



waag society

institute for art, science and technology

Picture by Margot

BioHack Academy ThermoCycler Design



Why we need a thermocycler

- Multiply DNA
 - Analyse it
 - Clone it



Industry Standard



Paul Hartzog - CC-BY-SA 2.0



Hacks

OpenPCR

Picture by MadLab



OpenerPCR

Picture by DIYBio Groningen



Wild Open PCR
Picture by GaudiLab

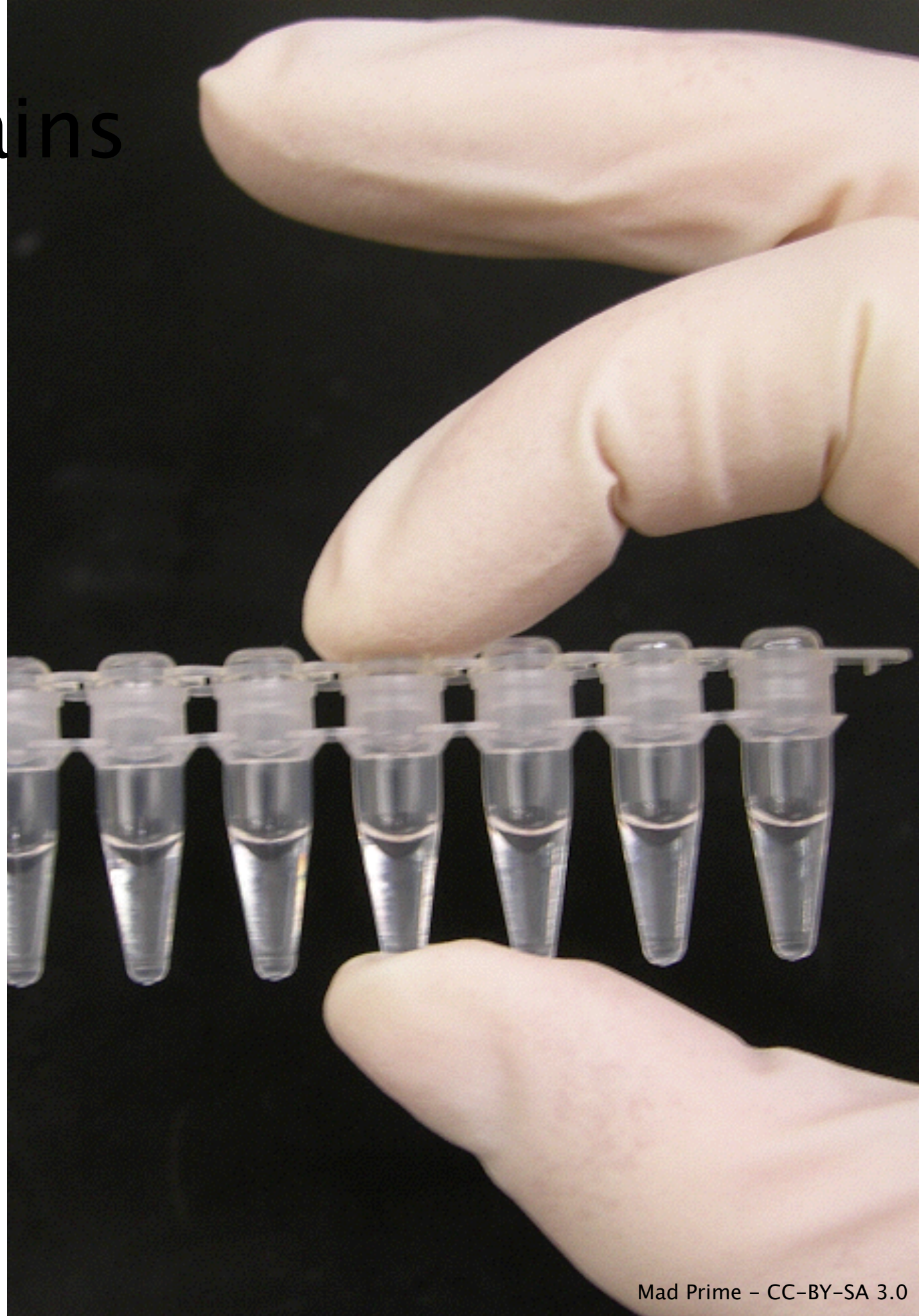


Picture by DailyMail



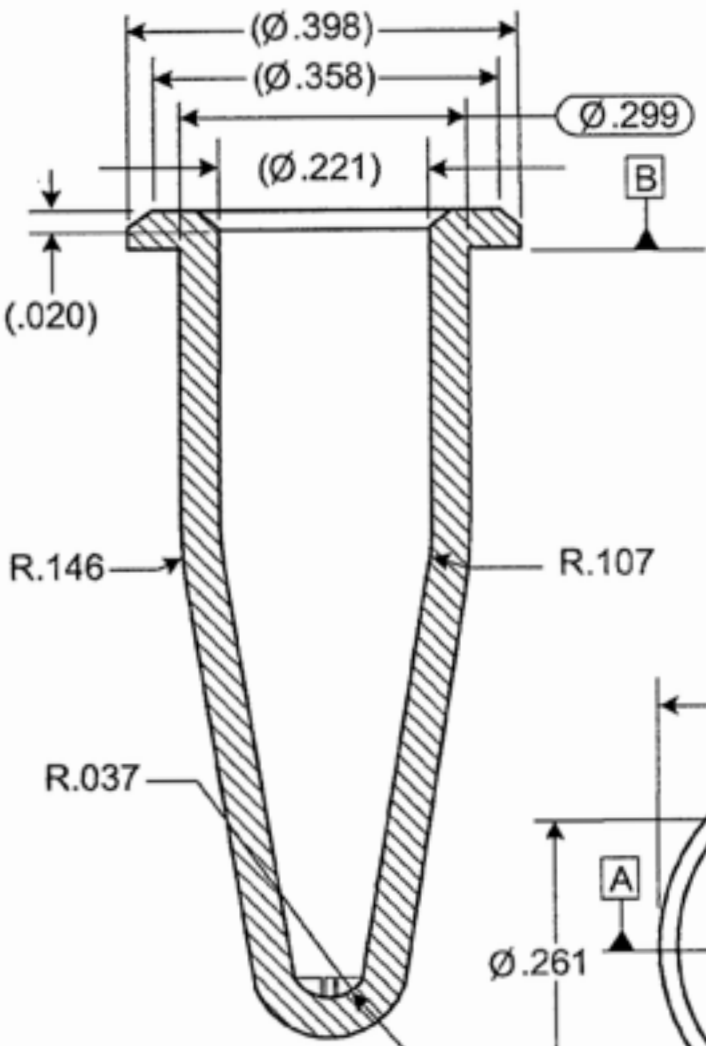
