waag society

institute for art, science and technology

BioHack Academy
General Introduction

Picture by Bas Uterwijk

The age of biology

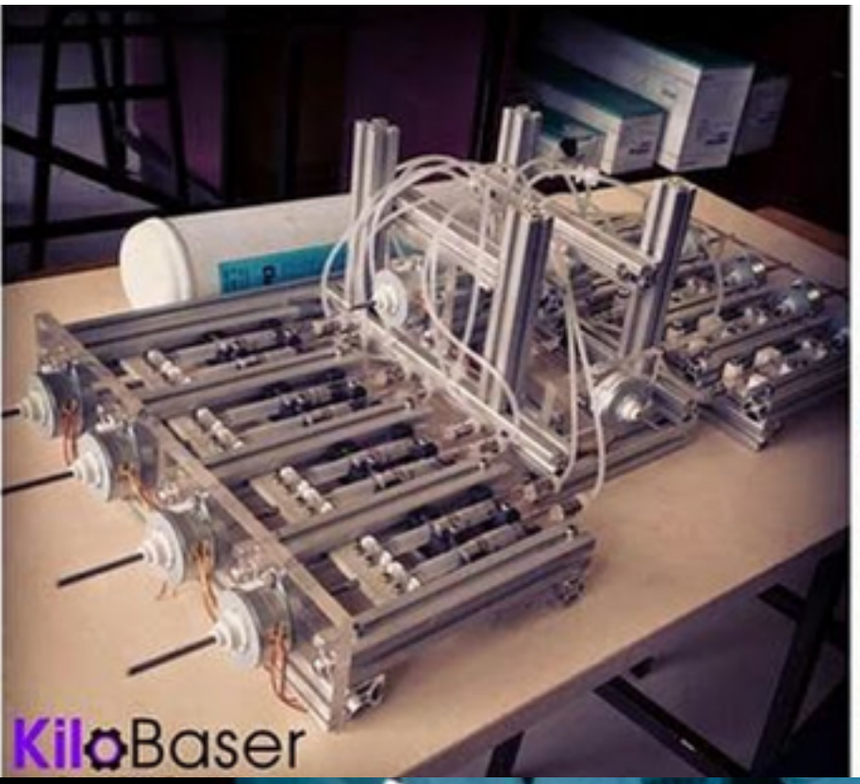
Thomas Schoch - CC-BY-SA 2.5

Public Domain

ParentingPatch - CC-BY-SA 3.0

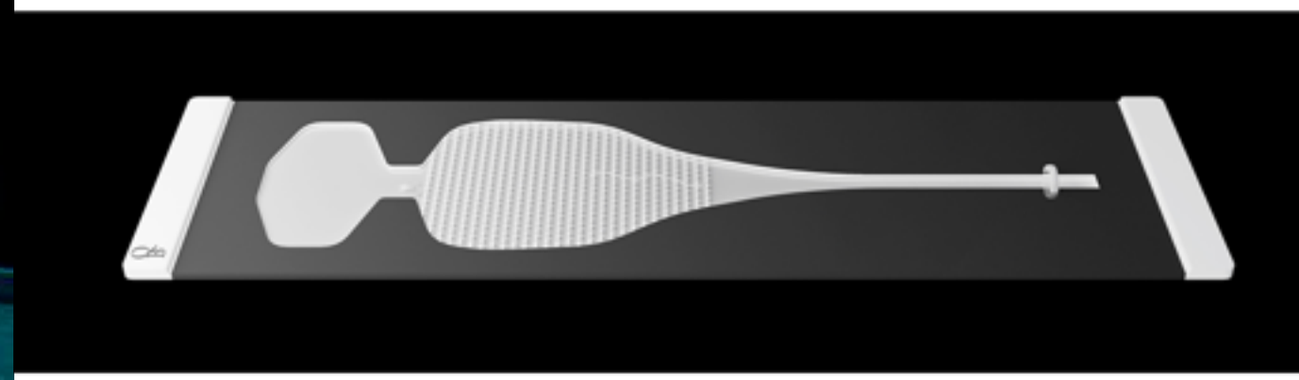
n-o-n-a-m-e CC-BY-SA-NC 3.0

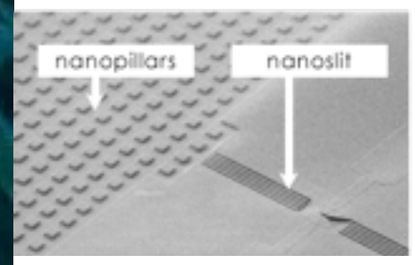
Bio engineering

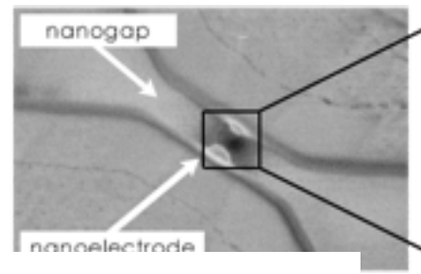


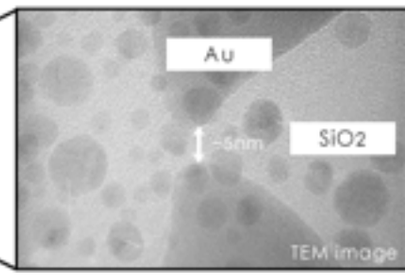
Organovo

Tokyo University





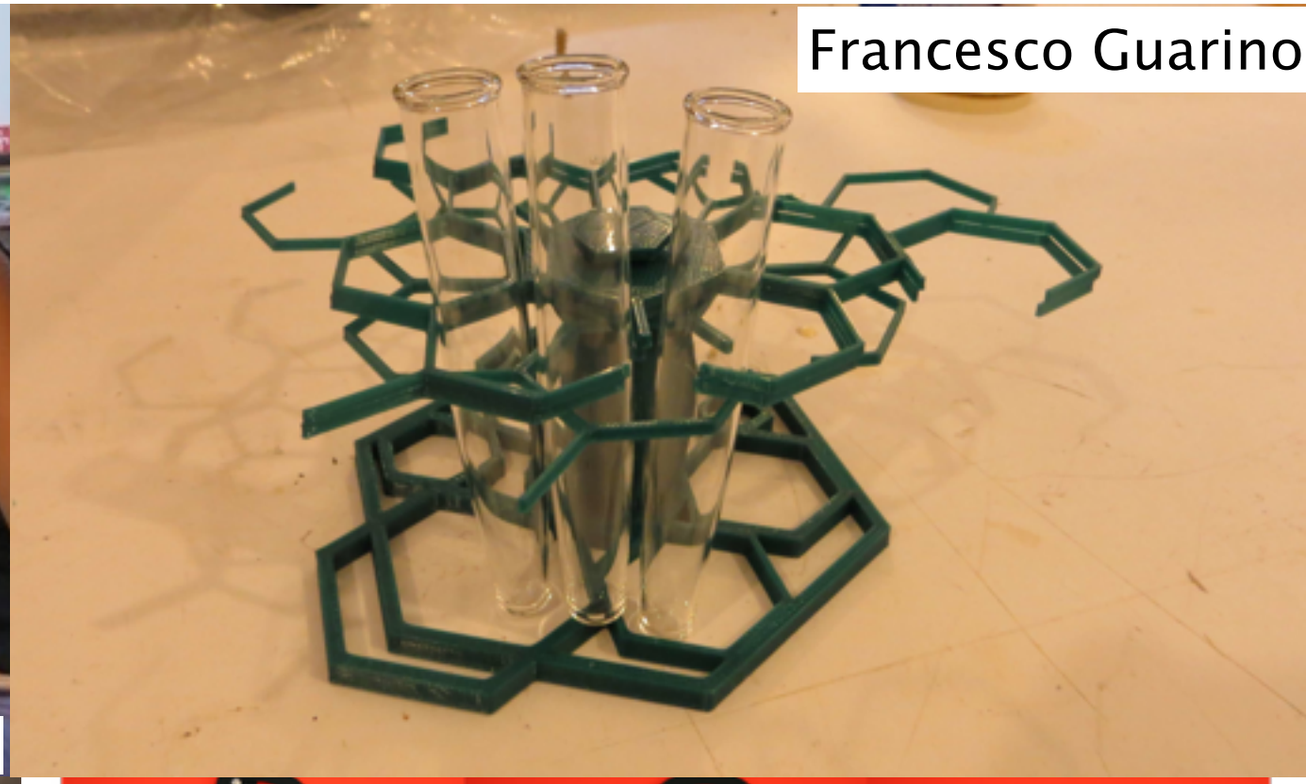




Quantum Biosystems

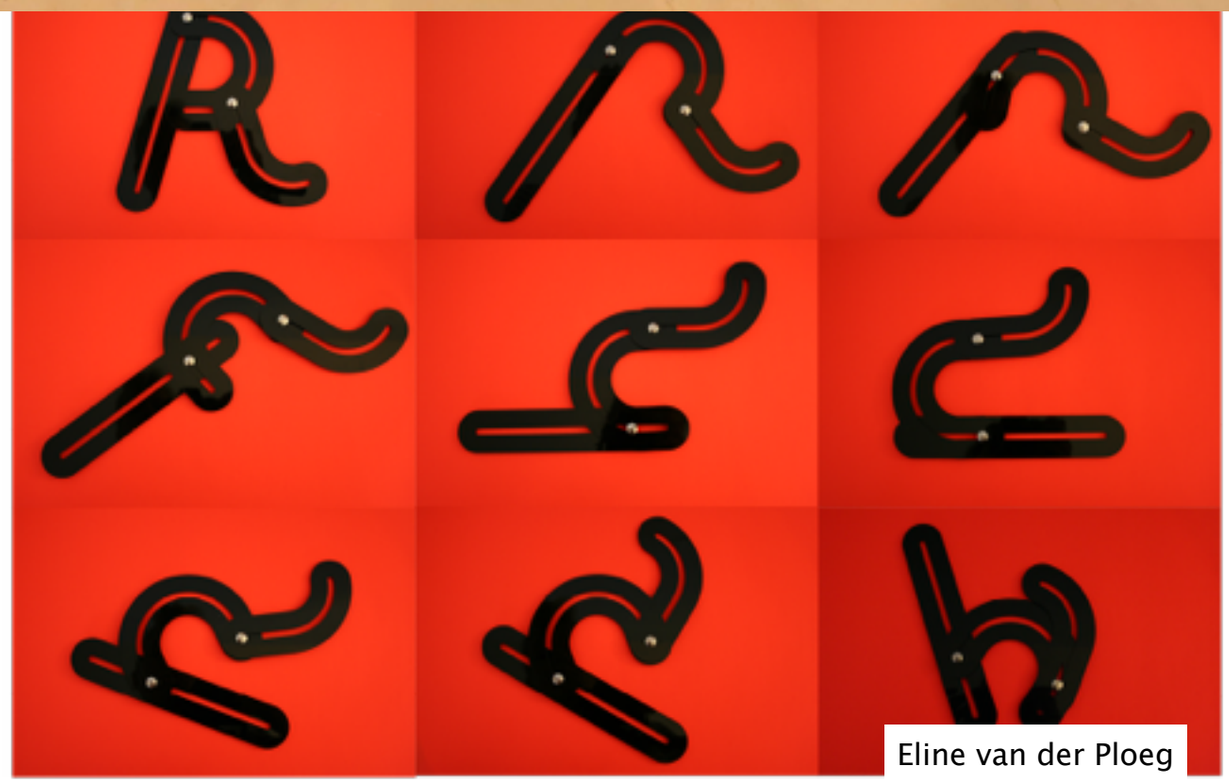
BioHack Academy

Garagem Fablab



Francesco Guarino

Tony Garcia



Eline van der Ploeg

Bio materials

