



Enhancing efficiency in flow cytometry: automated data analysis with BD ElastiGate™ software

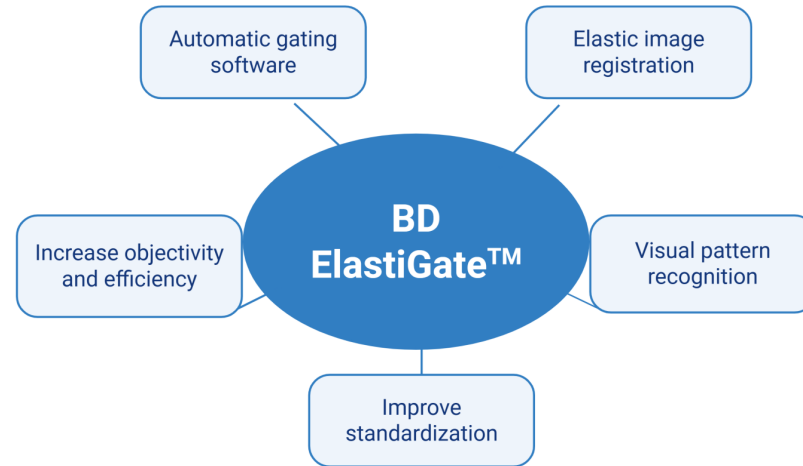
Bekemans Annabel^{1*}, Buysse Malicorne^{1*}, Vantrimpont Dielle², Bonroy Carolien¹, Hofmans Mattias¹

¹Ghent University Hospital, Department of Laboratory Medicine, Ghent, Belgium, ² University College Ghent, Department of Bio-medical Laboratory Technology

**Equally contributed first authors*

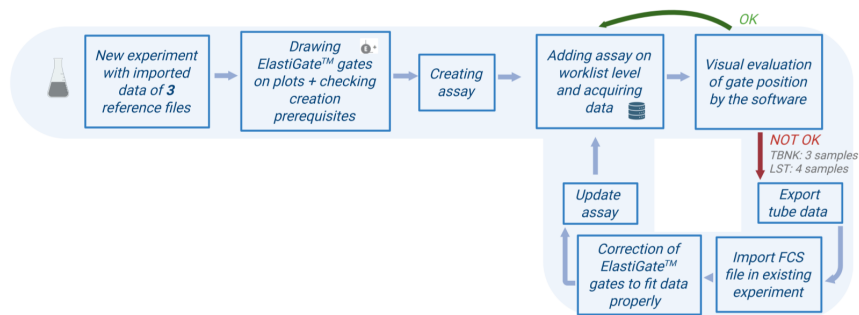
NVC – BSAC Symposium 11th-12th March 2026

INTRODUCTION

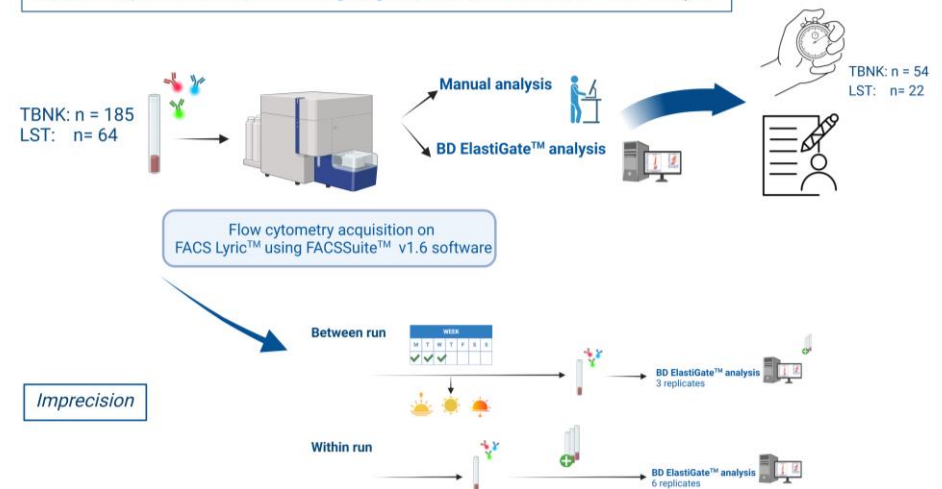


MATERIALS & METHODS

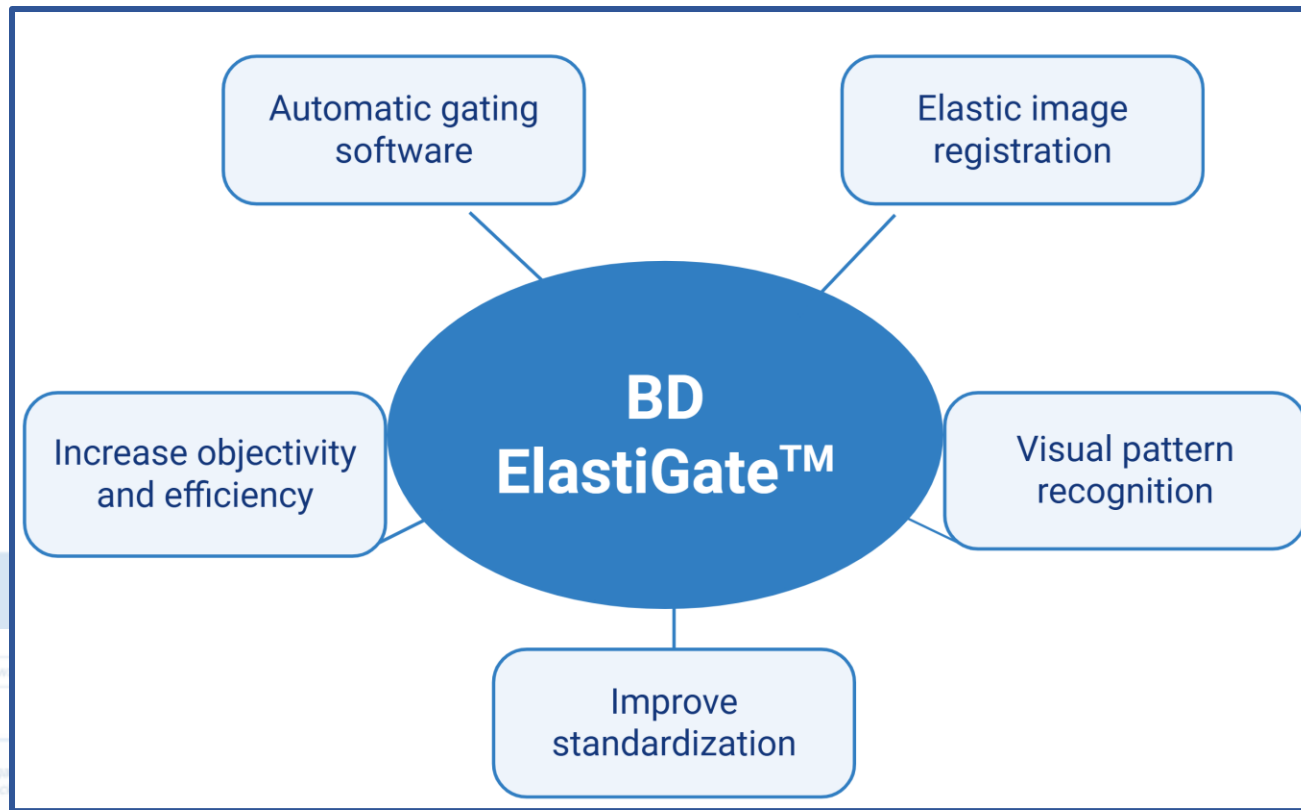
Workflow of ElastiGate™ assay design and software training.