Design Constraints

- PCR tubes





Patent US8216530



SECTION A-A
SCALE 4:1

FIG. 4A

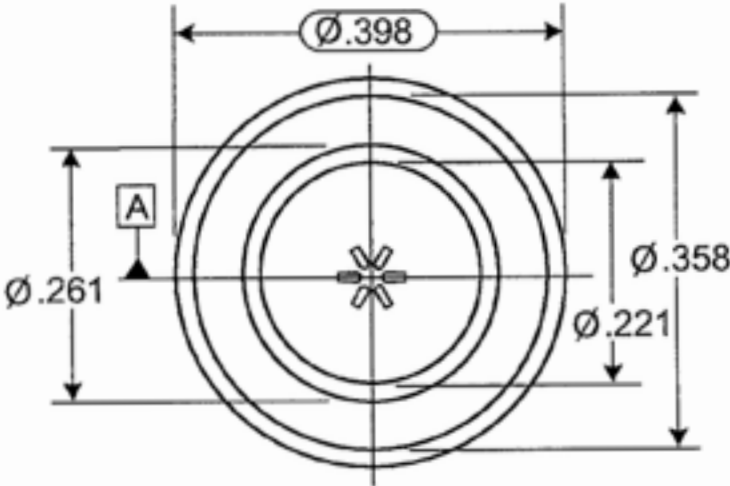


FIG. 4B

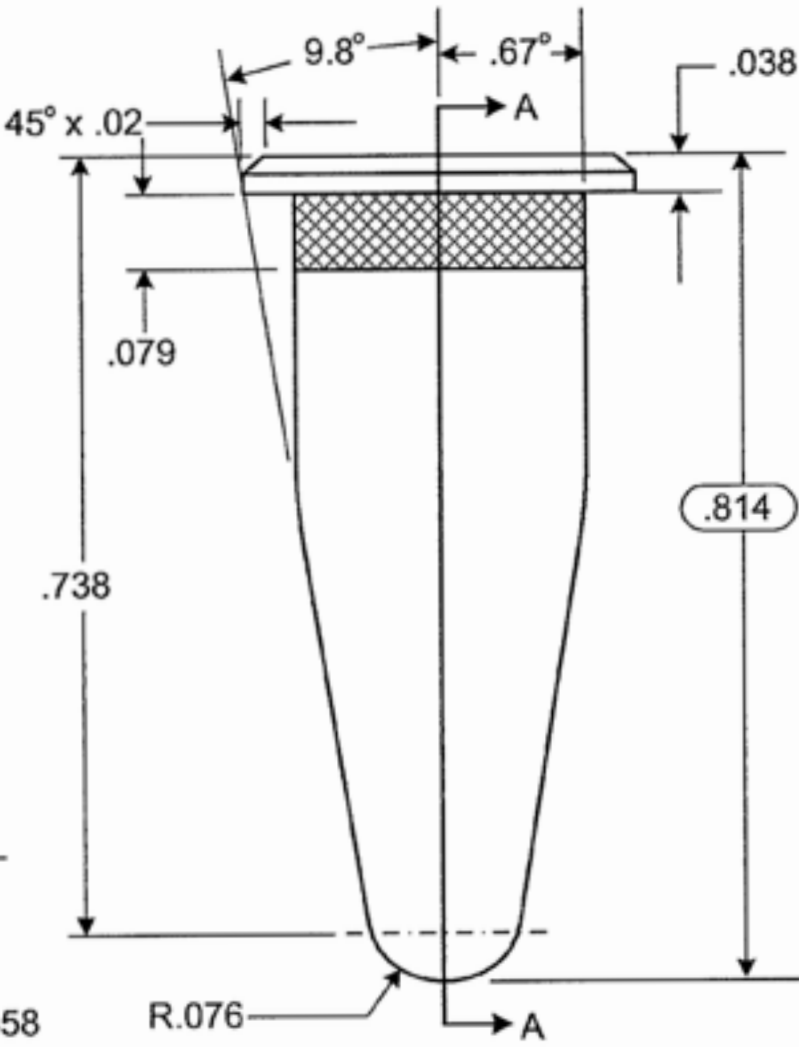
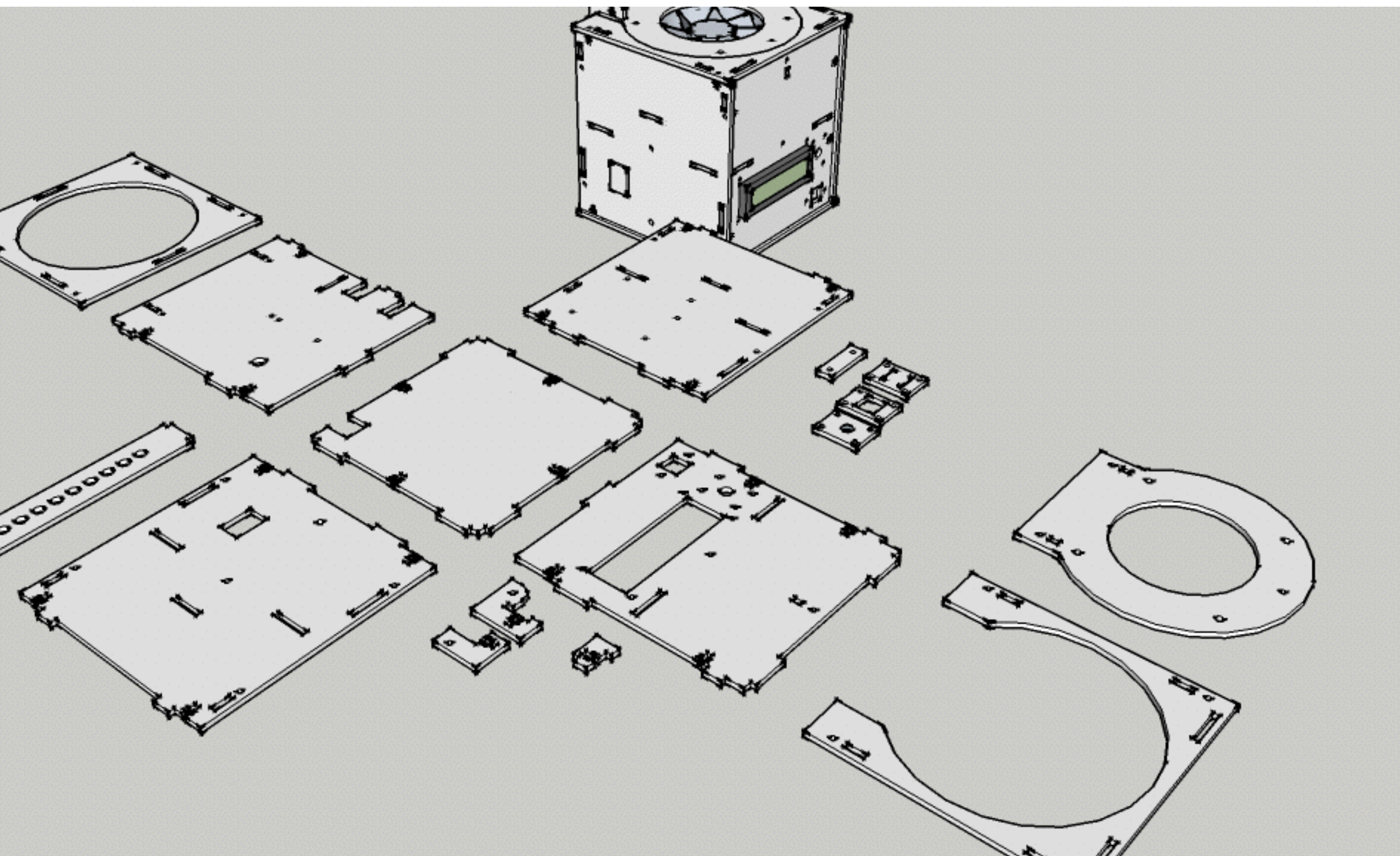


