



# waag society

institute for art, science and technology



BioHack Academy  
Magnetic Stirrer Design



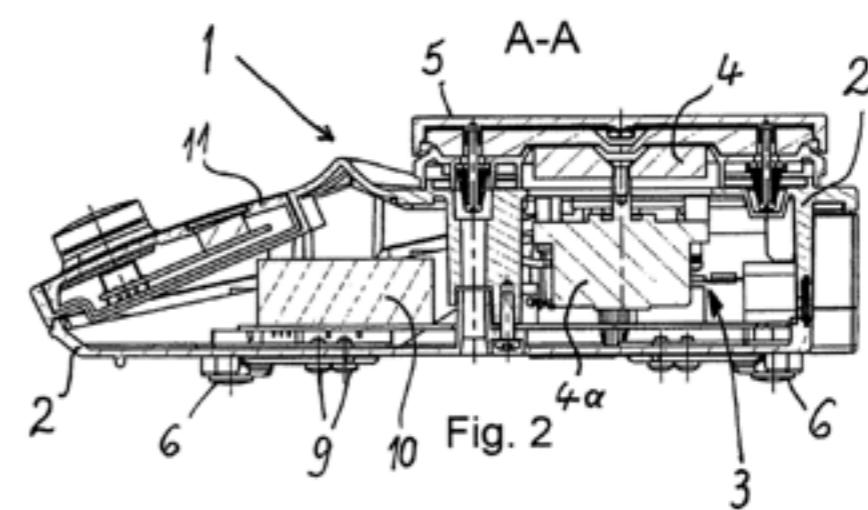
# Magnetic stirrer use

- Mixing reactor content
- Nice to have:
  - Heat the liquid