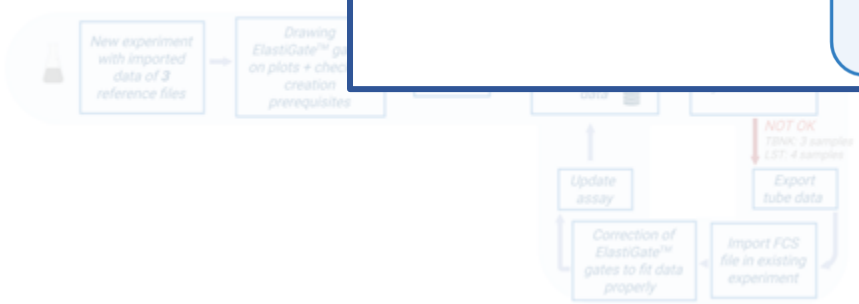
Method comparison of routine manual gating and automated ElastiGate™ data analysis



INTRODUCTION



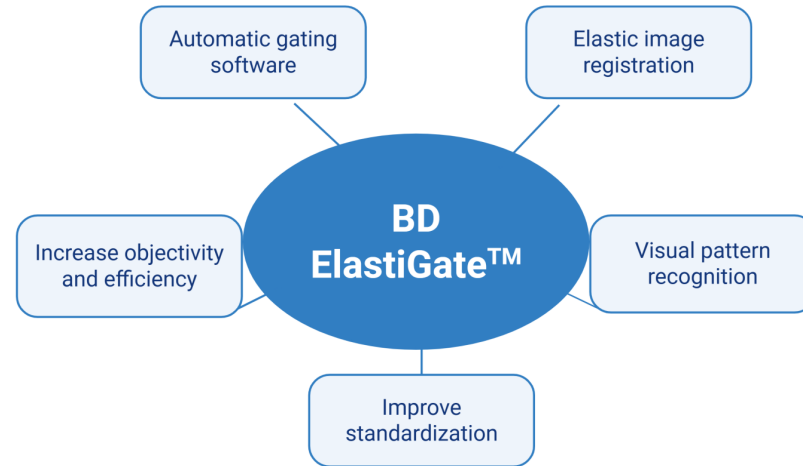
Workflow of ElastiGate™ assay design and software



Imprecision

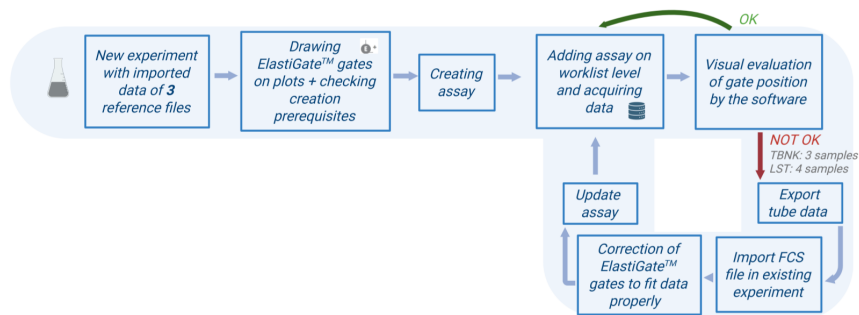


INTRODUCTION

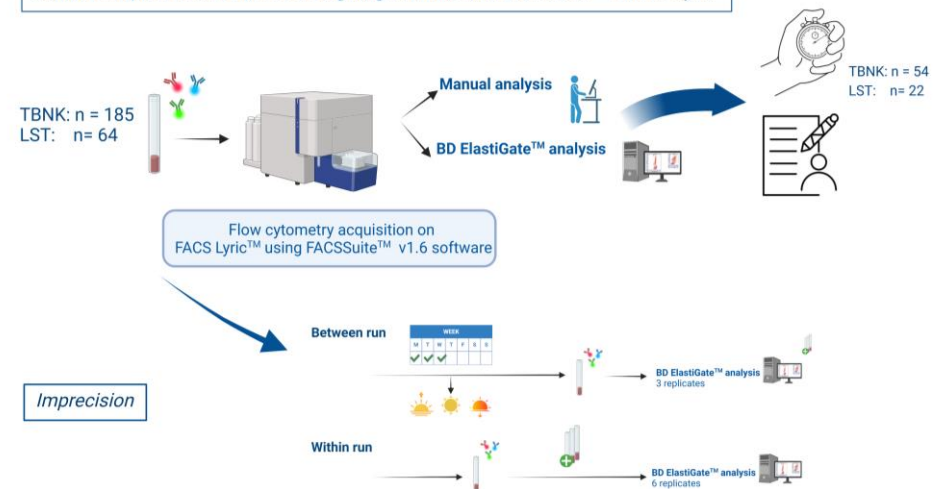


MATERIALS & METHODS

Workflow of ElastiGate™ assay design and software training.



Method comparison of routine manual gating and automated ElastiGate™ data analysis

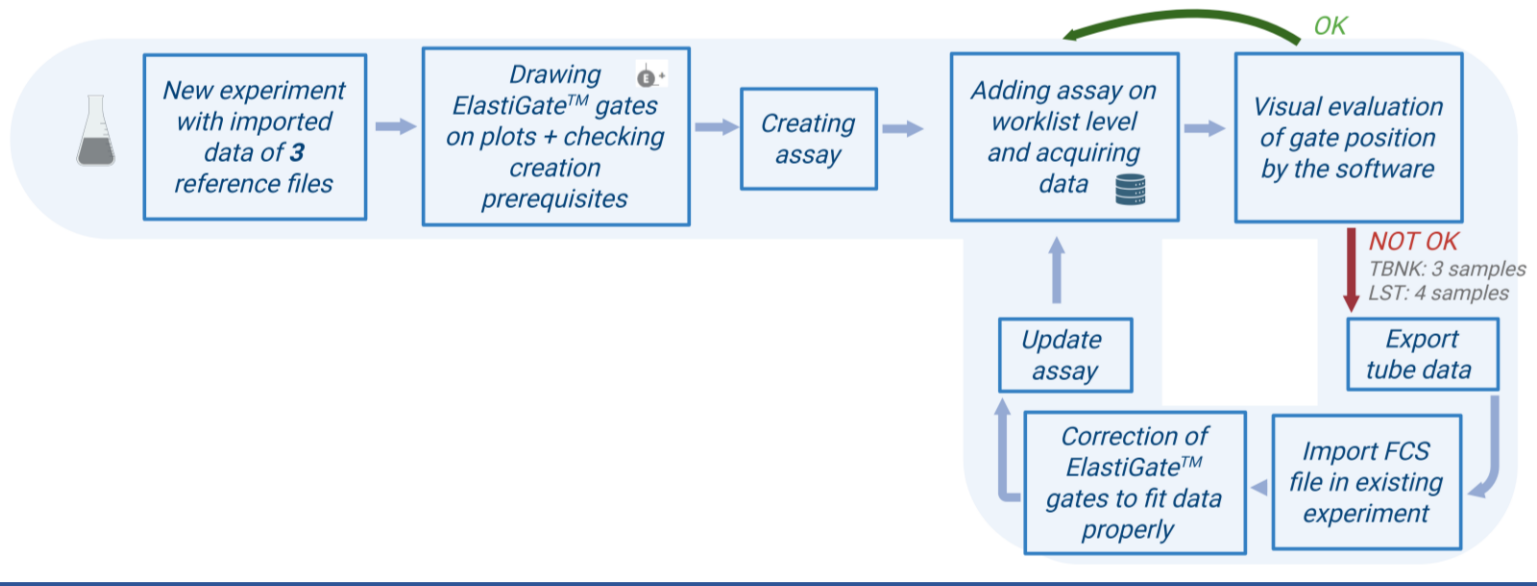


INTRODUCTION

Automatic gating software

Elastic image registration

Workflow of ElastiGate™ assay design and software training.



