HCDM
CDMaps

CD Maps – Antigen Density Measurements of on Human Leukocytes

HCDM and CD nomenclature

Human **C**ell **D**ifferentiation **M**olecule:

- Independent, academic organisation which runs HLDA (Human Leucocyte Differentiation Antigens) Workshops and names and characterizes CD molecules.

- Nomenclature committee of the International Union of Immunological Societies (IUIS)

Presentation overview:

HCDM and expression data

Aims and scope

Approach

Expression Map - Selection of results

HLDA Workshops I-X (1982-2014)

Workshop		CDs assigned
I. Paris	1982	CD1-CDw15
II. Boston	1984	CD16-CDw26
III. Oxford	1987	CD27-CD45
IV. Vienna	1989	CD46-CDw78
V. Boston	1993	CD79-CDw109
VI. Kobe	1996	CD110-CD166
VII. Harrogate	2000	CD167-CD247
VIII. Adelaide	2004	CD248-CD339
IX. Barcelona	2009	CD340-CD364
X. Wollongong	2014	CD365-CD371

Over the past 30 y, the data generated by the 10 Human Leukocyte Differentiation Antigens (HLDA) Workshops have led to the characterization and formal designation of more than 400 molecules. Engel P et al. J Immunol. 2015;195(10):4555-63

Why should companies be interested in the results of CDMaps

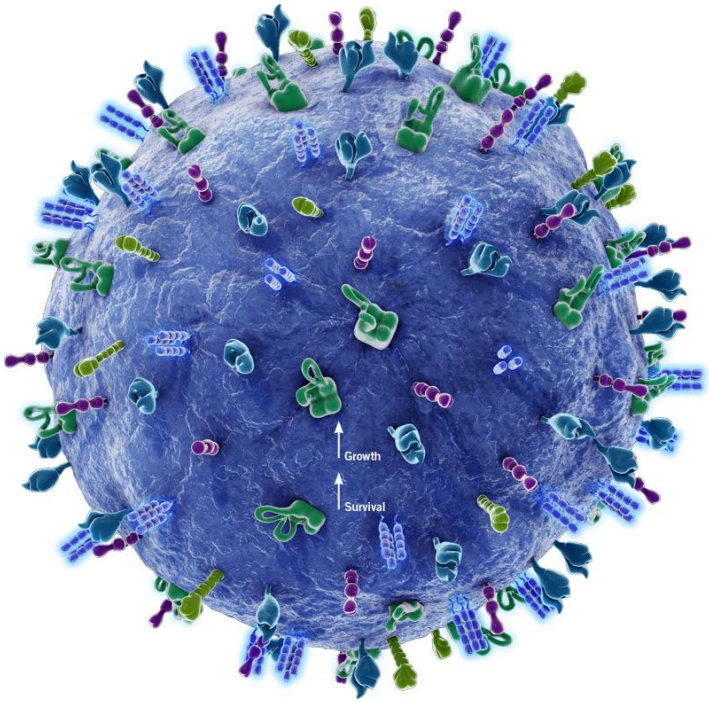
- Benchmarking reagents for expression profile (QC and catalog data)
- CD Mapping – clustering reagents to the benchmark reagents (validation by HCMD)
- Panel design – quantitative expression knowledge is crucial
- Assay conditions setup and optimization – is my staining as expected? (QC and validation)
- Analysis of the expression patterns with state of the art technology (catalog data)
- Complete information on the expression on rare subsets such as pDC (catalog data)

