

Supplementary material for "CYTO Lab Hacks: A platform for the exchange of innovations in cytometry"

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ABSTRACT

This supplementary material document shows a snapshot image of the existing CYTO Lab Hacks prototype website and a video showing the submission process for the future CYTO Lab Hacks website. Slides from the presentation accompanying the workshop at CYTO 2019 are also included.

Fig. 1. Snapshot of the CYTO Lab Hacks website <http://bit.ly/CytoLabHacks>. The snapshot shows the navigation panel with four entries on the left. The entries lead to website sub-sections: (1) "About" the CYTO Lab Hacks project, (2) "Publications" related to the project (3) scheduled "Events", and (4) "CYTO Lab Hacks Submission" button to post a new innovation. The main window to the right shows three innovations currently posted on the website. The image is current as of September 2019.

**CYTO
LAB
HACKS**
*CYTO Lab
Hacks*
*A platform for the exchange of
Innovations in cytometry*

About

Publications

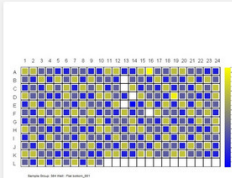
Events

CYTO Lab Hacks Submission

Enter your search query

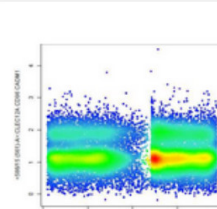
Search

**CYTO
LAB
HACKS**



Latin Squares for the BD Influx

This program applies predefined sort templates to your BD Influx workspace. Applying a complex sort layout to a cell sorter...



Automatic Monitor of Sample Acquisition Quality

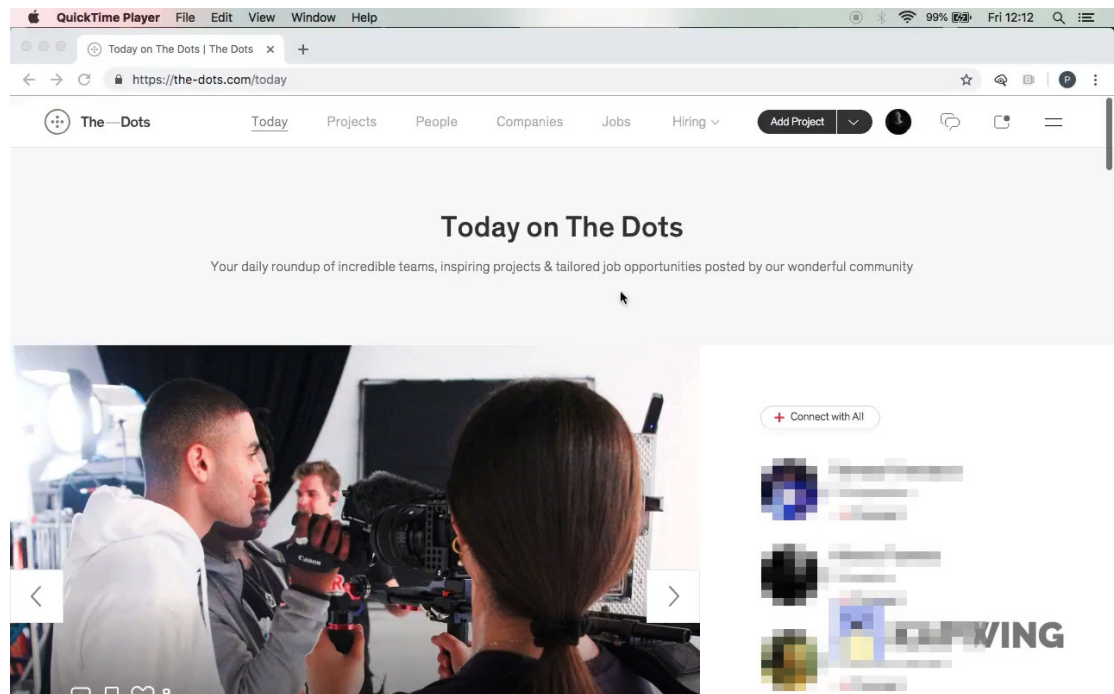
Autonomously monitor user sample quality for flow cytometers.