TBNK: n = 54
LST: n = 22

Imprecision

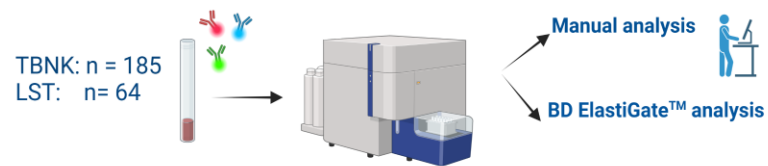


INTRODUCTION

Automatic gating software

Elastic image registration

Method comparison of routine manual gating and automated *ElastiGate™* data analysis



Flow cytometry acquisition on FACS Lyric™ using FACSSuite™ v1.6 software

Workflow of *ElastiGate™* assay design and software training



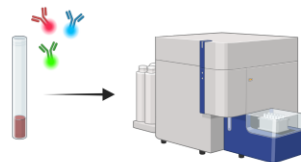
INTRODUCTION

Automatic gating software

Elastic image registration

Method comparison of routine manual gating and automated ElastiGate™ data analysis

TBNK: n = 185
LST: n = 64



Flow cytometry acquisition on FACS Lyric™ using FACSSuite™ v1.6 software

Manual analysis



BD ElastiGate™ analysis



TBNK: n = 54
LST: n = 22



Workflow of ElastiGate™ assay design and software training

New experiment with imported data of 3 reference files

Drawing ElastiGate™ gates on plots + checking creation prerequisites

Correction of ElastiGate™ gates to fit data properly

Import FCS file in existing experiment

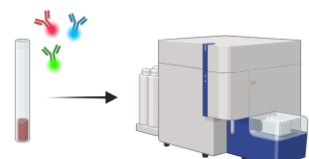
INTRODUCTION

Automatic gating software

Elastic image registration

Method comparison of routine manual gating and automated ElastiGate™ data analysis

TBNK: n = 185
LST: n = 64



Flow cytometry acquisition on FACS Lyric™ using FACSSuite™ v1.6 software

Manual analysis
BD ElastiGate™ analysis



TBNK: n = 54
LST: n = 22



Between run



BD ElastiGate™ analysis
3 replicates

Within run



BD ElastiGate™ analysis
6 replicates

Imprecision

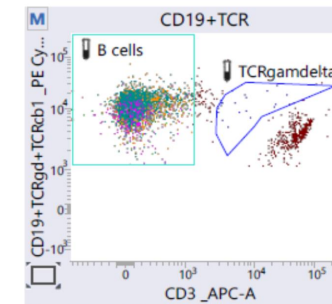
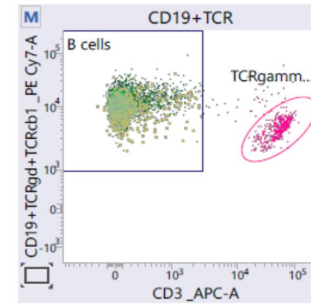
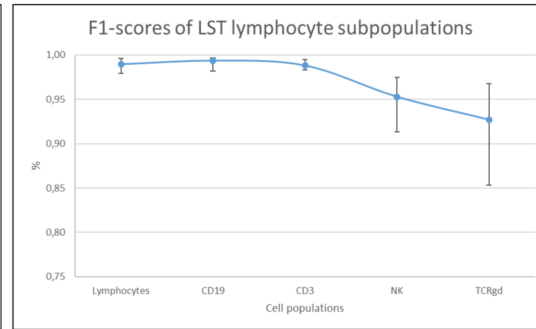
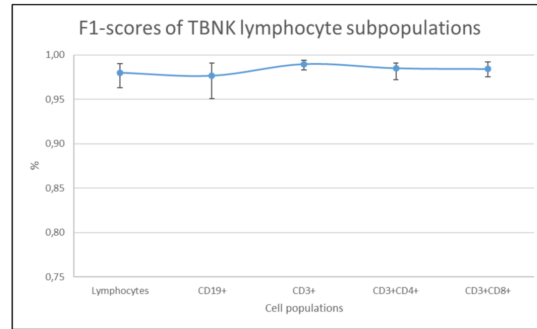
Workflow of ElastiGate™ assay design and software training

New experiment with imported data of 3 reference files

Drawing ElastiGate™ gates on plots + checking creation prerequisites



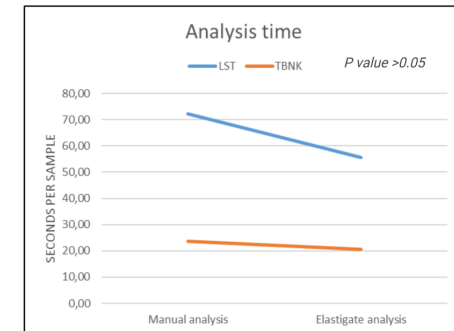
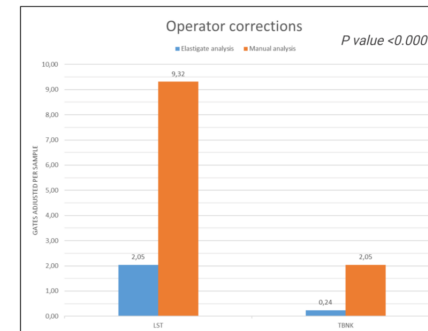
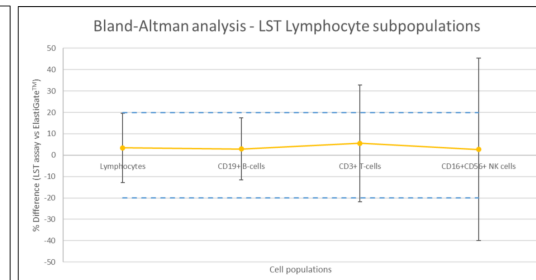
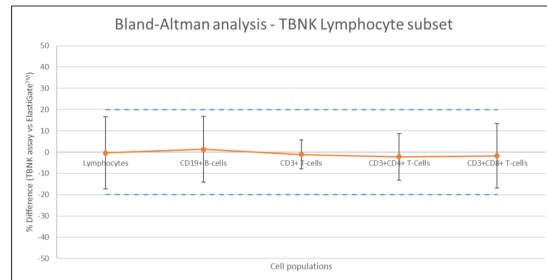
RESULTS



$$F_1 = 2 * \frac{\text{Precision} * \text{Recall}}{\text{Precision} + \text{Recall}}$$

$$\text{Precision} = \frac{TP}{TP + FP}$$

$$\text{Recall} = \frac{TP}{TP + FN}$$



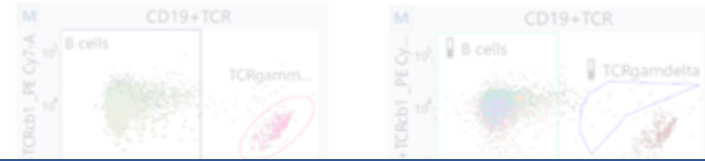
CONCLUSION

- ✓ Correct identification of major lymphocyte subpopulations.
- ✓ Reduced accuracy and imprecision for scarce cell populations
→ Expert review remains necessary
- ✓ Sample efficiency gain due to reduction in operator corrections.
- ✓ No significant time savings could be observed