Aims and scope

Antigen expression Density Measurements of CD1-CD100 on Human Leukocytes

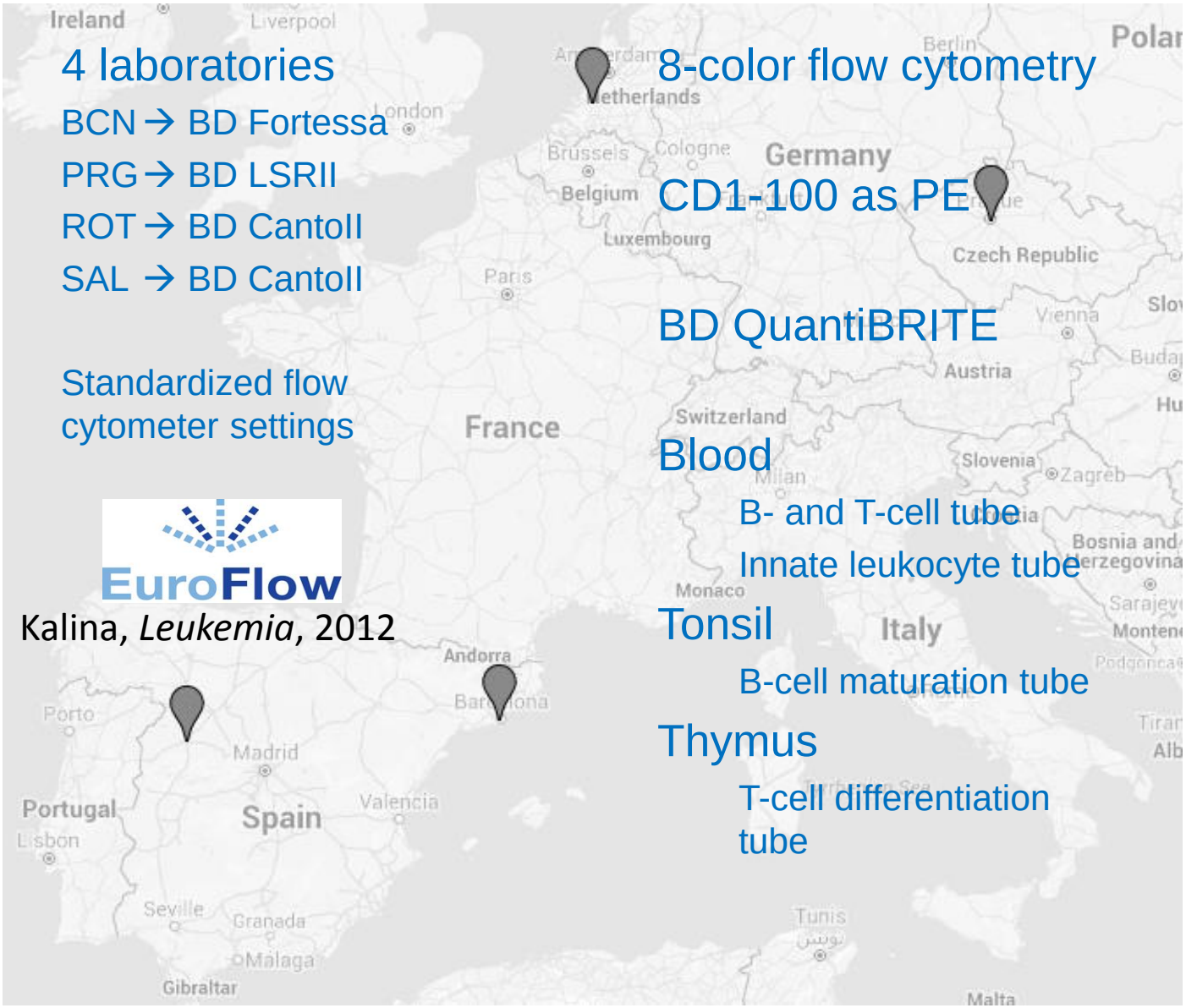
- Pilot: CD1-CD100
- Defined cells and subsets
- Quantify # molecules/cell

- Generate an interacive data base



http://www.biooncology.com/

Approach



4 laboratories

BCN → BD Fortessa

PRG → BD LSRII

ROT → BD CantoII

SAL → BD CantoII

Standardized flow cytometer settings

EuroFlow

Kalina, *Leukemia*, 2012

8-color flow cytometry

CD1-100 as PE

BD QuantiBRITE

Blood

- B- and T-cell tube
- Innate leukocyte tube

Tonsil

- B-cell maturation tube

Thymus

- T-cell differentiation tube

FlowJo

(Excel)

