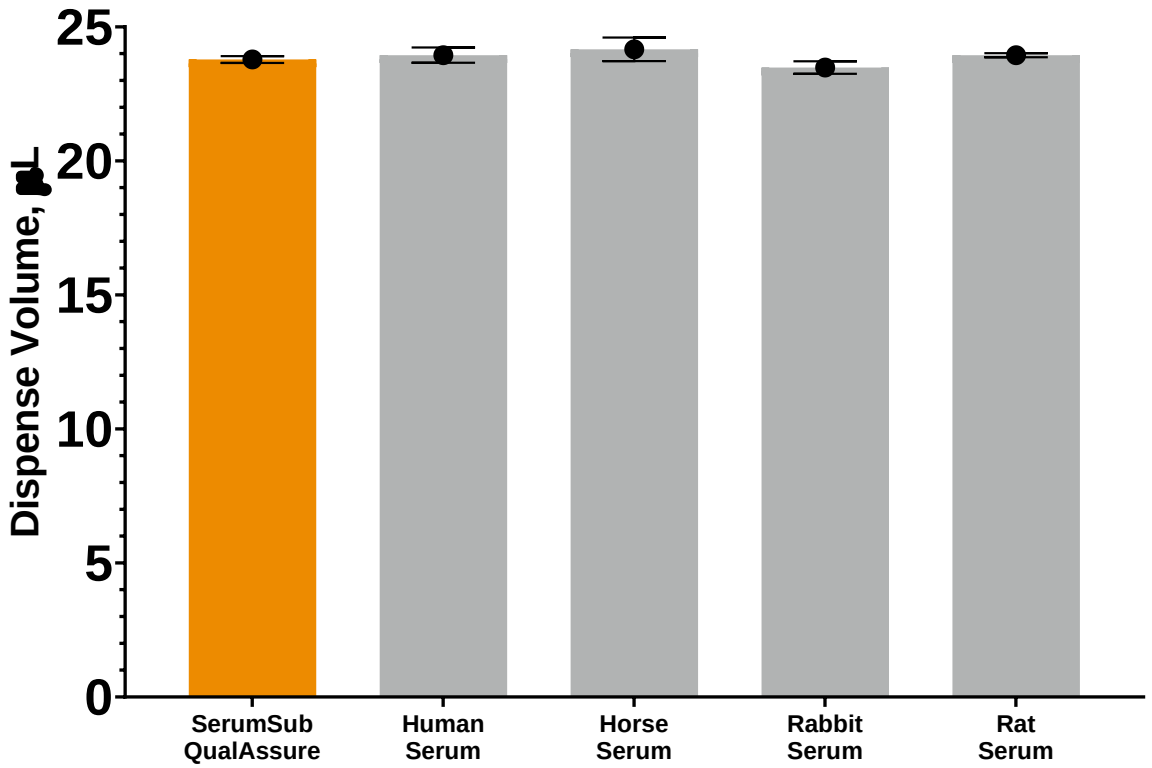
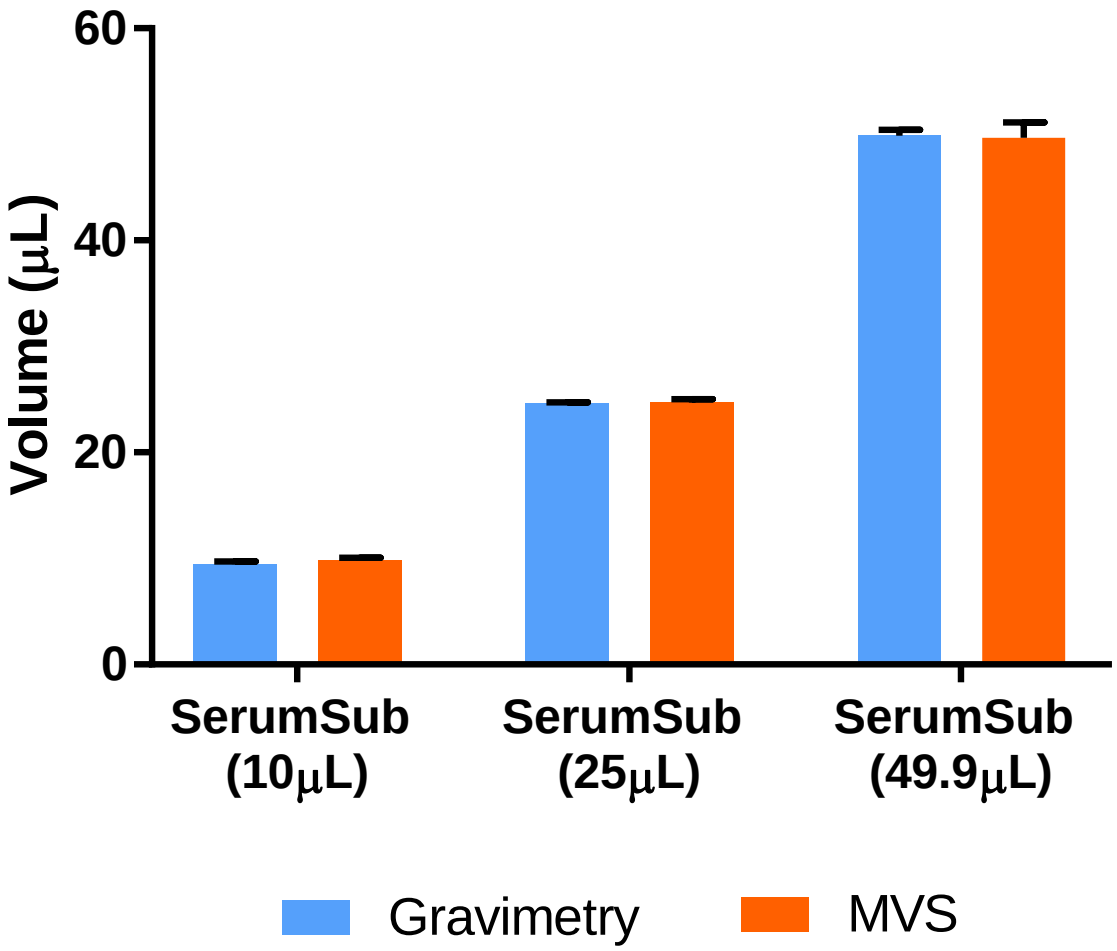