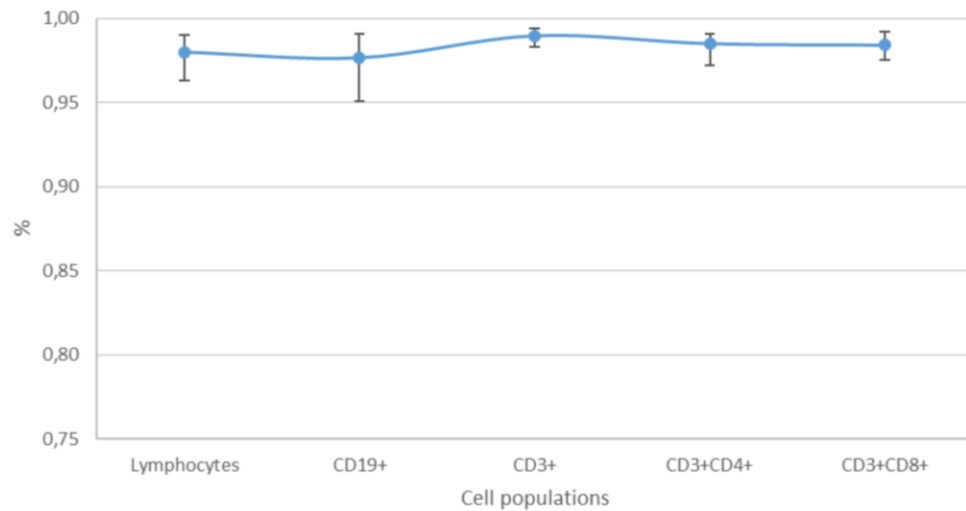
FUTURE

- Application of BD ElastiGate™ on:
- Clonality markers LST assay
 - Stem Cell Enumeration assay

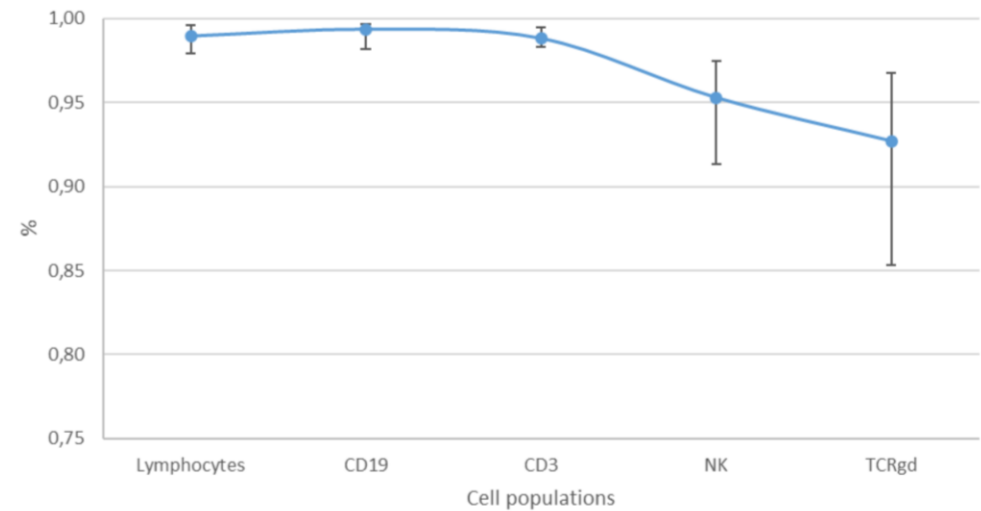
RESULTS



F1-scores of TBNK lymphocyte subpopulations



F1-scores of LST lymphocyte subpopulations



$$F_1 = 2 * \frac{Precision * Recall}{Precision + Recall}$$

$$Precision = \frac{TP}{TP + FP}$$

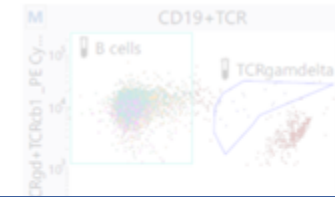
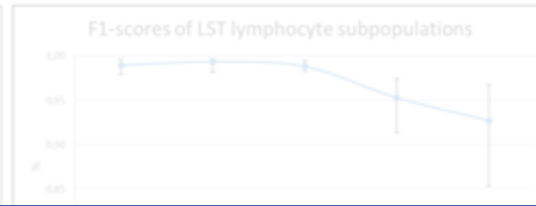
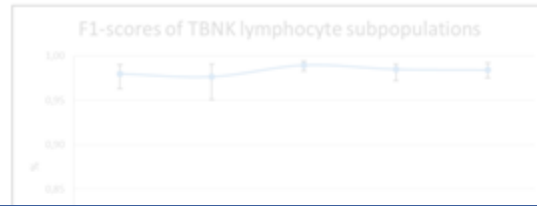
$$Recall = \frac{TP}{TP + FN}$$

→ Expert review remains necessary

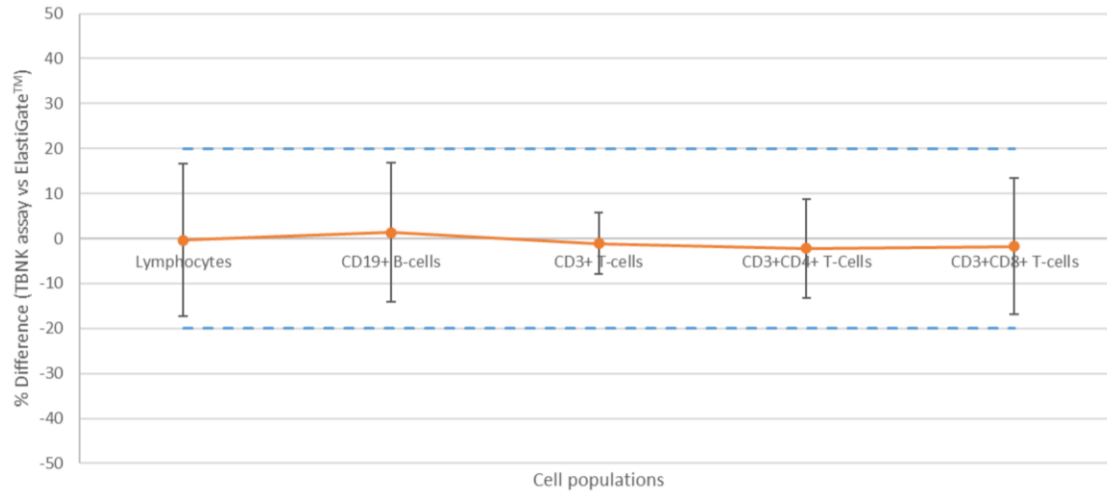
- ✓ Sample efficiency gain due to reduction in operator corrections.
- ✓ No significant time savings could be observed