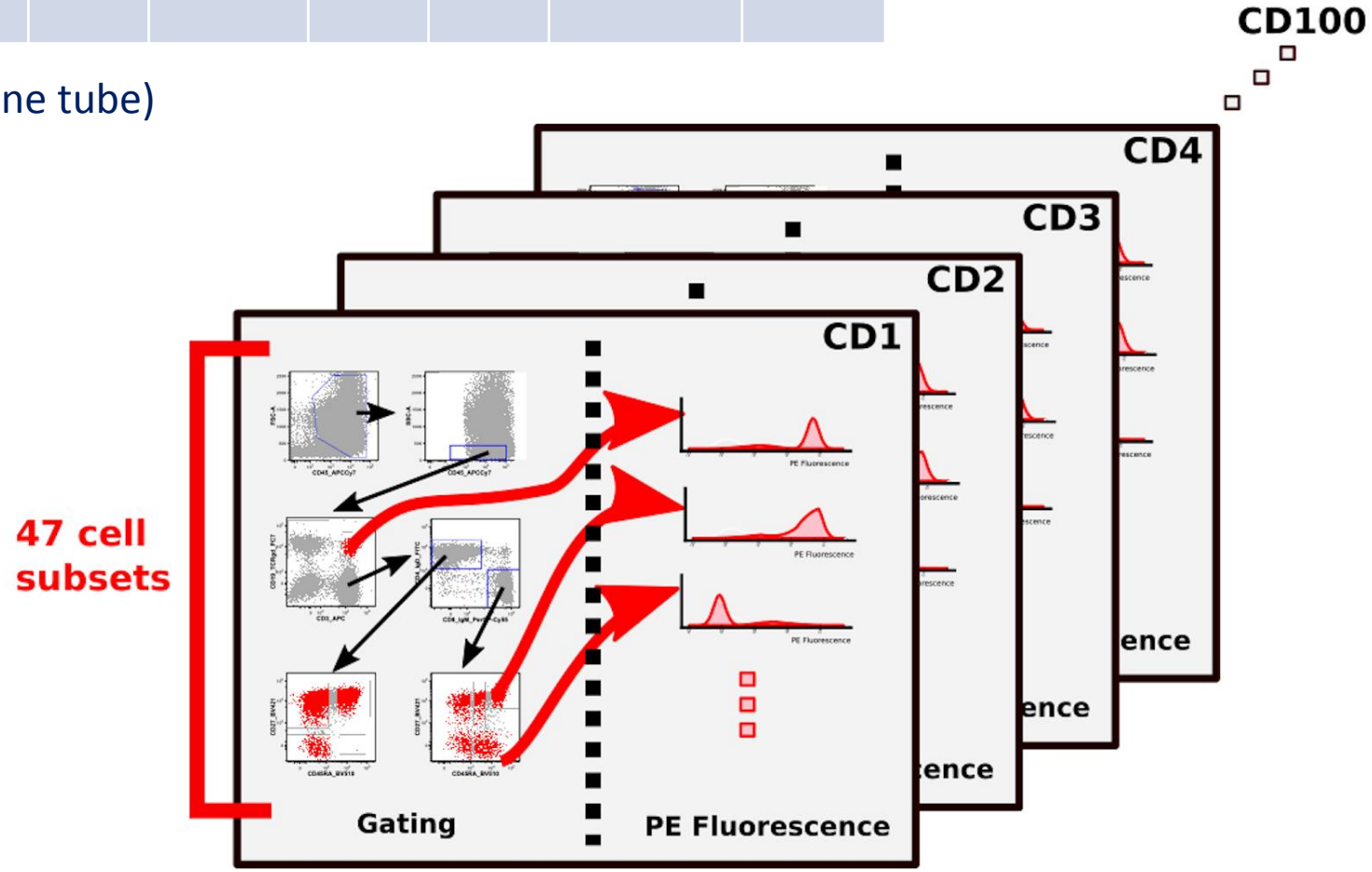
R – project

Shiny on CESNET server

Blood: B- and T-cell tube

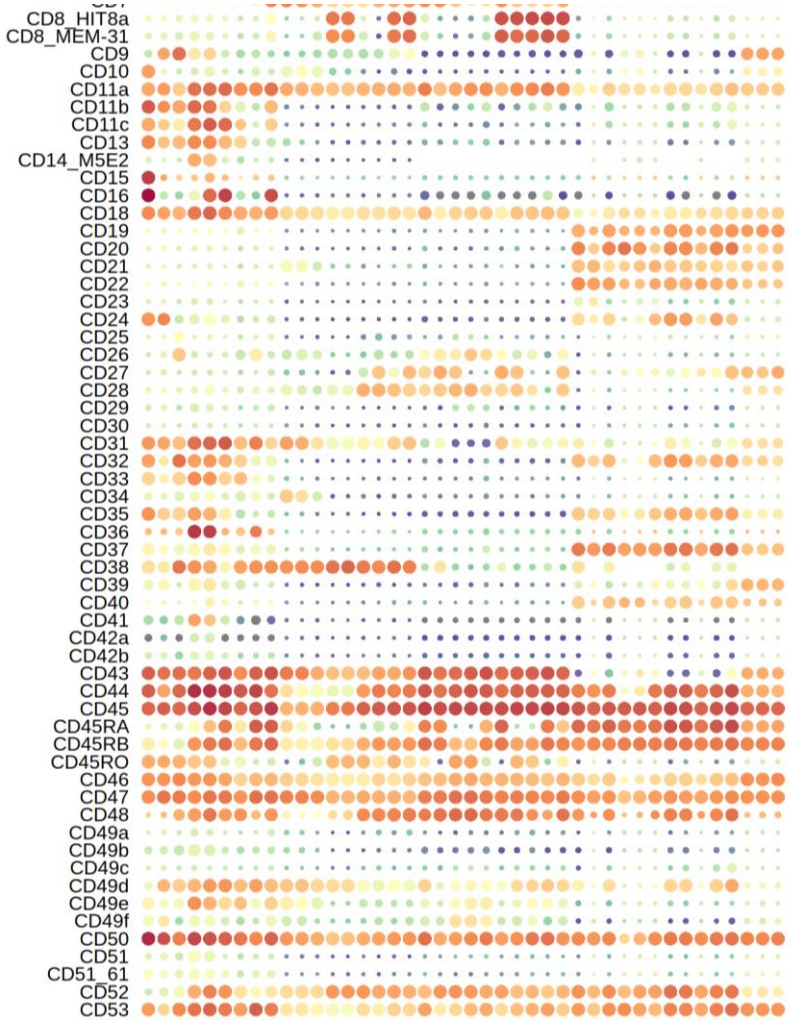