FIG. 4C



Biohack Academy Thermocycler



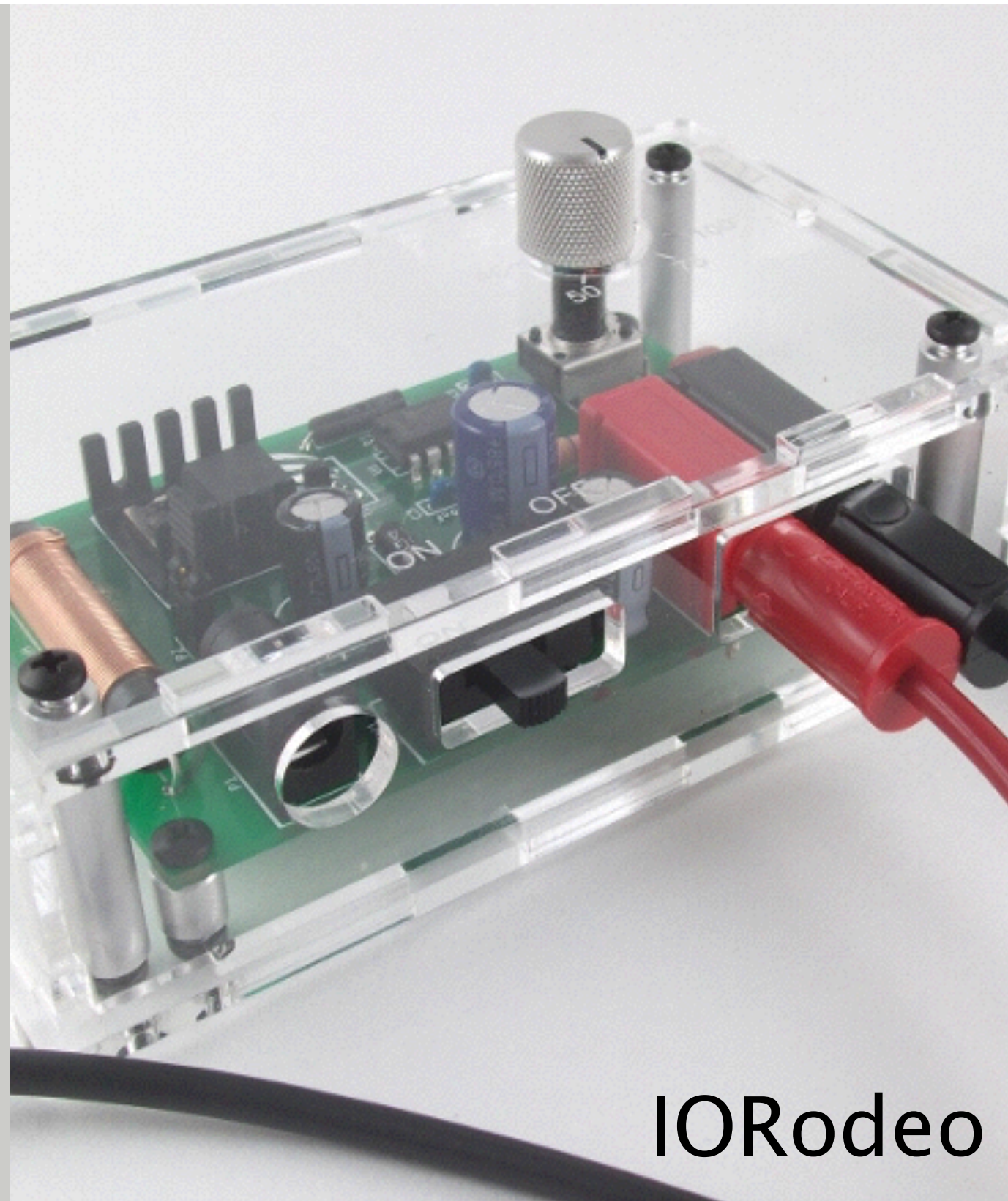