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Future Everything - CC-BY-SA 3.0

Build your lab

Use it

Share it

The goal of this Academy

Skills you will learn:

- Microbiology
- Molecular biology
- Biotechnological reactor design
- Biorefinery
- Spectral analytics
- Bio informatics
- Analog electronics
- AVR microprocessor programming
- 3D drawing and parametric design
- 2D computer aided design
- 3D printing
- (Micro)fluid dynamics
- Thermodynamics
- Mechanics
- Open design licensing
- Chemical and biological safety

Tools you will learn to use:

- All the tools you will build yourself
- Lasercutter
- 3D printer
- Arduino processing language
- OpenSCAD 3D modeling
- Sketchup 3D modeling
- Fritzing electronic circuit design
- Inkscape 2D design
- Markdown language
- Github

The Team

Pieter

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Lucas

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Michele

Anthony

Schedule: Classes

1	Introduction	Sep 15
2	Microbiology	Sep 22
3	Biomaterials	Sep 29
4	Optics	Oct 6
5	Genetics	Oct 13
6	YOUR PROJECTS	Oct 20
7	Seperation techniques	Oct 27
8	Guest Speaker	Nov 3
9	Bioinformatics	Nov 10
10	YOUR PROJECTS	Nov 17

Schedule: Devices

1	Sterile Hood	Sep 15
2	Magnetic Stirrer	Sep 22
3	Incubator	Sep 29
4	Microscopes	Oct 6
5	Thermocycler & Gelbox	Oct 13
6	YOUR PROJECTS	Oct 20
7	Centrifuge	Oct 27
8	Pumps	Nov 3
9	Spectrometer	Nov 10
10	YOUR PROJECTS	Nov 17