1	2	3	4	5	6	7	8
PE marker	CD45	CD3	TCRgd CD19	CD4 IgM	CD8 IgD	CD45RA	CD27

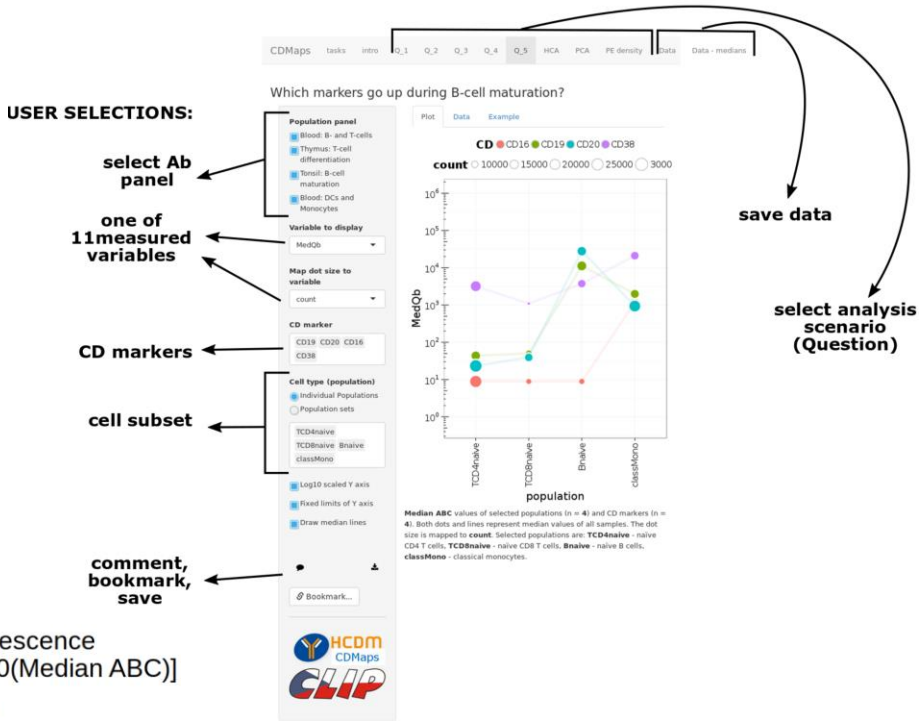
(example of one tube)