Sheath Filter Holder

This sheath filter holder help keeping the Sheath Filter vertical to ease viewing for bubbles and the tubing organized.

Video 1. Example of a project submission process for the future CYTO Lab Hacks website. A screen capture video was created from an existing website used in the creative industry. It shows the workflow associated with a project submission that we aim to recreate in the future CYTO Lab Hacks website. The video was prepared for the workshop participants to quickly imagine our idea of the future submission process and be able to provide accurate feedback and suggestions for improvement.



Presentation 1. The slides starting on the next page guided the workshop and supported the oral presentations with a visual reference.

CYTO Lab Hacks: A Platform for the Exchange of Innovations in Cytometry

Cláudia Bispo (UCSF), Bunny Coteleur (Biogen), Christopher Hall (Sanger), Jakub Nedbal (KCL)



Structure of the Workshop

- Introduction
- Present a few innovations
- Break out sessions (round table discussion)
- Summary of the break out sessions
- ~~Show and~~ tell
 - Realise that your “little” project can help others and others can help you to improve it.

Motivation

Problem:

We have common issues.

Disseminate solutions to avoid wasted effort.

Opportunity:

Create centralized directory for innovations.

Incentivize sharing and exchange of innovations.



Strategy

- Group of volunteers (since CYTO 2018).
- Organization, planning, website development.
- We are seeking your help to push us forward.
 - Workshop.
 - Submitting these innovations.

CYTO Lab Hacks

- Budding platform for the exchange of cytometry innovations.
- Community driven activity.
- Overseen by the CYTO Innovations Committee.

Directory for non-commercial innovations related to cytometry

<http://bit.ly/CytoLabHacks>



CYTO Lab Hacks Prototype Website



About

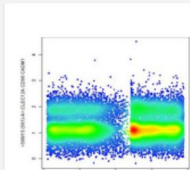
Publications

Events

CYTO Lab Hacks
Submission

Search

<https://cytolab.000webhostapp.com>



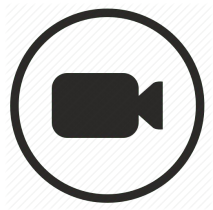
Automatic Monitor of Sample Acquisition Quality

Autonomously monitor user
sample quality for flow cytometers.



Sheath Filter Holder

This sheath filter holder help
keeping the Sheath Filter vertical
to ease viewing for bubbles and
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FACSARIA Nozzle Repair Video

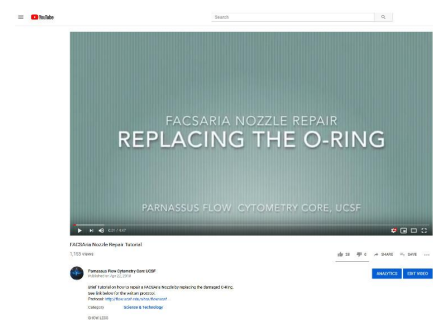
Why we did this?

Need for replacement nozzles s Core grew from 2 to 8 FACSARIA
purchasing new Nozzle was becoming *prohibitively expensive*

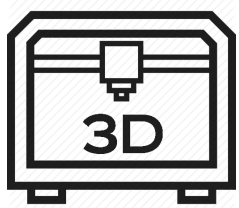
Repaired O-ring lasts for 3 -6 months only, although
replacing the O-ring has saved the Core over thousands of \$\$ / yr

Posted on: YouTube

Multimedia files available: Detailed protocol with instructions



<https://flow.ucsf.edu/>



FACS Aria Plate Remover Tool

Why we did this?

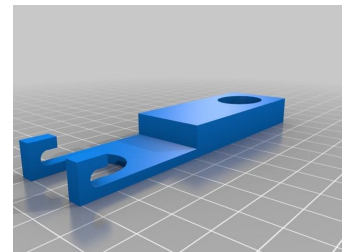
Tool kept being misplaced, and users were starting to damage the plates

We now have 1 tool per instrument

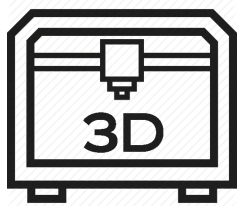
Printed and color coded with instrument's "color", easy ID'ed

Posted on: Thingiverse

Multimedia files available: STL file with instructions



<https://flow.ucsf.edu/>



Sheath Filter Holder

Why we did this?