Schedule: Practicals

1	Digital Fabrication Device construction	Sep 21 Sep 22
2	Cultivating microbes	Sep 28
3	Isolating microbes	Oct 6
4	Microscopy	Oct 12
5	DNA fingerprting	Oct 20
6	YOUR PROJECTS	Oct 20
7	P2P reviewing	Nov 2
8	Growing certificates	Nov 9
9	PyMol Spectrometry	Nov 16
10	Final presentation	Nov 17

“Open Labs” in between

Schedule: Microbes

1	Isolation / Cultivation	Sep 15
2	Isolation / Cultivation	Sep 22
3	Isolation / Cultivation	Sep 29
4	Liquid culture	Oct 6
5	Liquid culture	Oct 13
6	Down stream processing	Oct 20
7	Down stream processing	Oct 27
8	Reactor setup	Nov 3
9	Reactor setup	Nov 10
10	Graduation	Nov 17

Project Meetings

Project meetings to discuss:

1. Develop your own project
2. Set up your own documentation site on Github;
3. Publish videos;
4. Design a personal laboratory tool;

Syllabus

- http://biohackacademy.github.io

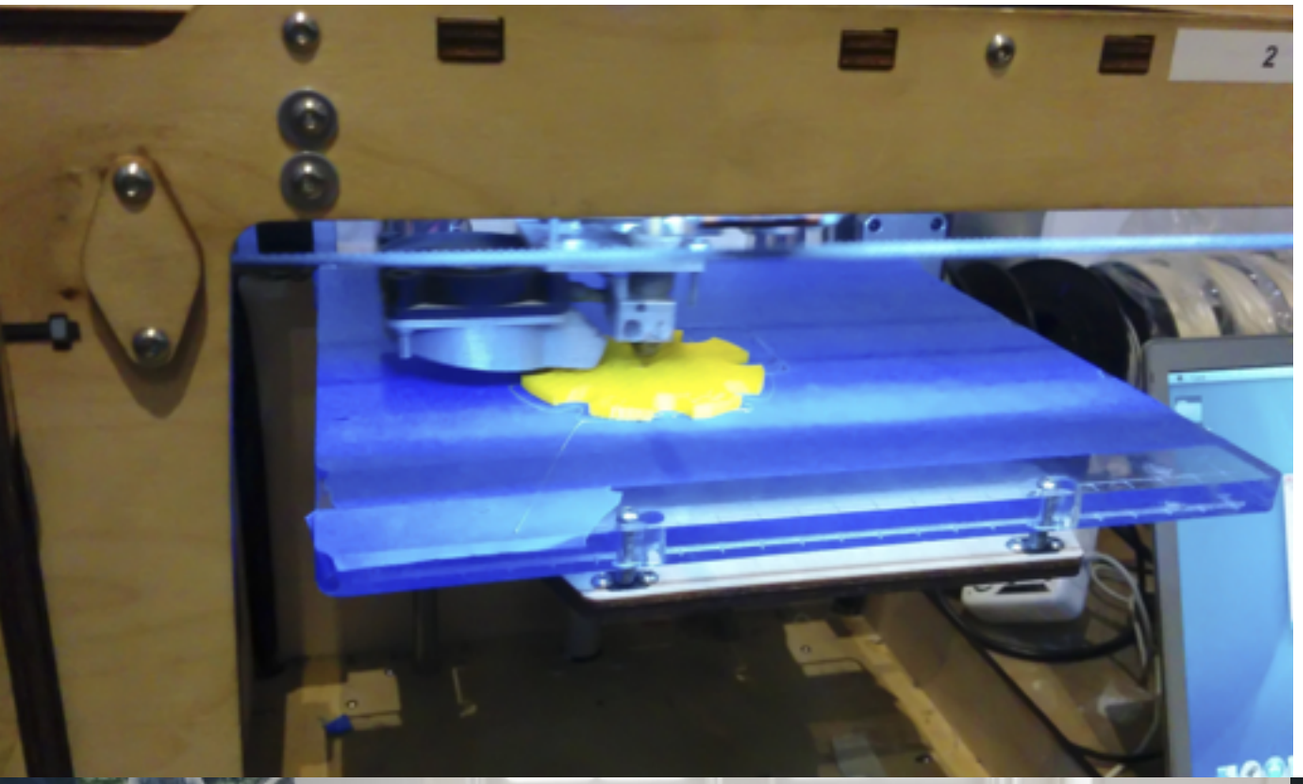
  - Lecture Slides
  - Lecture Videos

  - Device blueprints, circuits and code

  - Practical protocols

  - Preparation

Fun Stuff



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