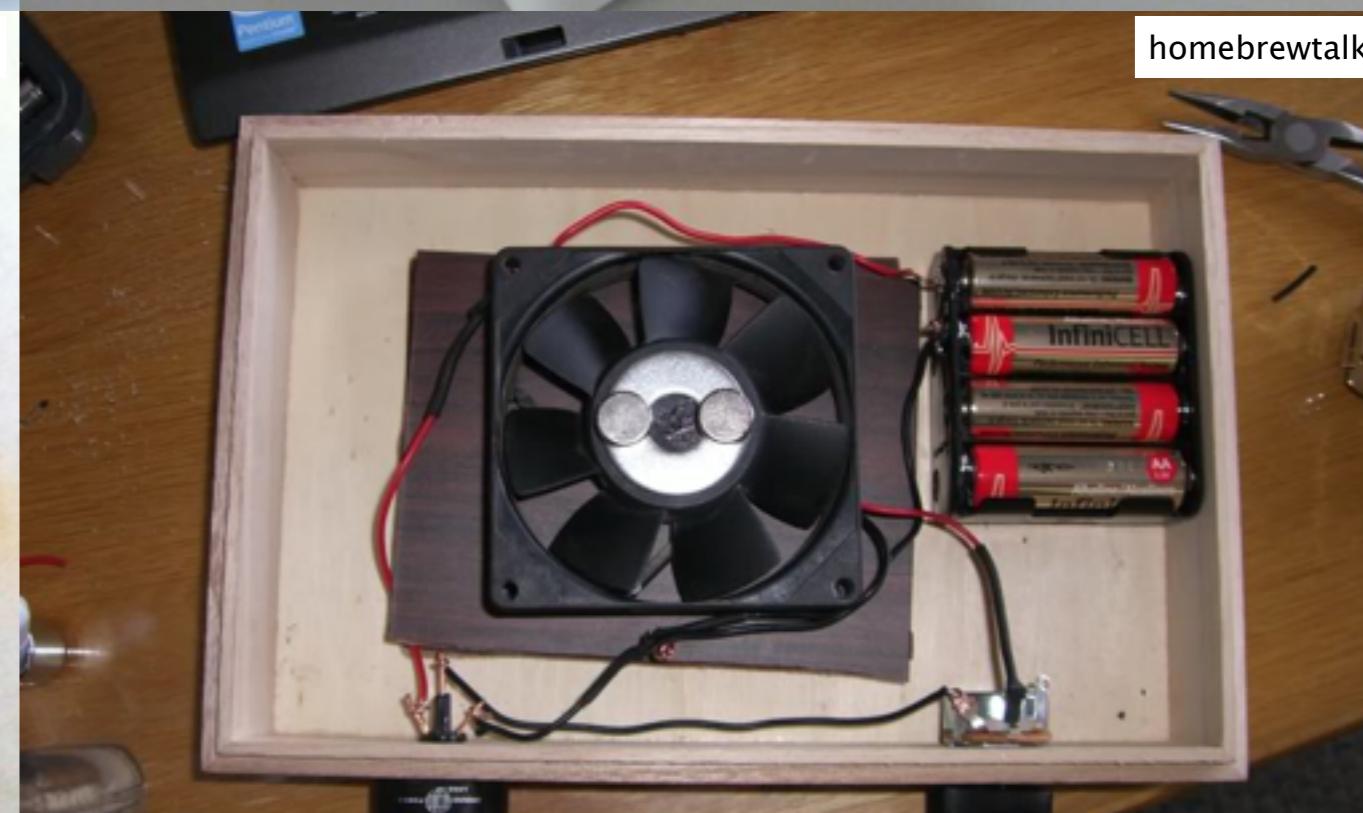
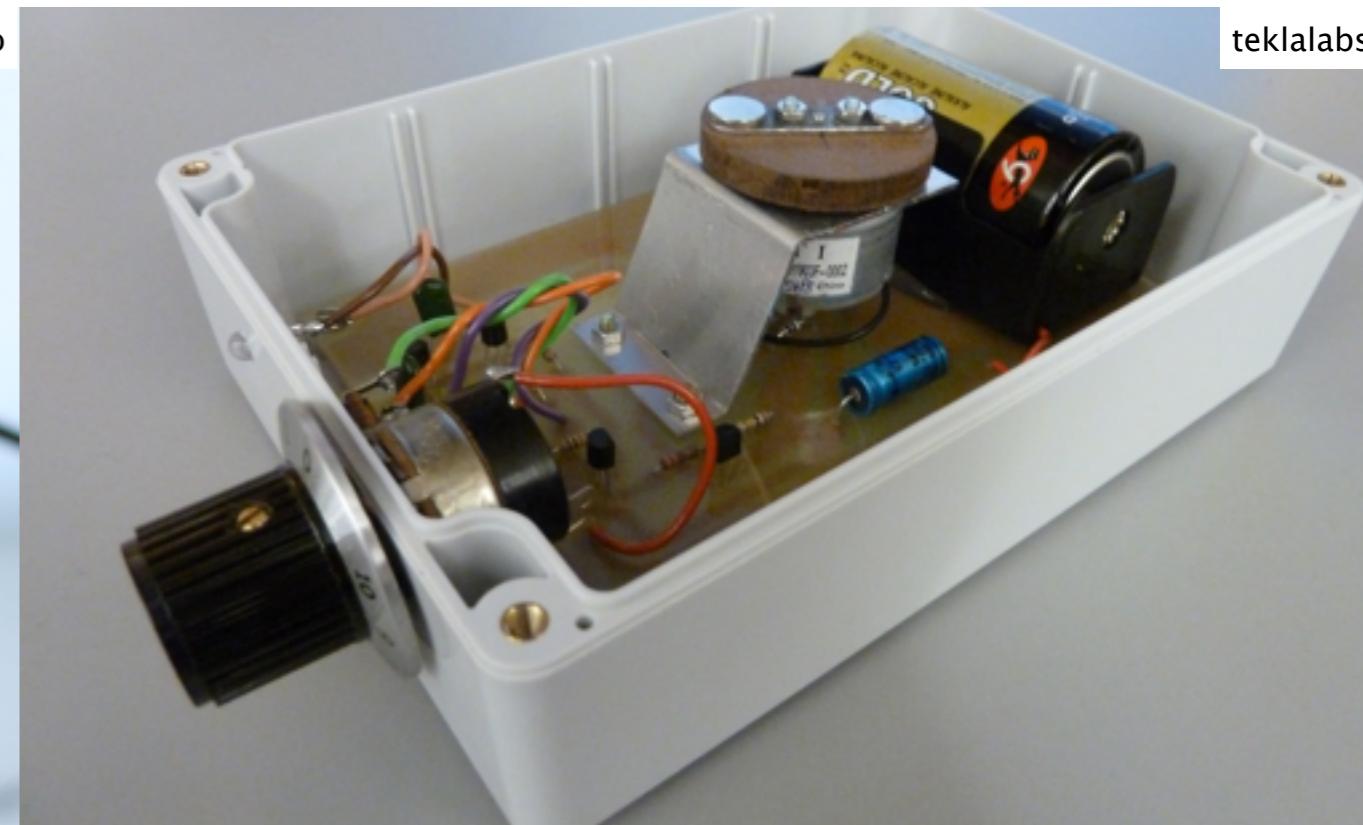
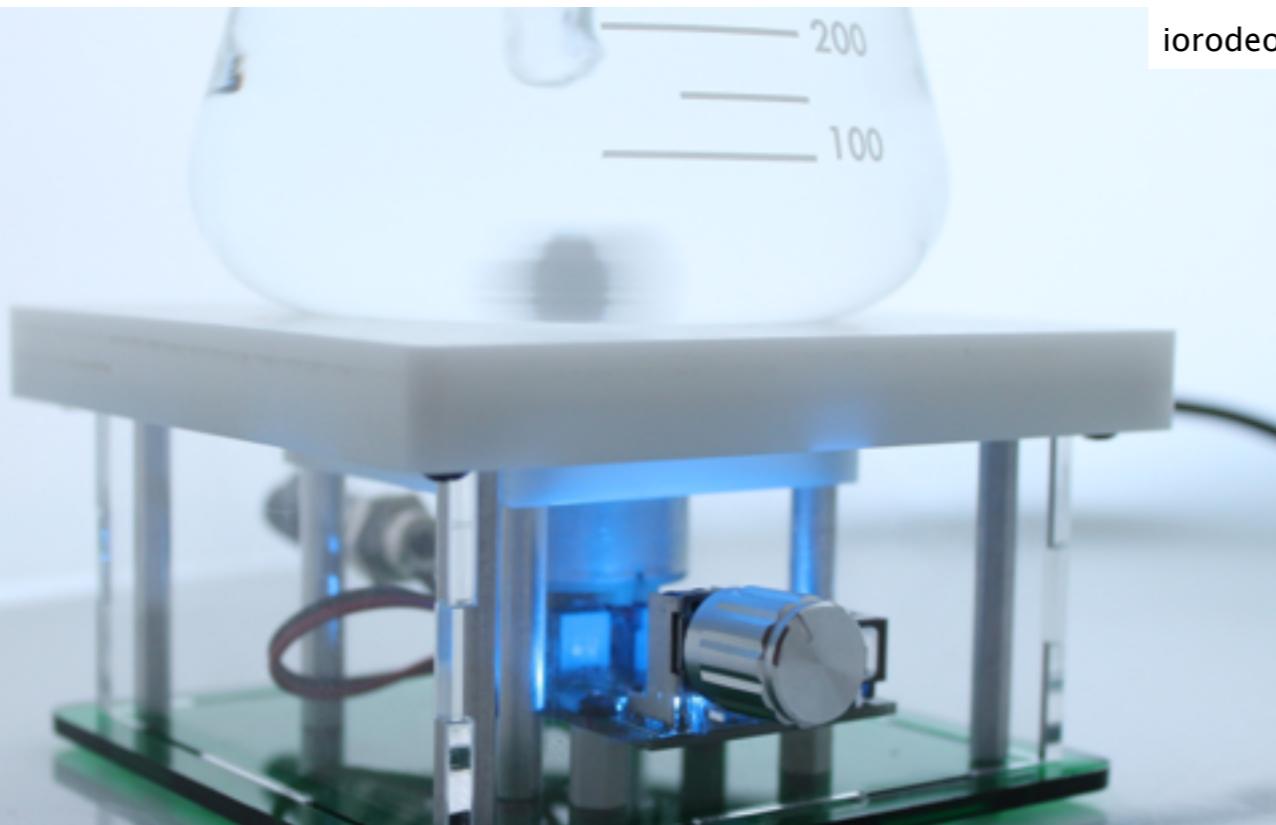


