Whole blood dilution for improving hemolysis-free blood separation

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Application - Increase the accessibility of blood-based clinical diagnostics through a portable and efficient microfluidic device.
cDNA for Point of Care Diagnostics
Device
Experimental Overview - Dilution of Whole Blood

- Controls
  - Positive - tradition cDNA extraction
  - Negative - running water through cDNA extraction
- Independent Variable
  - The process of cDNA extraction
- Dependent Variable
  - Dilution factors: 1:10, 1:100
- Confounding Variables
  - Dog
  - Age of Blood at the time of cDNA extraction
Qubit Fluorometric Quantitation
Agarose Gel Electrophoresis of DNA
Digital PCR

**Preparation**: gDNA, cDNA, RNA, plasma

**Distribution**: Sample partitioned into many reactions

**PCR reaction**: Positive reactions, Negative reactions

**Readout**: Absolute quantification
Digital PCR
Data

Ctrl Samples

Concentration of cDNA (ng/mL)

Patient 2
Patient 3
Patient 4
Patient 5
Data

1:10 NaCl Samples

cDNA Concentration (ng/mL)

Patient 1
Patient 2
Patient 2
Data

1:100 NaCl

cDNA Concentration (ng/mL)

Patient 1  Patient 2  Patient 2
Data

Expected vs Observed Trend

- Graph showing the trend of cDNA Concentration (ng/µL) vs Dilution Factors.
- The graph indicates a decreasing trend as the dilution factors increase from 1 to 0.01.
Conclusions

Diluting whole blood still leads to the lysing of cells due to shear.
Acknowledgments

Professor Iwjin De Vlaminck
Philip Burnham
Fanny Chen
Min Kim