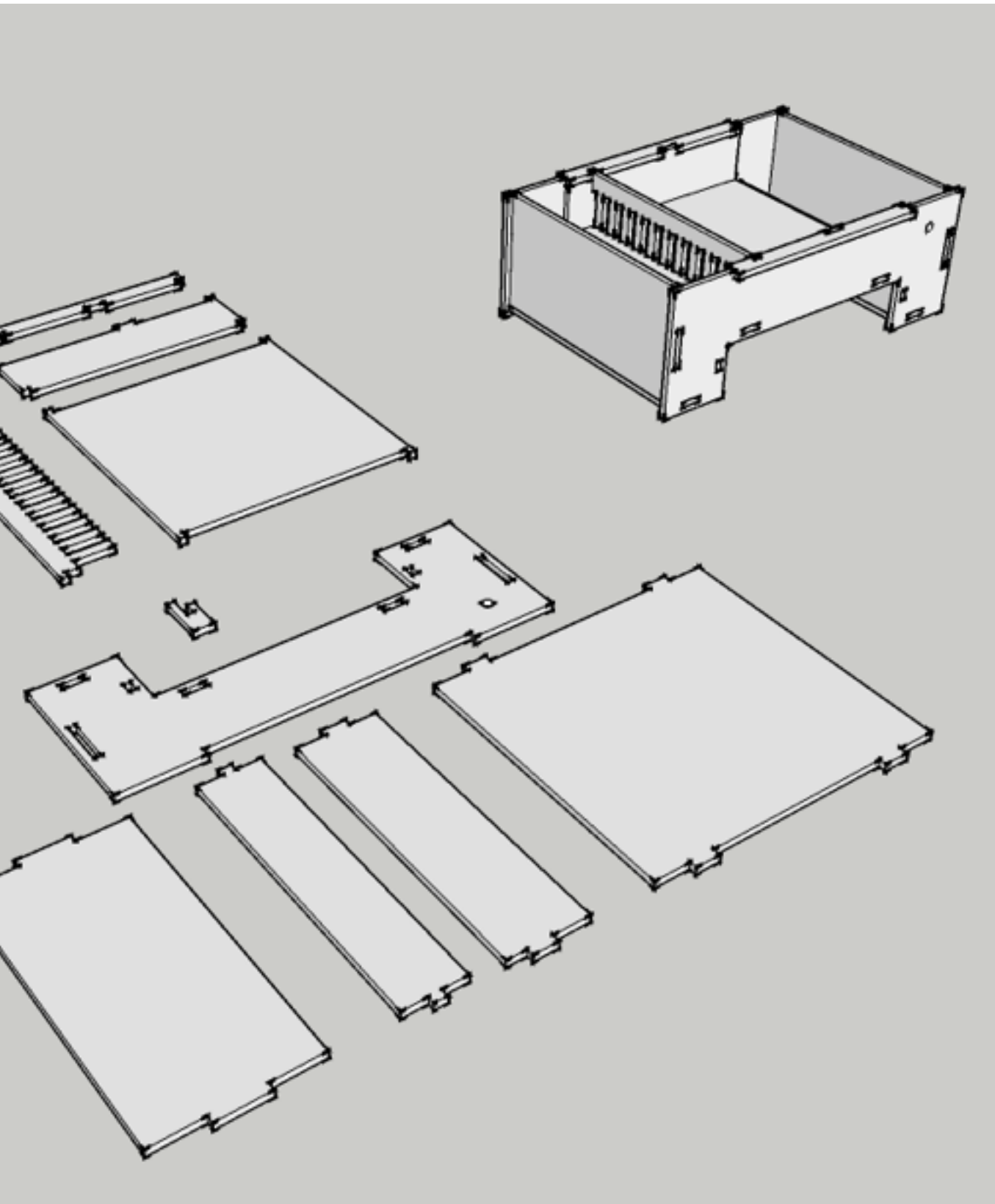