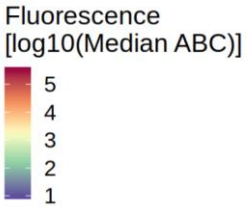


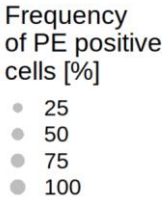
Snapshot map

Web interface to the CDMaps dataset

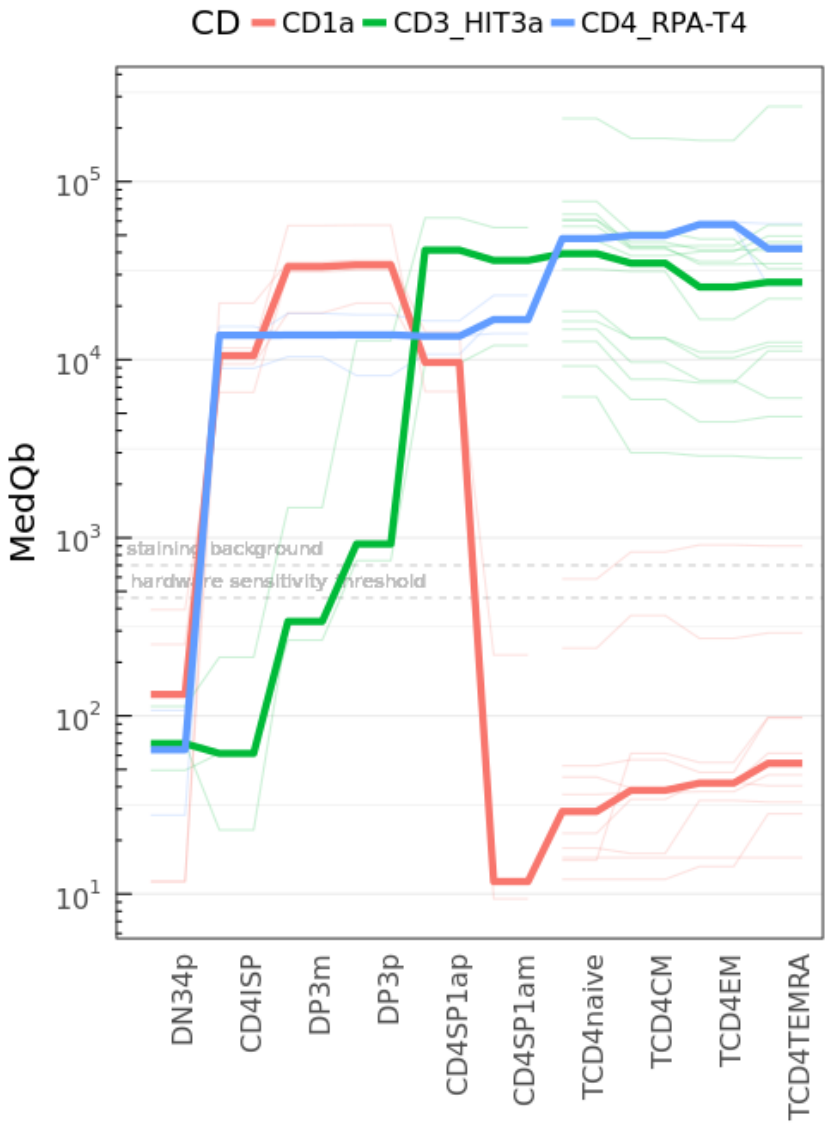


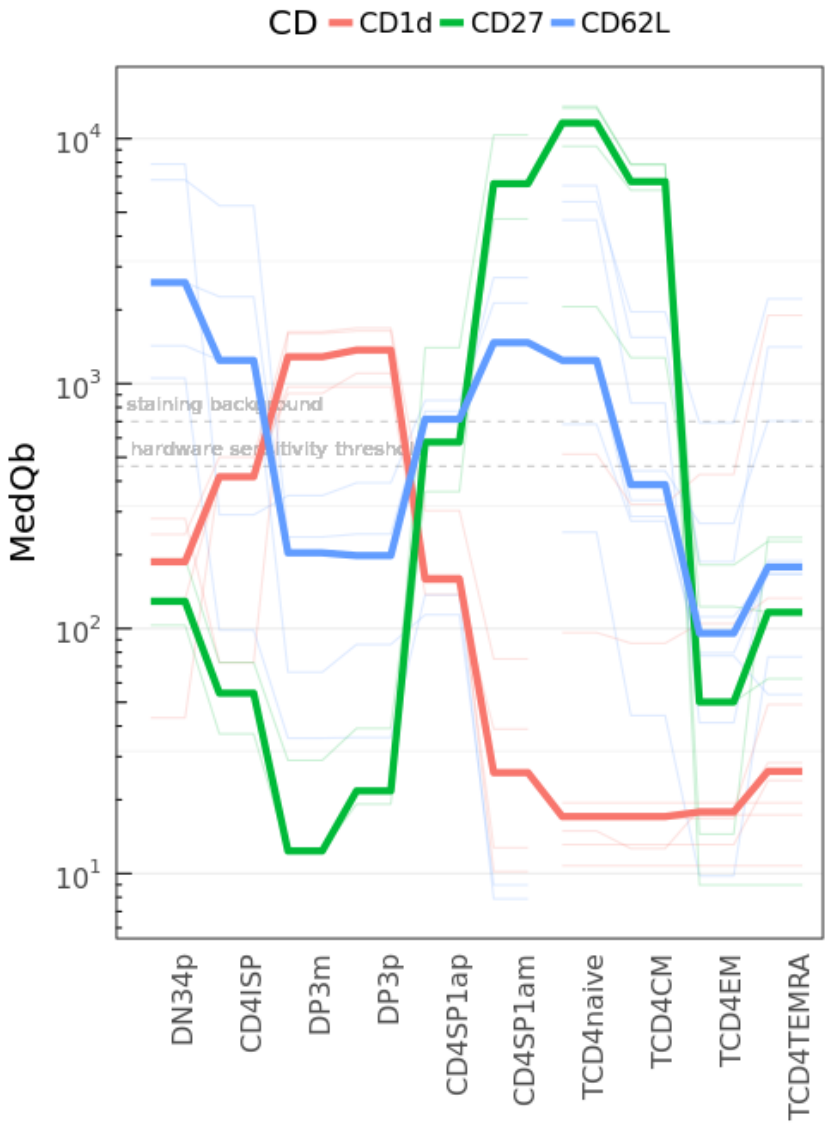






Ordererd Subsets
Thymus to blood development





What is different between subsets?