- Clonality markers LST assay
- Stem Cell Enumeration assay

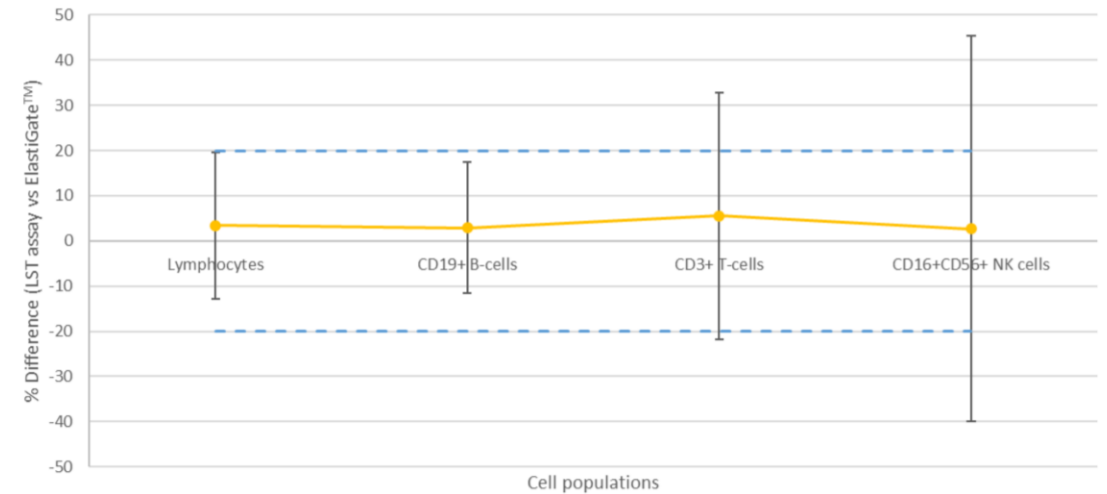
RESULTS



Bland-Altman analysis - TBNK Lymphocyte subset



Bland-Altman analysis - LST Lymphocyte subpopulations

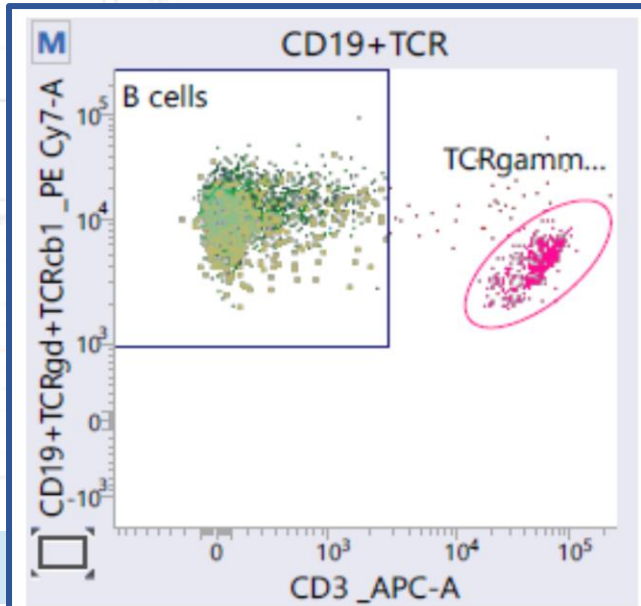
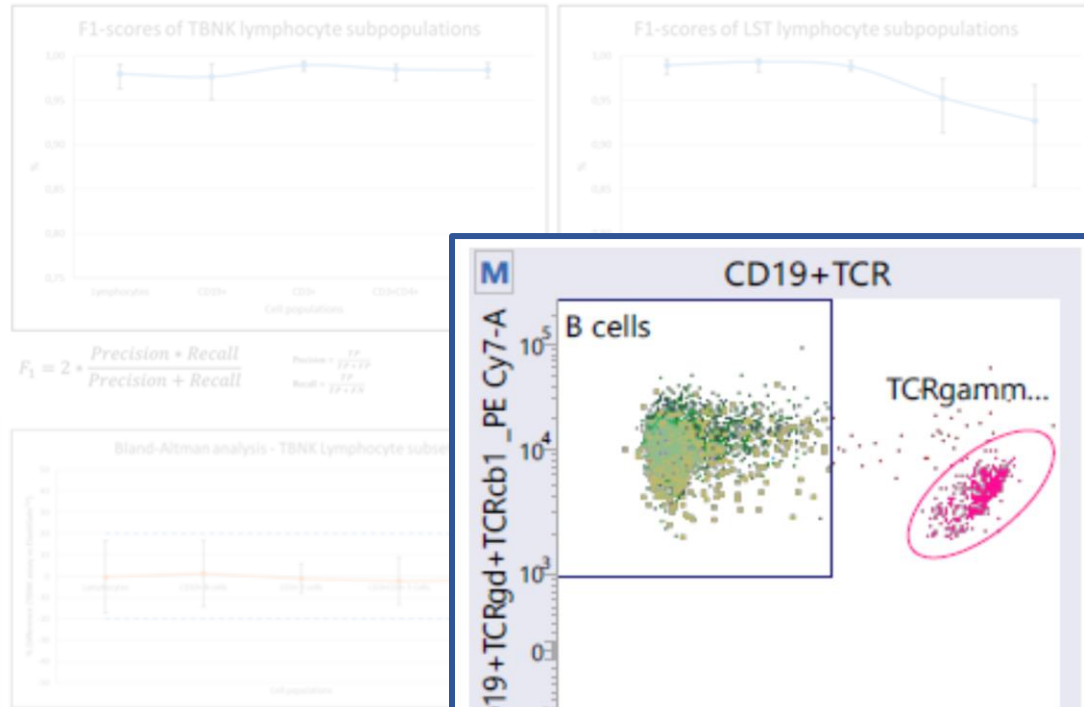


- ✓ Correct identification of major lymphocyte subpopulations.
- ✓ Reduced accuracy and imprecision for scarce cell populations
→ Expert review remains necessary
- ✓ Sample efficiency gain due to reduction in operator corrections.
- ✓ No significant time savings could be observed

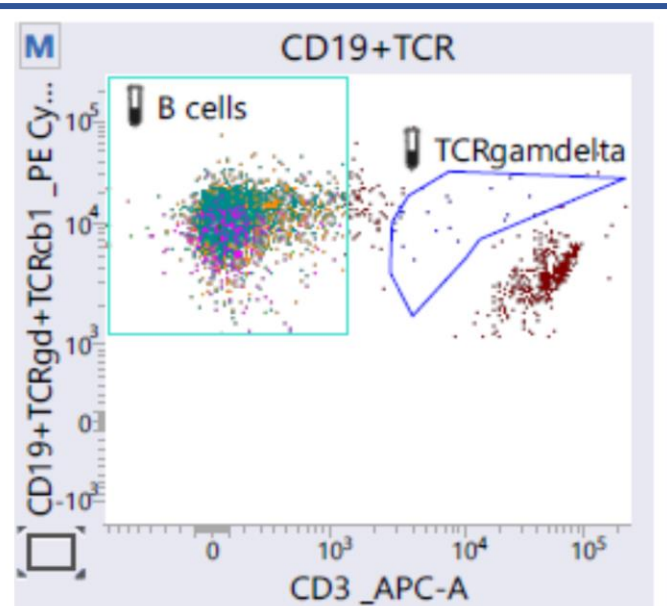
Application of BD ElastiGate™ on:

- Clonality markers LST assay
- Stem Cell Enumeration assay

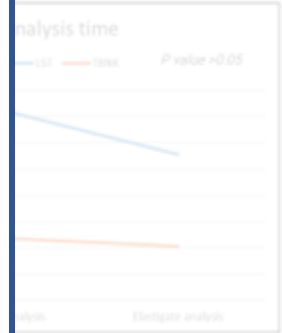
RESULTS



Manual analysis



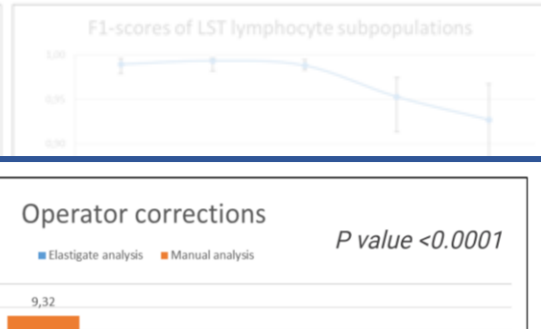
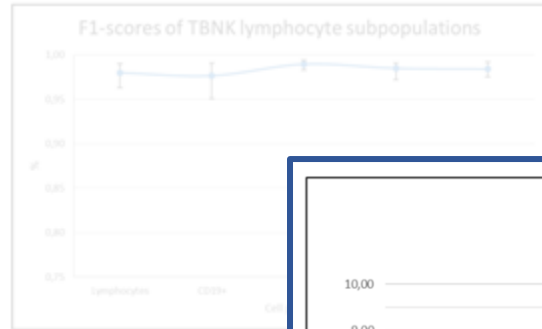
ElastiGate™ analysis



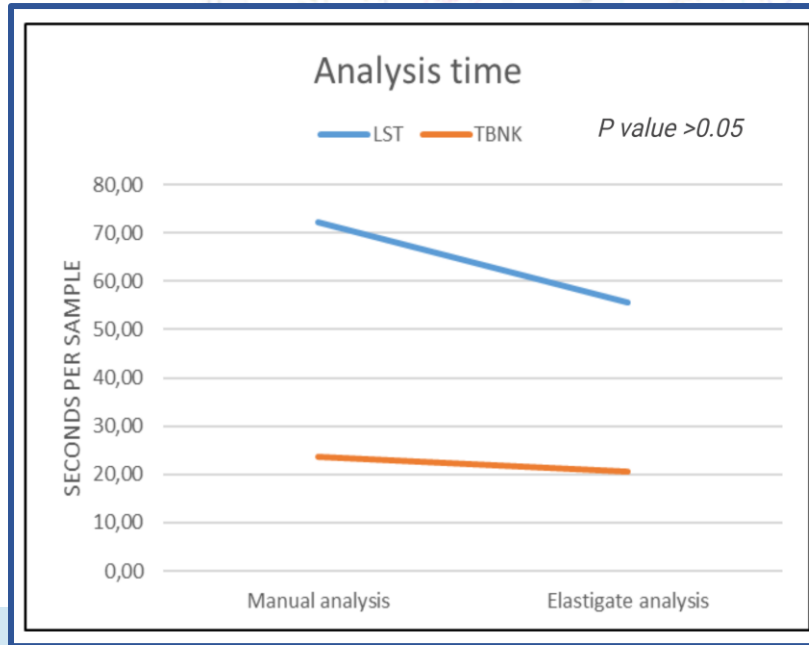
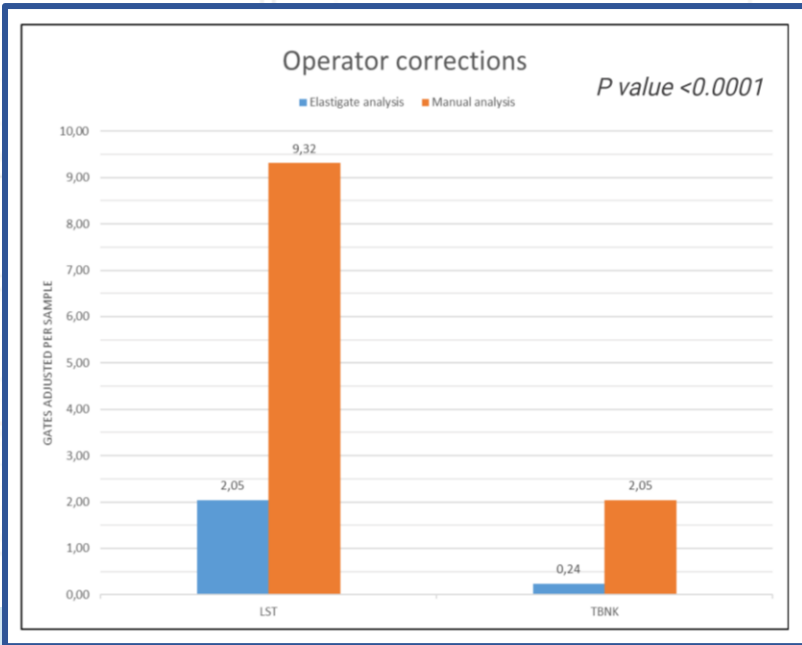
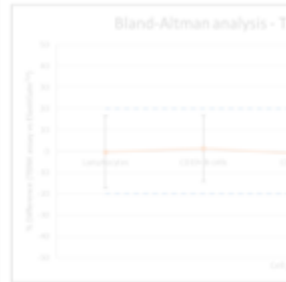
- ✓ Correct identification
- ✓ Reduced accuracy and imprecision for scarce cell populations
→ Expert review remains necessary
- ✓ Sample efficiency gain due to reduction in operator corrections.
- ✓ No significant time savings could be observed

- on: Elastigate™
- Clonality markers LST assay
 - Stem Cell Enumeration assay

RESULTS



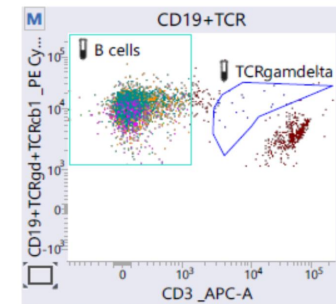
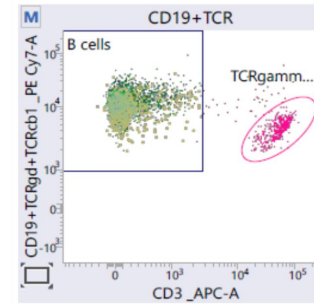
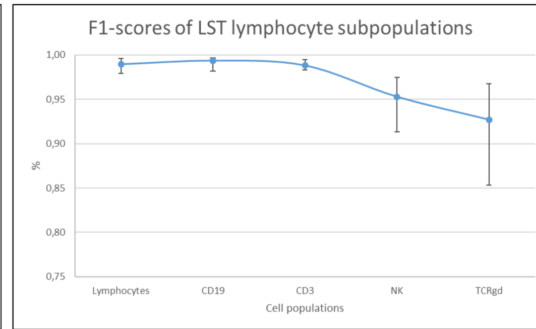
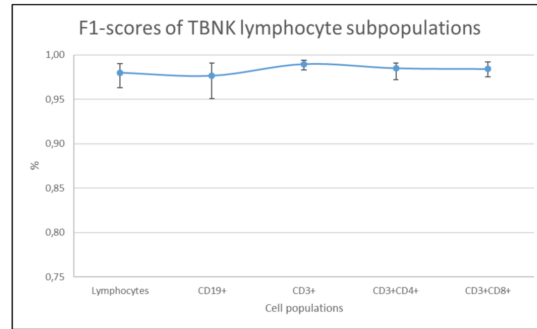
$$F_1 = 2 \cdot \frac{\text{Precision} \cdot \text{Recall}}{\text{Precision} + \text{Recall}}$$