1. Identify different master mixes or sera to test.
2. Develop simple transfer method on an ALH.
3. Use gravimetry to measure and compare.

Comparison to Commercial Sera



- SerumSub mimics dispensing performance of various animal sera
- Allows users to simulate and optimize dispensing steps without wasting expensive reagents


60
40
20
0
Volume (µL)
SerumSub (10µL)
SerumSub (25µL)
SerumSub (49.9µL)
Gravimetry
MVS

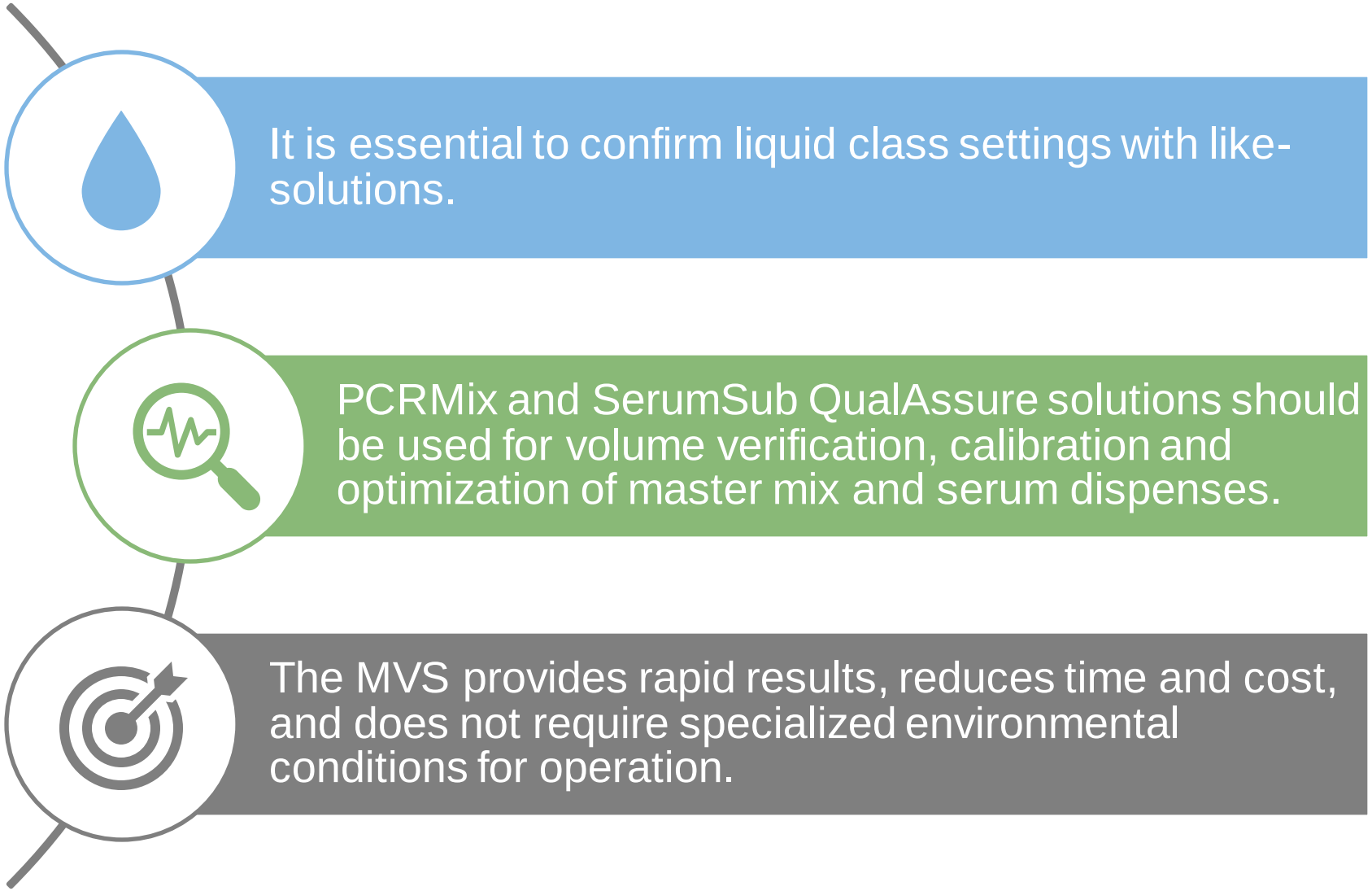
PCRMix

2 to 49.99 µL in 96-well plates

SerumSub

10 to 200 µL in 96-well plates

Summary



Thank you very much for your attention!

Contact me at: dcampbell@artel.co