HCDM
CDMaps

Here we compare one subset

To one or multiple

Panel (population set)

2. Blood: B- and T-cells

Variable to display

MedQb

Single cell population

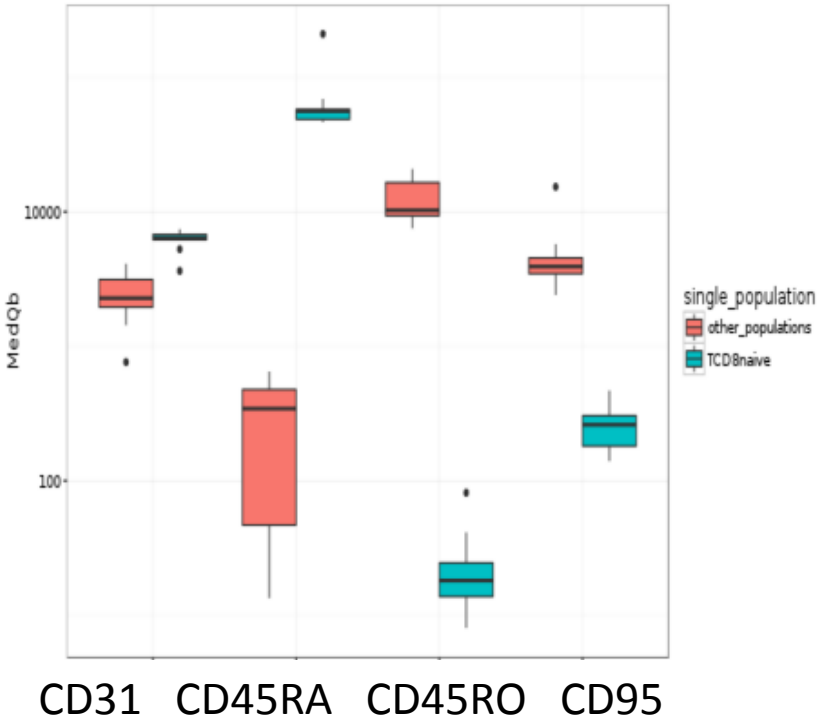
TCD8naive

Group of cell populations (do not use the one selected above)

