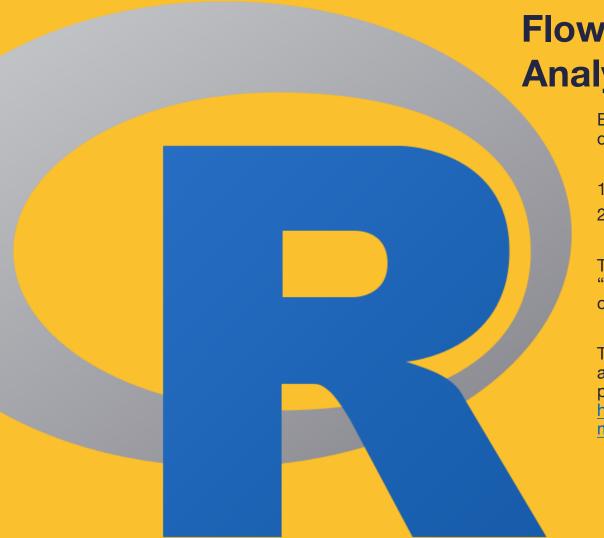


Sanger Advanced Flow Cytometry Course

Data Analysis
Part 1





Flow Cytometry Data Analysis Using R

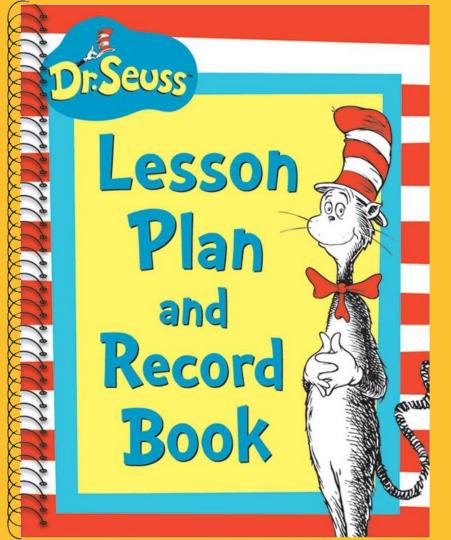
Bridging the gap between the wet and dry labs

1 hour whistle stop tour of R2 hours of applying R to flow cytometry

This is NOT a full on R course, it is a "reveal" of how to analyse flow cytometry data in R.

There are 1000's of R courses online and the University of Cambridge provides several introductory courses: https://www.training.cam.ac.uk/bioinformatics/event/2601305







- Using Rstudio
- Learn R basics

Tea break

- Quick FlowJo analysis (Chris only)
- · What is in a FCS file
- · How to load a FCS file into R
- Data transformation
- Basic statistics
- Basic figures
- Gating
- Data clean up
- Auto-gating
- Workflows
- TSNE and flowSOM
- Analyse your data

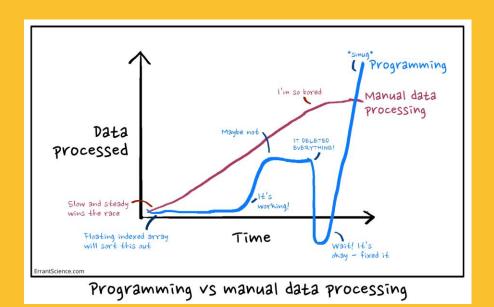






R basics





Programming languages allow you to write a set of text instructions which a computer understands and can execute

This allows you
Automate tasks
Do complex analysis

It is more flexible and customizable than using software programs







"R is a language and environment for statistical computing and graphics."

R is an integrated suite of software facilities for data manipulation, calculation and graphical display. It includes:

- an effective data handling and storage facility,
- a suite of operators for calculations on arrays, in particular matrices,
- a large, coherent, integrated collection of intermediate tools for data analysis,
- graphical facilities for data analysis and display either on-screen or on hardcopy, and
- a well-developed, simple and effective programming language which includes conditionals, loops, user-defined recursive functions and input and output facilities.
- There are 13170 packages on CRAN (Comprehensive R Archive Network).
- There are 1562 packages on Bioconductor.
- 54 specific to flow cytometry.