- ✓ Correct identification of major lymphocyte subpopulations.
- ✓ Reduced accuracy and imprecision for scarce cell populations
→ Expert review remains necessary
- ✓ Sample efficiency gain due to reduction in operator corrections.
- ✓ No significant time savings could be observed

- Application of BD ElastiGate™ on:
- Clonality markers LST assay
 - Stem Cell Enumeration assay

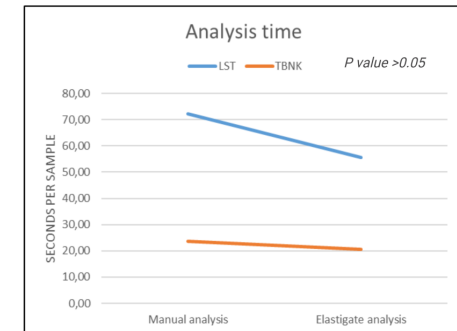
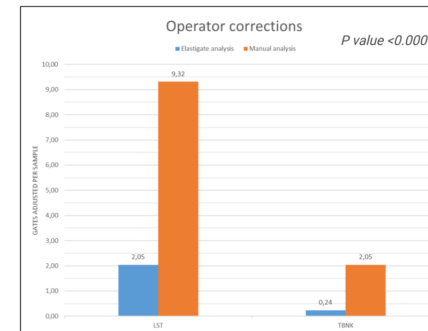
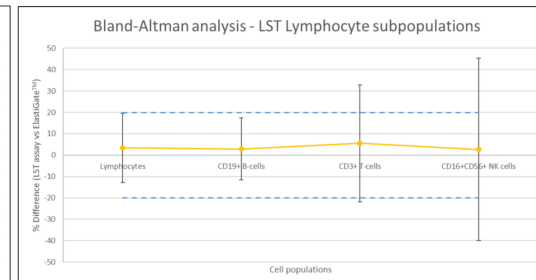
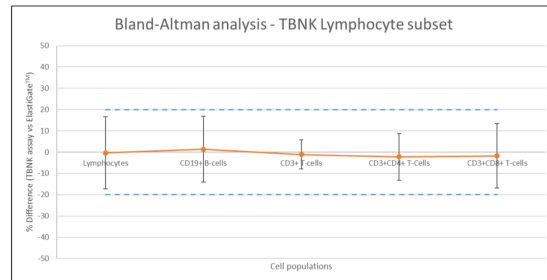
RESULTS



$$F_1 = 2 * \frac{\text{Precision} * \text{Recall}}{\text{Precision} + \text{Recall}}$$

$$\text{Precision} = \frac{TP}{TP + FP}$$

$$\text{Recall} = \frac{TP}{TP + FN}$$



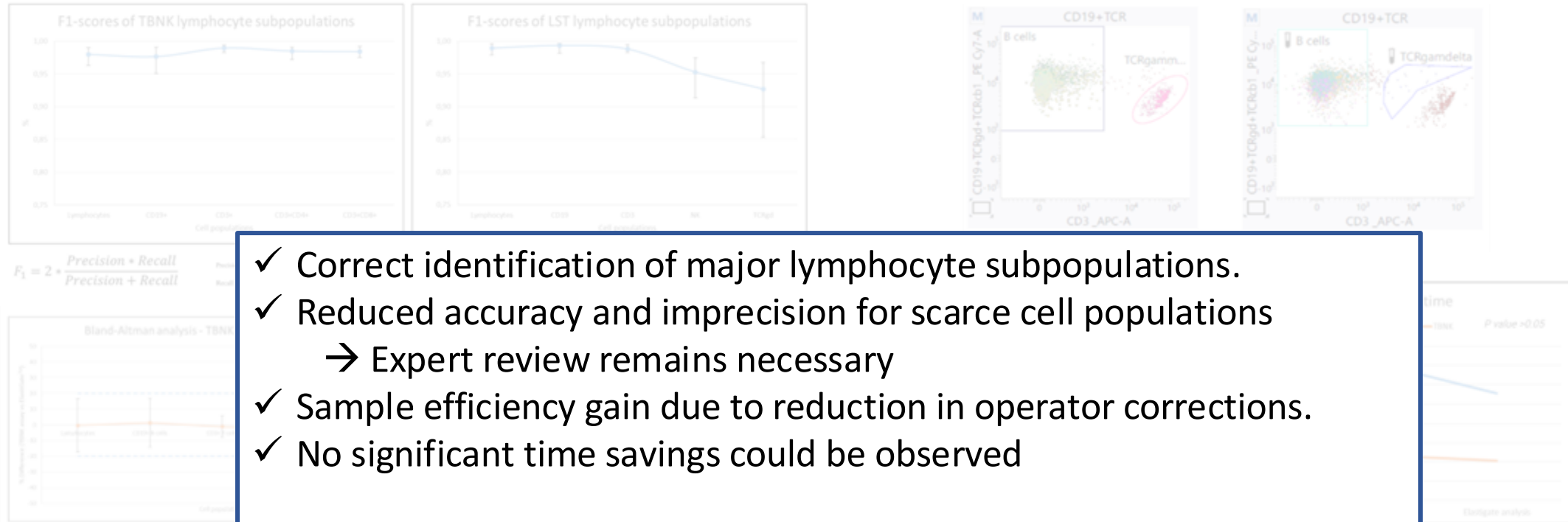
CONCLUSION

- ✓ Correct identification of major lymphocyte subpopulations.
- ✓ Reduced accuracy and imprecision for scarce cell populations
→ Expert review remains necessary
- ✓ Sample efficiency gain due to reduction in operator corrections.
- ✓ No significant time savings could be observed

FUTURE

- Application of BD ElastiGate™ on:
- Clonality markers LST assay
 - Stem Cell Enumeration assay

RESULTS



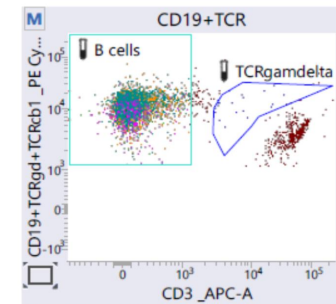
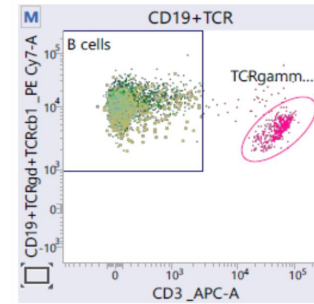
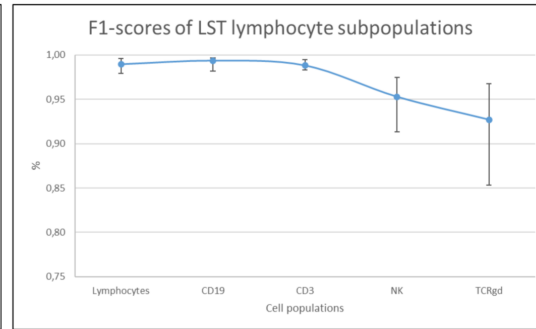
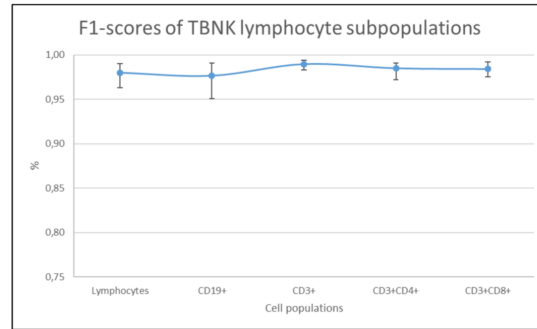
CONCLUSION