# Industry standard



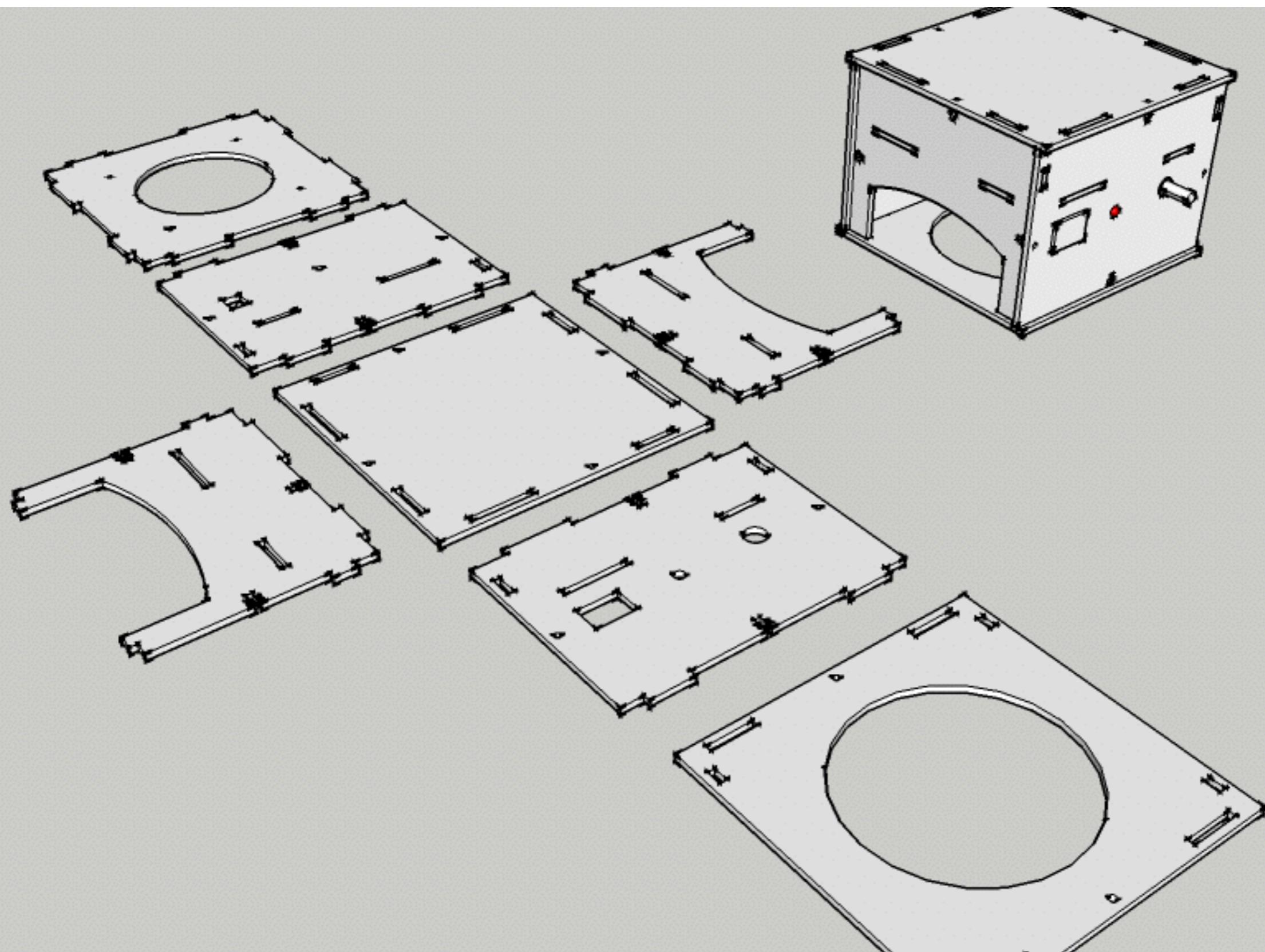


# Stirrer hacks



