Abstract Template

Title: Free Software and Hardware Design: Tools for laboratory automation and science communication

STELMASTCHUK LBF[1], THIEMANN OH[1]

[1]Physics Institute of São Carlos, Brasil

Keywords: Automation, Recombinant Protein Expression, Free Software/Hardware Design, 3D Printing

I. Abstract Body (up to 250 words)

The production of recombinant proteins for therapeutics, veterinary and agricultural purposes is a very successful technology. The process relies on achieving the proper cell growth conditions and induction of protein expression, which requires a careful screening experiment before scaling up the production. Automation in a miniaturized and high throughput format for protein production allows researchers to conduct higher complexity experiments as it handles a number of different samples and conditions simultaneously. For structural biology studies, obtaining well expressing and correctly folded protein from gene constructs is still a time consuming process. Although various methods are available, the equipment required for parallel expression experiments is expensive and restricted to facilities operated by trained personnel. This study reports the construction of an inexpensive customizable device for high throughput protein expression making use of 3D printing techniques and free software/hardware design (1,2).

II. Image:

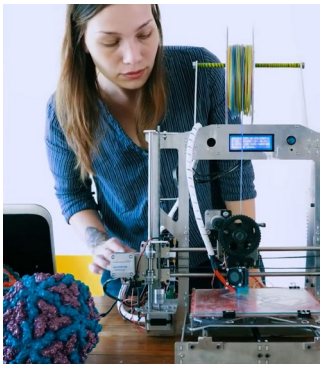


Figure 1: 3D printing PDB structures. Image produced by Sesc for FestA!, an event aimed at giving visibility to Sesc, a Brazilian non-profit private institution.



Figure 2: 3D printed support for 24 well plate.

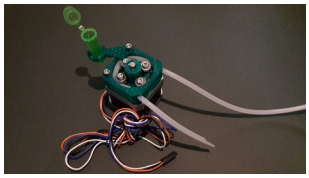


Figure 3: Minimalistic peristaltic pump assemble

III. Reference:

1 BADEN, T. et al. Open labware: 3-D printing your own lab equipment. PLoS Biology, v. 13, n. 3

2. PEARCE, J. M. Open-source lab: how to build your own hardware and reduce research costs. Amsterdan: Elsevier, 2014.

IV. Biography:

Laure Stelmastchuk has bachelor degree in pharmacy, has experience in gene characterization, recombinant protein production, x-ray chrystallography and EPR. Currently is developing a high throughput bioreactor making use of Free Software/Hardware Design and 3D printing techniques as PhD project. In her role as educator, combines science communication, arts and technologies such as additive manufacturing.

V. Presenting author details



Full Name: Laureana Stelmastchuk Benassi Fontolan
Contact number: +5511941777374
Twitter account: -
Linked In account:https://www.linkedin.com/in/laureana-stelmastchuk-486776a/
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