FUTURE

Application of BD ElastiGate™ on:

- Clonality markers LST assay
- Stem Cell Enumeration assay

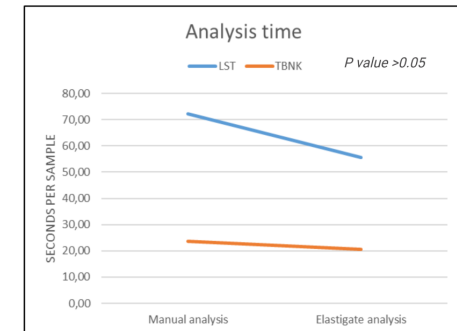
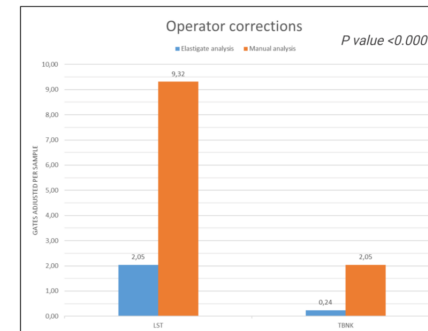
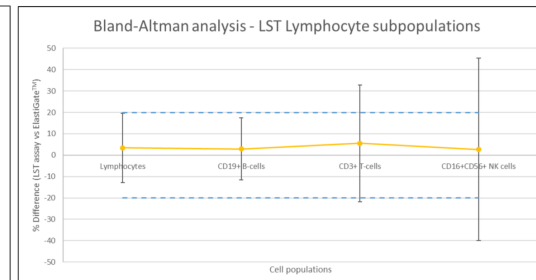
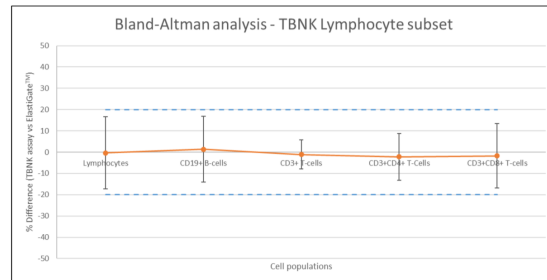
RESULTS



$$F_1 = 2 * \frac{\text{Precision} * \text{Recall}}{\text{Precision} + \text{Recall}}$$

$$\text{Precision} = \frac{TP}{TP + FP}$$

$$\text{Recall} = \frac{TP}{TP + FN}$$



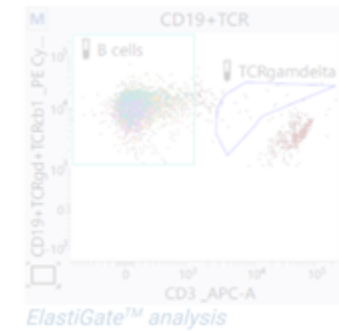
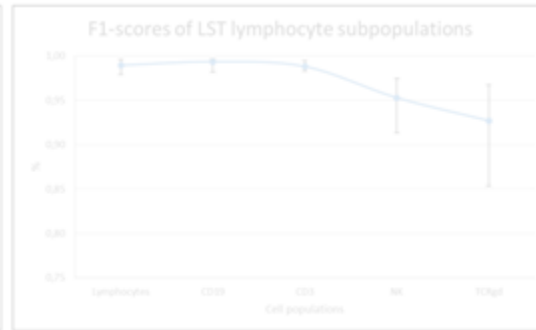
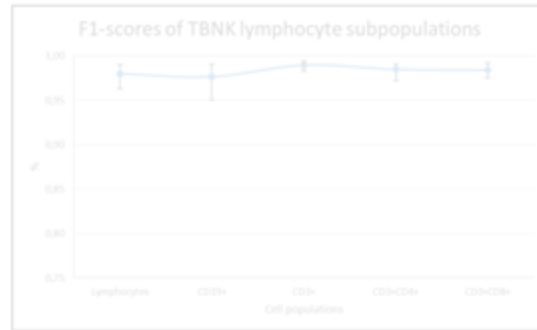
CONCLUSION

- ✓ Correct identification of major lymphocyte subpopulations.
- ✓ Reduced accuracy and imprecision for scarce cell populations
→ Expert review remains necessary
- ✓ Sample efficiency gain due to reduction in operator corrections.
- ✓ No significant time savings could be observed

FUTURE

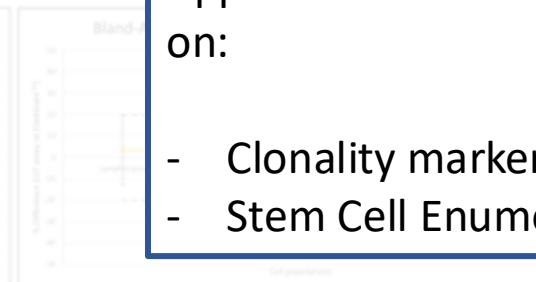
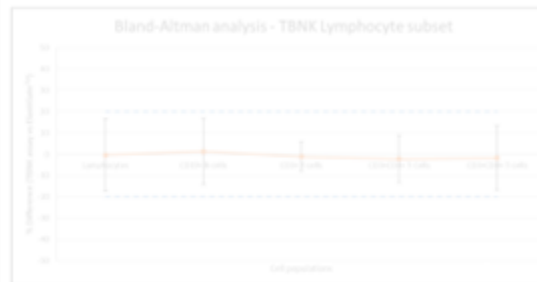
- Application of BD ElastiGate™ on:
- Clonality markers LST assay
 - Stem Cell Enumeration assay

RESULTS



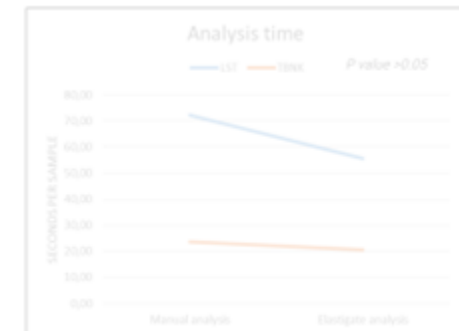
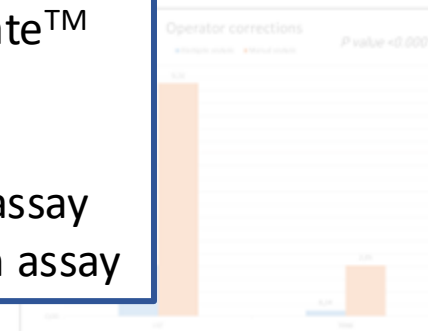
$$F_1 = 2 \cdot \frac{\text{Precision} \cdot \text{Recall}}{\text{Precision} + \text{Recall}}$$

Precision = $\frac{17}{17+19}$
Recall = $\frac{17}{17+24}$



Application of BD ElastiGate™ on:

- Clonality markers LST assay
- Stem Cell Enumeration assay



CONCLUSION

- ✓ Correct identification of major lymphocyte subpopulations.
- ✓ Reduced accuracy and imprecision for scarce cell populations
→ Expert review remains necessary
- ✓ Sample efficiency gain due to reduction in operator corrections.
- ✓ No significant time savings could be observed

FUTURE

✉ Annabel.bekemans@uzgent.be
Malicorne.buysse@uzgent.be

☎ +32 9 332 34 08

Department of Laboratory Medicine
Ghent University Hospital
Corneel Heymanslaan 10, 9000 Ghent, Belgium