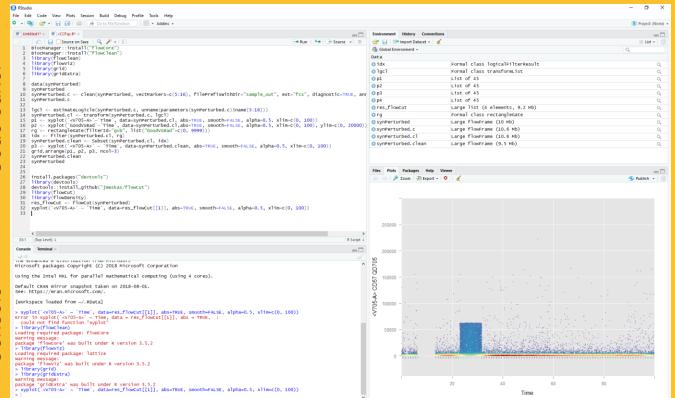


Overview



- Interface
- Entering basic commands
- Using scripts
- Accessing help
- Functions
- Plotting
- Importing data





Files, plots, ackages, and help

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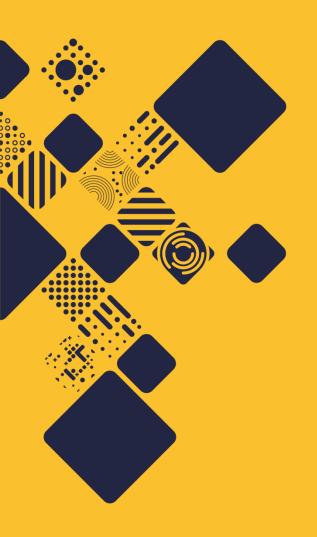
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Work through the handout

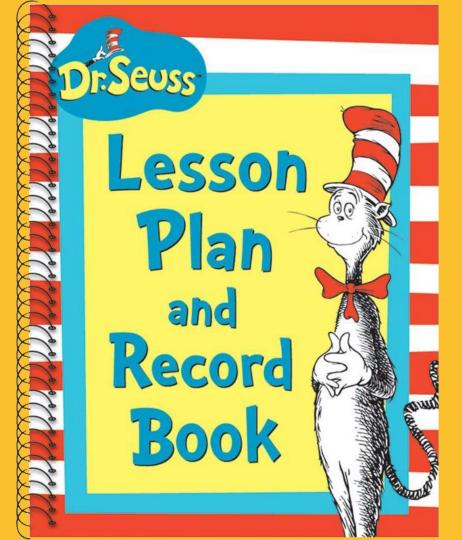




Sanger Advanced Flow Cytometry Course

Flow cytometry data analysis
Part 2





- Install R and RStudio (IDE)
- What is R
- Using Rstudio
- Learn R basics

Tea break

- Quick FlowJo analysis (Chris only)
- What is in a FCS file
- How to load a FCS file into R
- Data transformation
- Basic statistics
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- Gating
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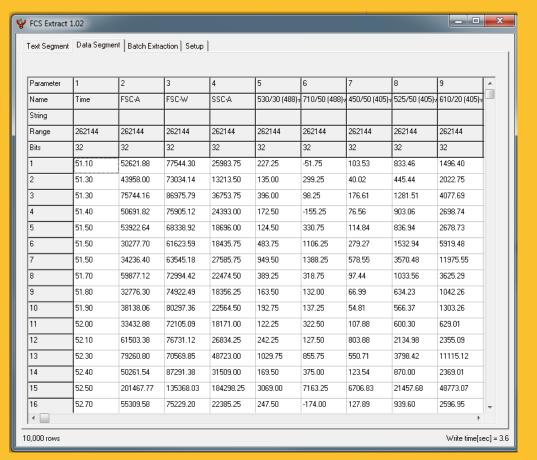


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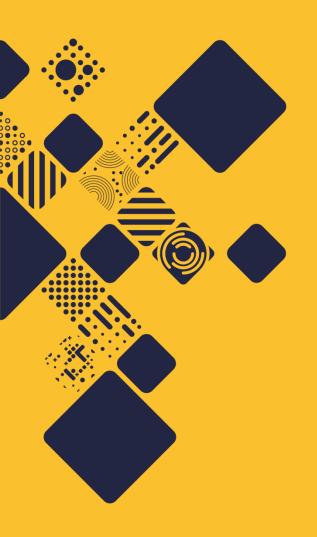