Bill of Materials

No	Amount	Description
1	1	Heating foil
2	1	Water proof temperature sensor (*1)
3	1	Rotary encoder
4	1	Knob
5	1	Power switch
6	1	DC power jack
7	1	12V 5A Power supply
8	1	Push button
9	2	10K resistor
10	4	Rubber feet
11	1	Sheet of 45cm x 95cm 3mm MDF
12	1	I2C LCD display
13	1	MOSFET
14	1	12V 80 mm Axial Fan



Gel rig and power supply



IORodeo



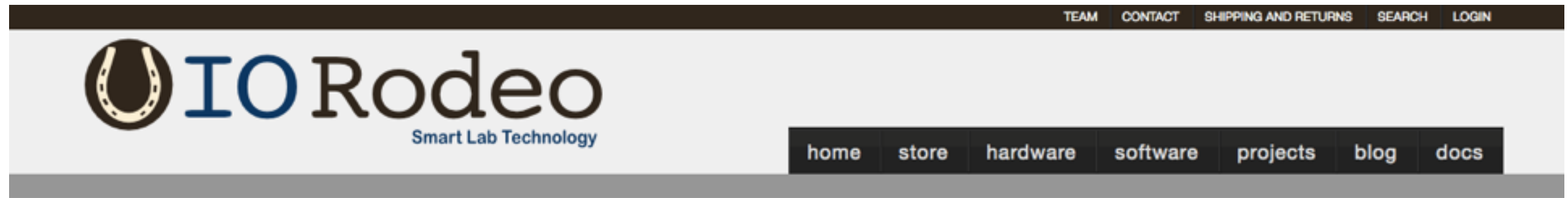
Bill of Materials Gel Box

No	Amount	Description
1	1	Banana adapter (black)
2	1	Banana adapter (red)
3	1	Banana cable (black)
4	1	Banana cable (red)
5	1	3mm Acrylic sheet
6	1	Acryl glue
7	1	Platinum Wire



IORodeo kit

<http://www.iorodeo.com/content/electrophoresis-power-supply-kit>



Home » Store » Gel imaging » Electrophoresis

Electrophoresis power supply kit

View Posts

SKU: IMG-08

Kit for making a 25-100 V variable power supply for electrophoresis as described in this [Documentation](#).

Each electrophoresis power supply kit comes with the following parts:

- **Power supply PCB**
- **Electronic components** - 20 through-hole components for soldering onto the PCB
- **Enclosure** - The kit comes with a acrylic enclosure with different color options available. The enclosure is very easy to assemble. We recommend using an enclosure when the power supply is in use. For makers that prefer to design a custom enclosure we have added the option to purchase the kit without the enclosure in the options below
- **Hardware** - All of the hardware for making the power supply including screws, standoffs and mini-screwdriver

Additional accessories you will need:

- 15V, 1.6A power supply with a 2.1mm plug, center +ve
- Banana jack/banana plug cables for connecting to the [mini-gel electrophoresis tank](#)