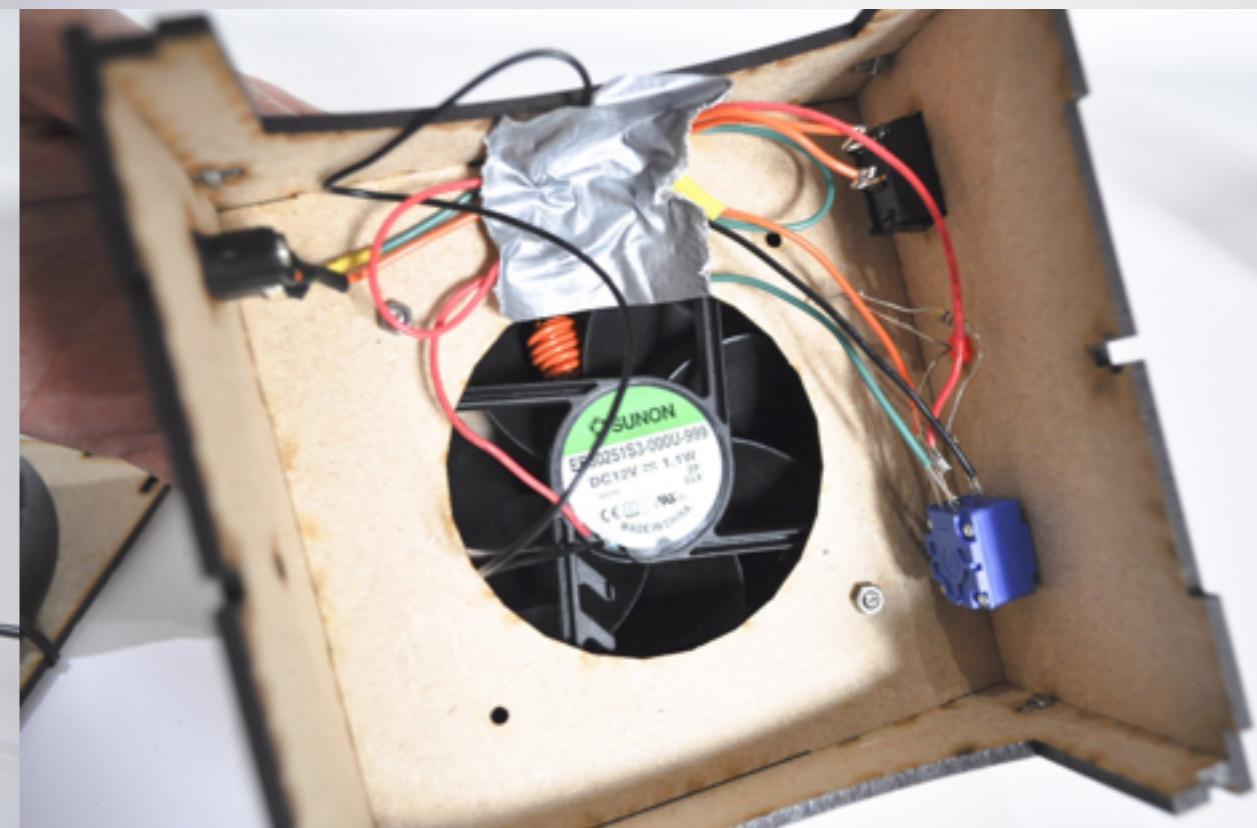
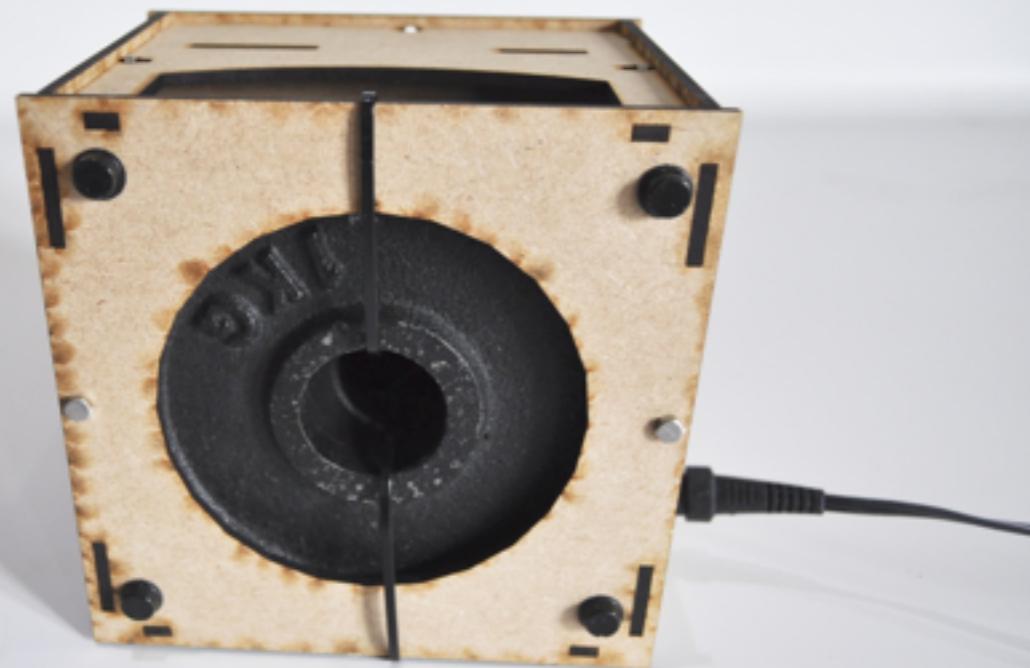