Let's load some data ©

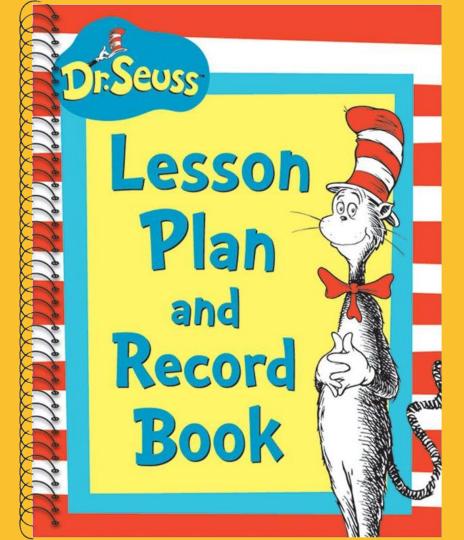




Sanger Advanced Flow Cytometry Course

Data analysis
Part 3



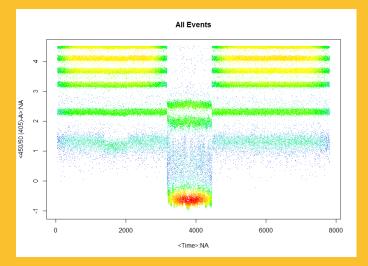


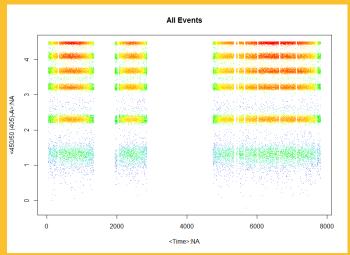
- Install R and RStudio (IDE)
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Tea break

- What is in a FCS file
- Quick FlowJo analysis (Chris only)
- How to load a FCS file into R
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- Data clean up
- Auto-gating
- Workflows
- TSNE and flowSOM
- Analyse your data









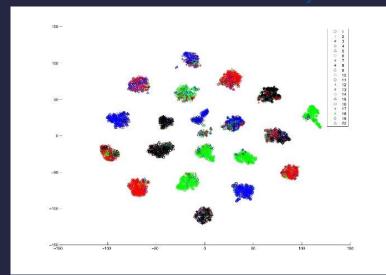
Data Clean-Up

Time vs Fluorescence

flowCut flowClean flowAl flowQC







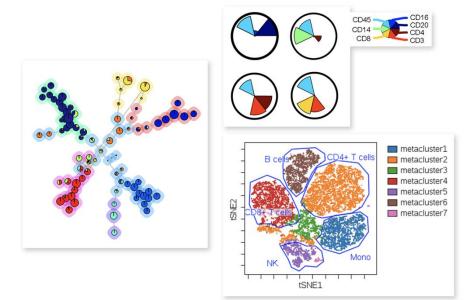


T-SNE





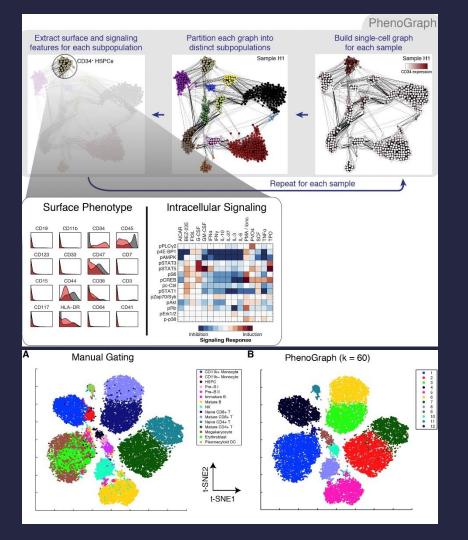






flowSOM

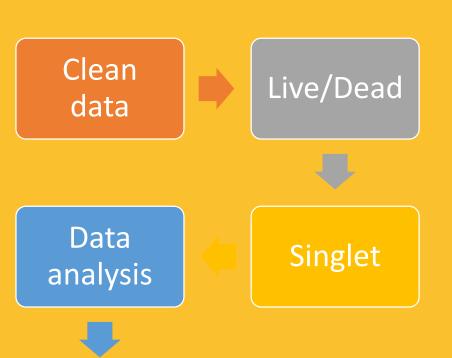






Phenograph







Workflow

Export





I am only taking easy questions