Price: \$65.00

Select acrylic enclosure color from these options:: *

- ☐ Amber
- ☐ Blue
- ☐ Clear
- ☐ Green



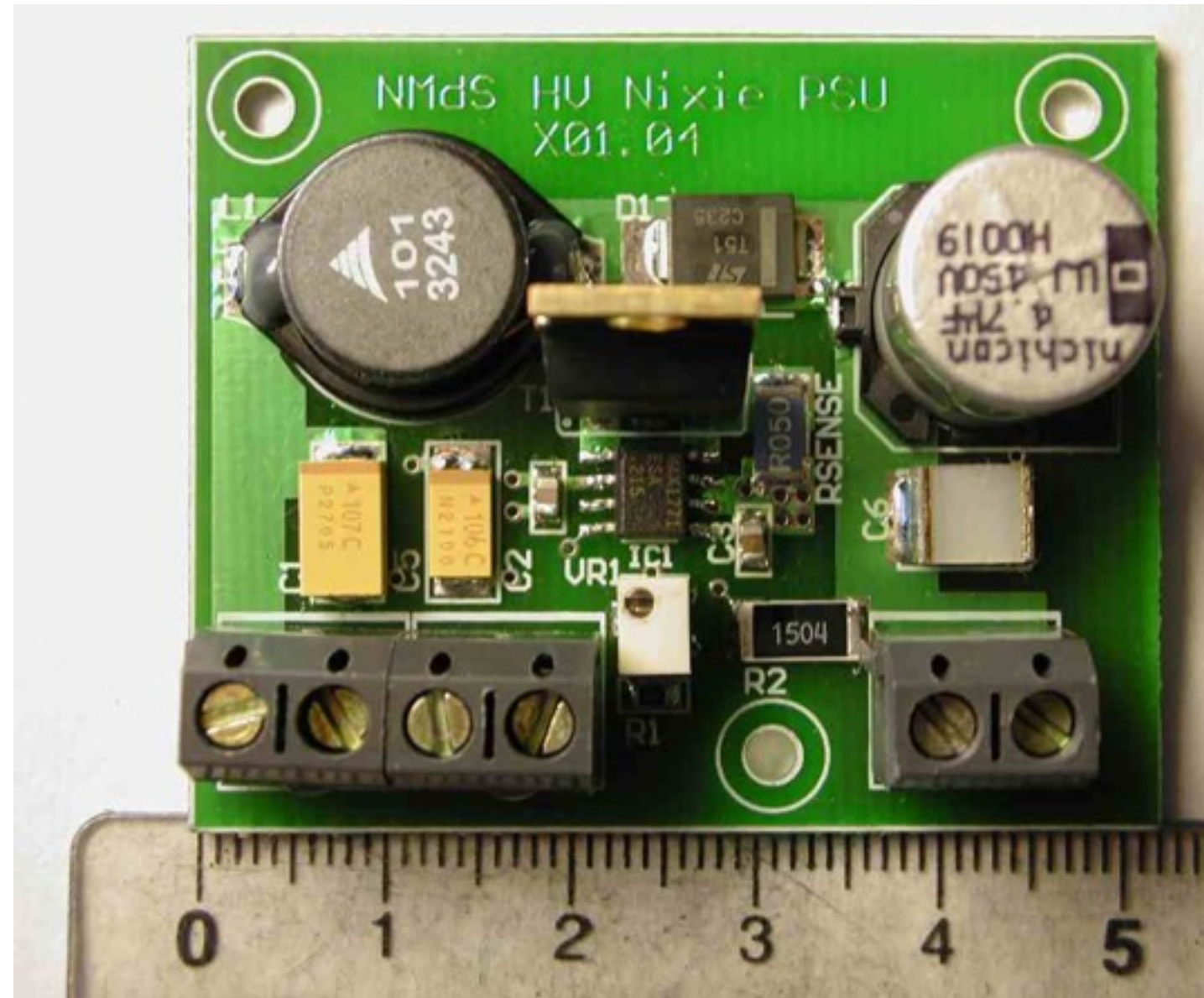
\$65.00



Nixie Power Supply

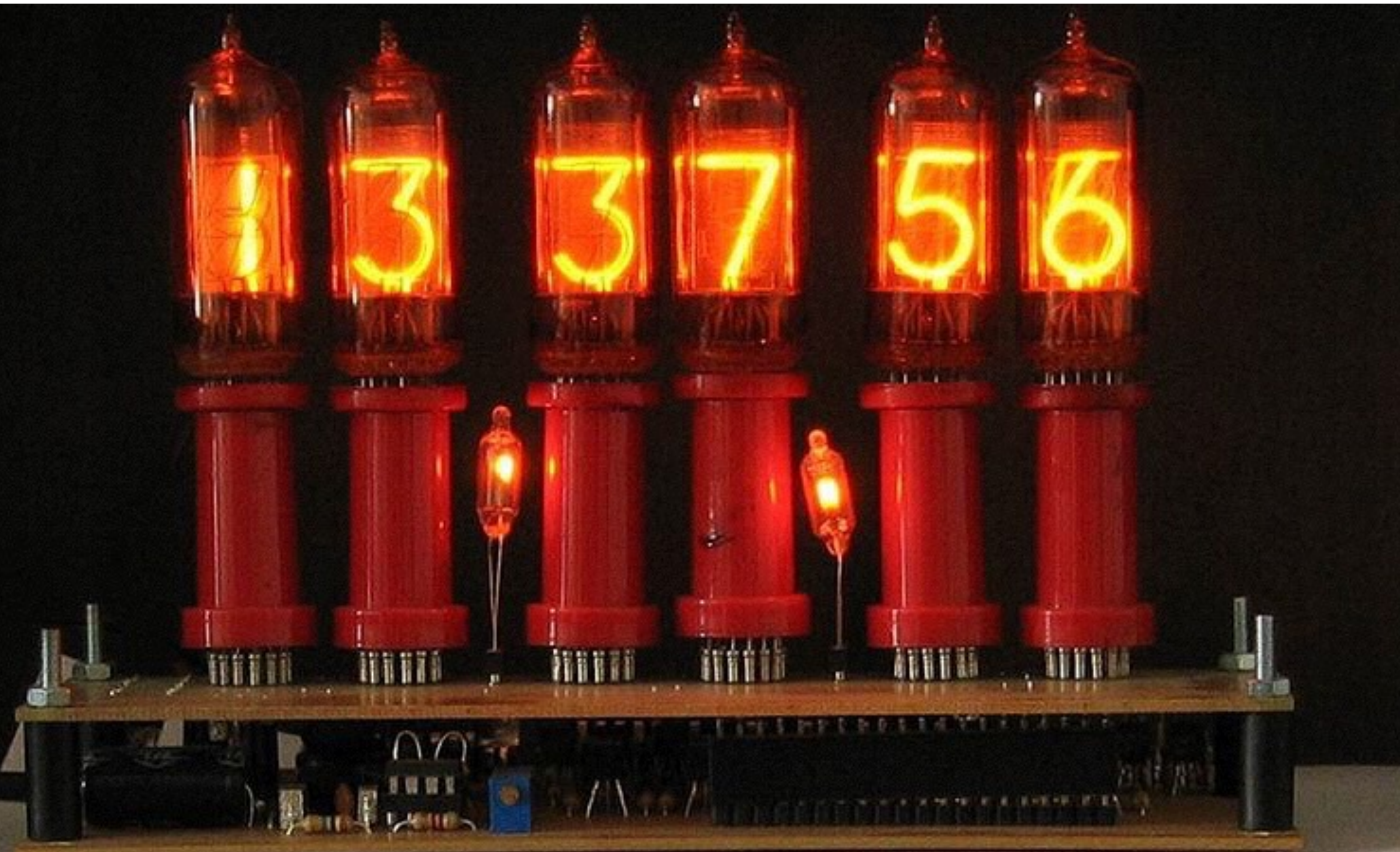
Nick De Smith

[http://www.desmith.net/
NMdS/Electronics/
NixiePSU.html](http://www.desmith.net/NMdS/Electronics/NixiePSU.html)





What's a Nixie?





Next week schedule

- Monday 28: Easter
- Tuesday 29:
 - DNA extraction experiment
 - Prepare your project presentation
 - Evening: project presentations
- Project presentations:
 - 3 minutes talk
 - 2 minutes questions



Documentation



Biohack Academy Syllabus

[About](#)

[Archive](#)

[BHA](#)

Documentation

Please send the link to your documentation site as soon as it is setup to pieter@waag.org. I will add you to the list.

- [Waag Society](#) - Netherlands
 - [Thomas](#)
 - [Jessica](#)
- [SDU](#) - Denmark
- [UNM](#) - USA
 - [Lani Brush](#)
 - [Isaiah Smith](#)
 - [Sean Simmons](#)
- [BioClub](#) Tokyo - Japan



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