Sheath filter was loose and most times horizontally placed in custom fluidics cart

Vertical placement maintains fluidics more stable, keeps tubing organized and more intuitive for user's inspection for bubbles

Posted on: Thingiverse & <https://flow.ucsf.com>

Multimedia files available: STL file with instructions



<https://flow.ucsf.edu/>

```
01010111 01100101 01101100 01101100
01100011 01101111 01101101 01100101
00100000 01010011 01100001 01101110
01100111 01100101 01110010 00100000
01001001 01101110 01110011 01110100
01101001 01110101 01110100 01100101
00100000 01000011 01111001 01110100
01101111 01101101 01110100 01110010
01111001 00100000 01000011 01101111
01110010 01100101 00100000 01000110
01000001 01100011 01101001 01101100
01101001 01110100 01111001
```

User “Acquisition Quality” Program

What is it?

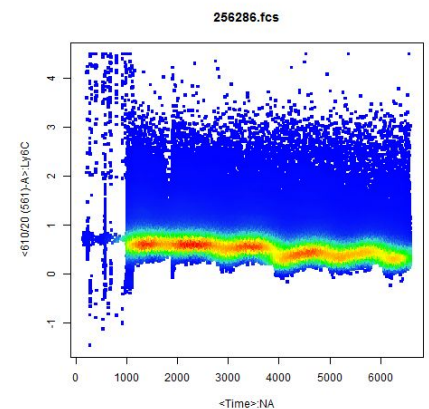
Autonomously monitor user sample quality for flow cytometers.

Why we did this?

We wanted to find identify problematic users to prevent their poor sample preparation affecting other later users.

Posted on: <https://github.com/SangerCytometry/SampleQualityMonitor>

Multimedia files available: YouTube (soon), Poster B106

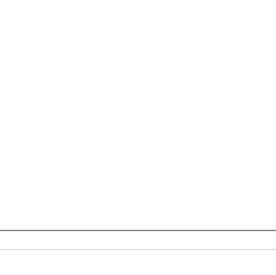


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01101001 01110101 01110100 01100101
00100000 01000011 01111001 01110100
01101111 01101101 01110100 01110010
01111001 00100000 01000011 01101111
01110010 01100101 00100000 01000110
01000001 01100011 01101001 01101100
01101001 01110100 01111001

```

Latin Square Sort Patterns



What is it?

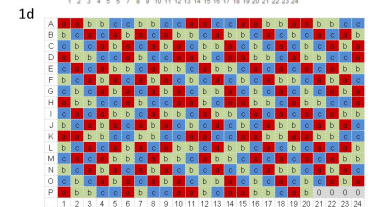
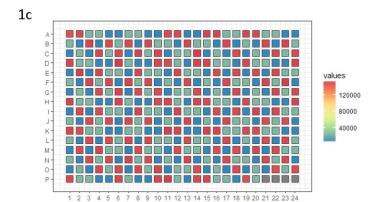
Use sorted cell position to control batch effect.

Why we did this?

To mitigate the effect of plate position in downstream processes, such as uneven plate heating on thermocyclers and robotic pipetting accuracy

Posted on: https://github.com/SangerCytometry/Influx_auto_sort_template

Multimedia files available: YouTube



Question 1

What makes an innovation generate interest and enthusiasm in the cytometry community?

Practical Innovations

Biological Innovations

Personal Innovation

Help us define the criteria for worthy innovations, both major or incremental.



Question 2

How to organize the CYTO Lab Hacks group to work efficiently towards its goals?

Different roles required.

How to organize and keep a globally dispersed group of volunteers engaged.

How to ensure consistent regular progress.

Help us come up with a committee structure and roles for volunteers.



Question 3

How should CYTO Lab Hacks website look like? What should each submission include?

Minimum requirements for a submission.

Easy of navigation.

Sweet spot between its usefulness to the community and effort required from the innovator.

Help us define the criteria that will guide the development of the website.



Break out session

Introduce each other.

Take notes - designate a person.

Discuss the questions amongst yourself.

Record notable comments.

Aim towards conclusive outputs.



We need your hacks

<http://bit.ly/CytoLabHacks>