TCD8CM

Set p-value threshold

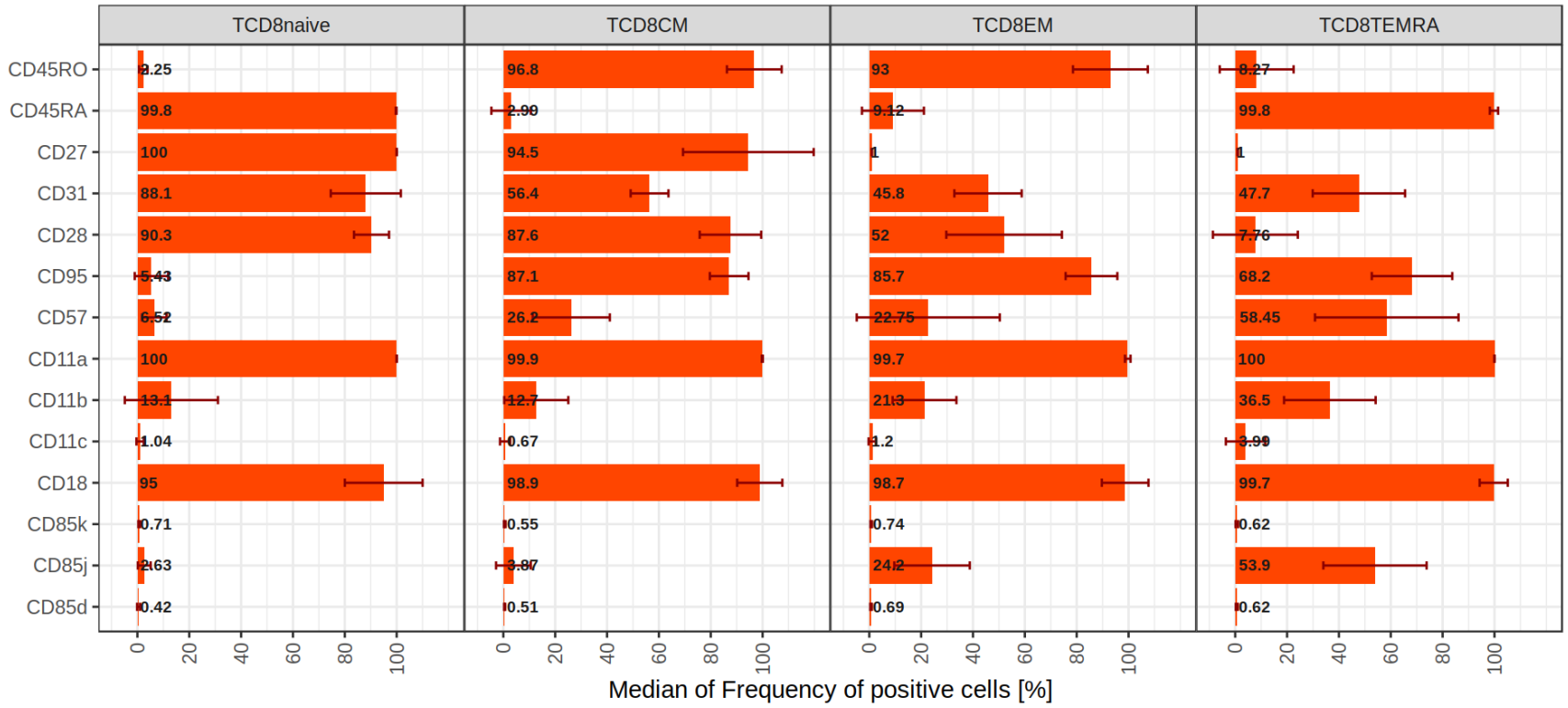
0.001



CDmaps on server

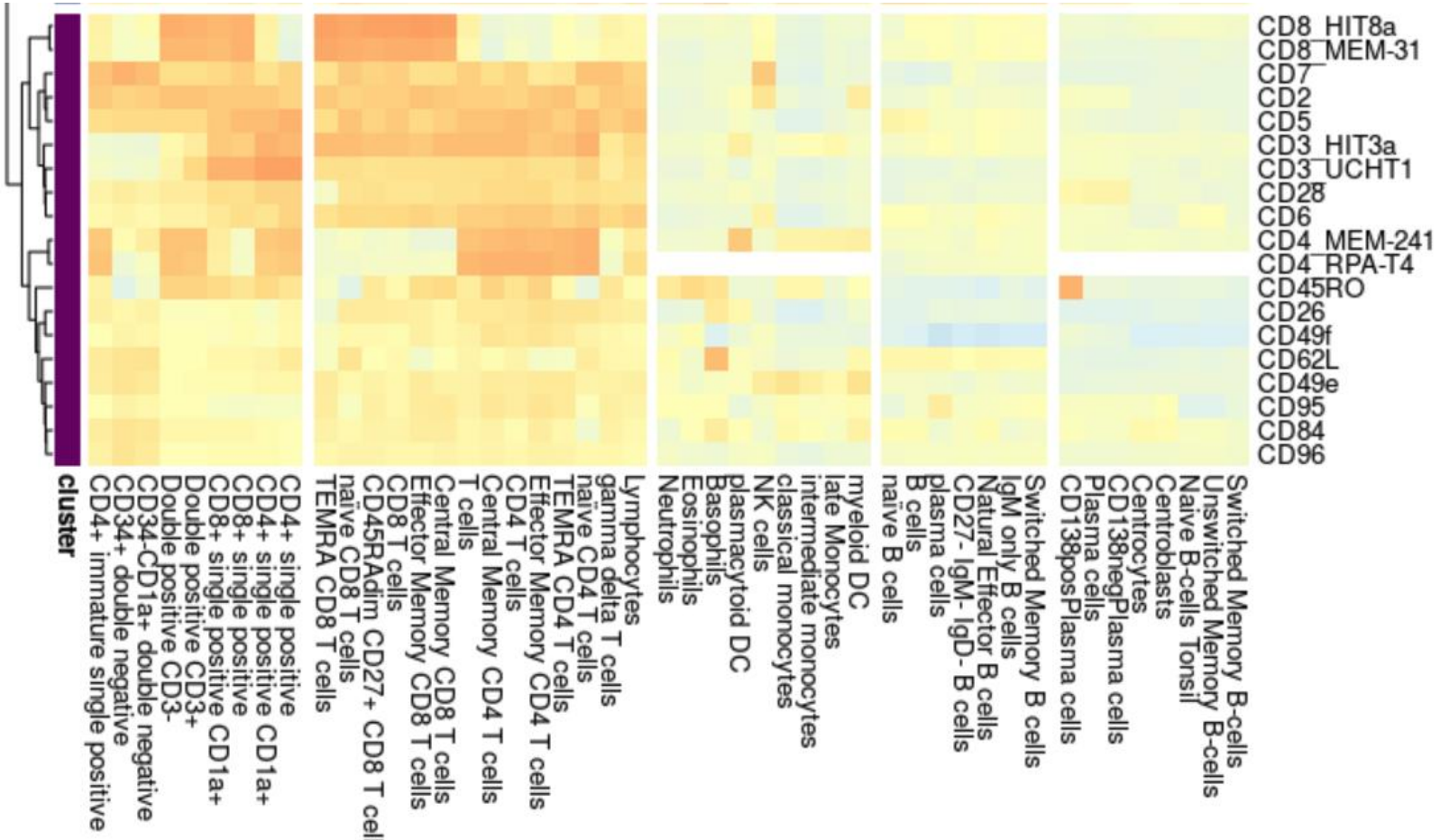
Markers per selected subsets

CD8 naive CD8 CM CD8 EM CD8 TEMRA



Clustering

Example – part of the clustering graph



Future goals (second round – 2019-2010)

- Complete the CD list.
- Add new CDs that will come from HLDA11.
- Establish clustering analysis as a validation tool

Volume of work (estimate):

- 12 donors, 550 CDs tested, 12 000 FCS files
- 5 man-month wetlab work,
- 4 man-month bioinformatics+webresource management,
- 5 man-month management, supervision, training, publication preparation

Acknowledgements

HCDM CDMaps

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BD Helping all people live healthy lives

Bob Balderas

BioLegend®
The path to legendary discovery™

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