# BioHack Academy Design





# Some pictures



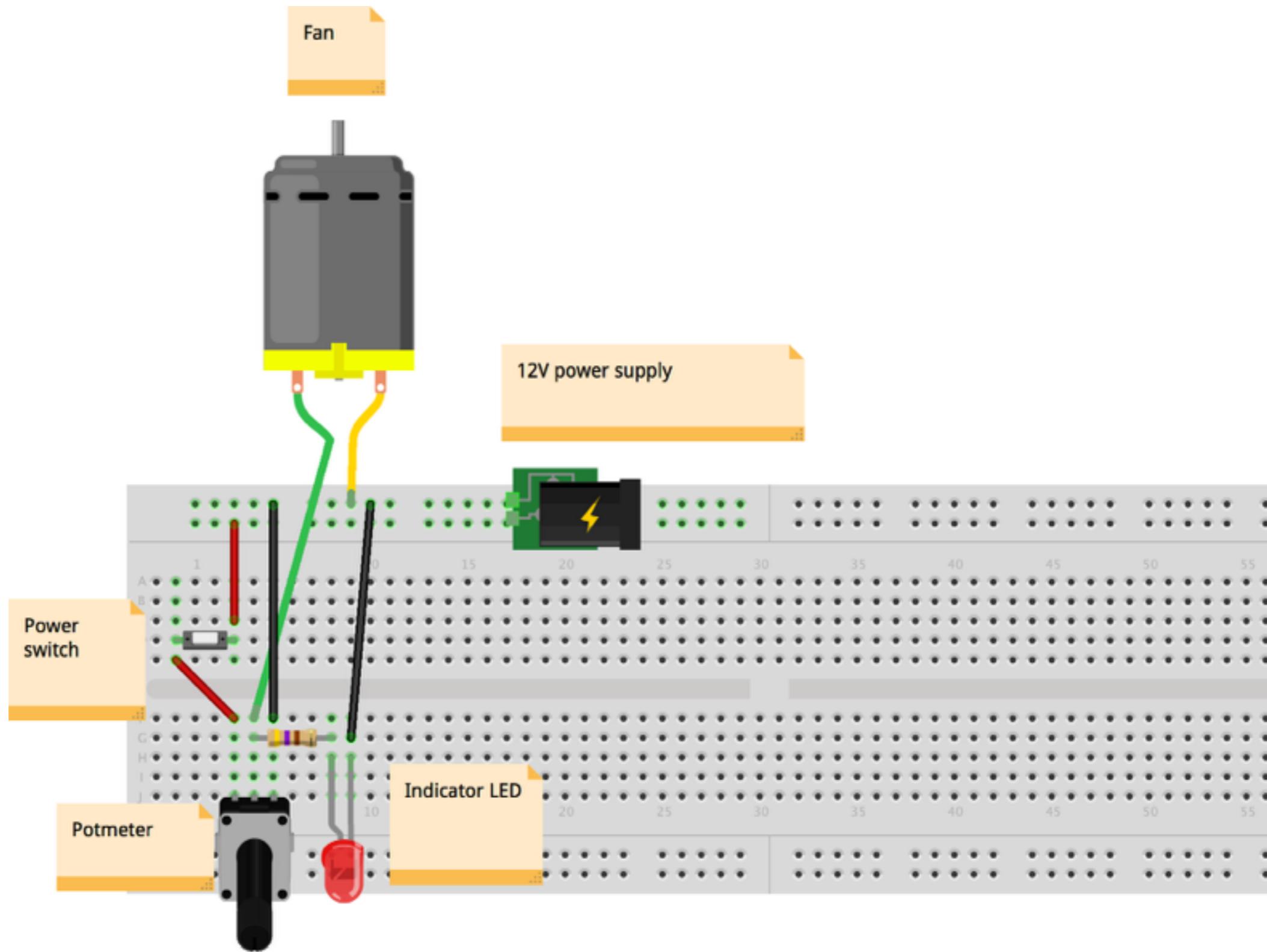


# Bill of Materials

#	Amount	Description
1	1	Fan
2	2	Permanent magnets
3	1	Potentiometer 100 ohm 2W
4	1	Knob
5	1	Power switch
6	1	Power jack
7	1	Power supply
8	1	Red LED
9	1	470 ohm resistor
10	1	Magnetic stirring rod
11	1	Heavy weight, max 12 cm diameter
12	4	Rubber feet

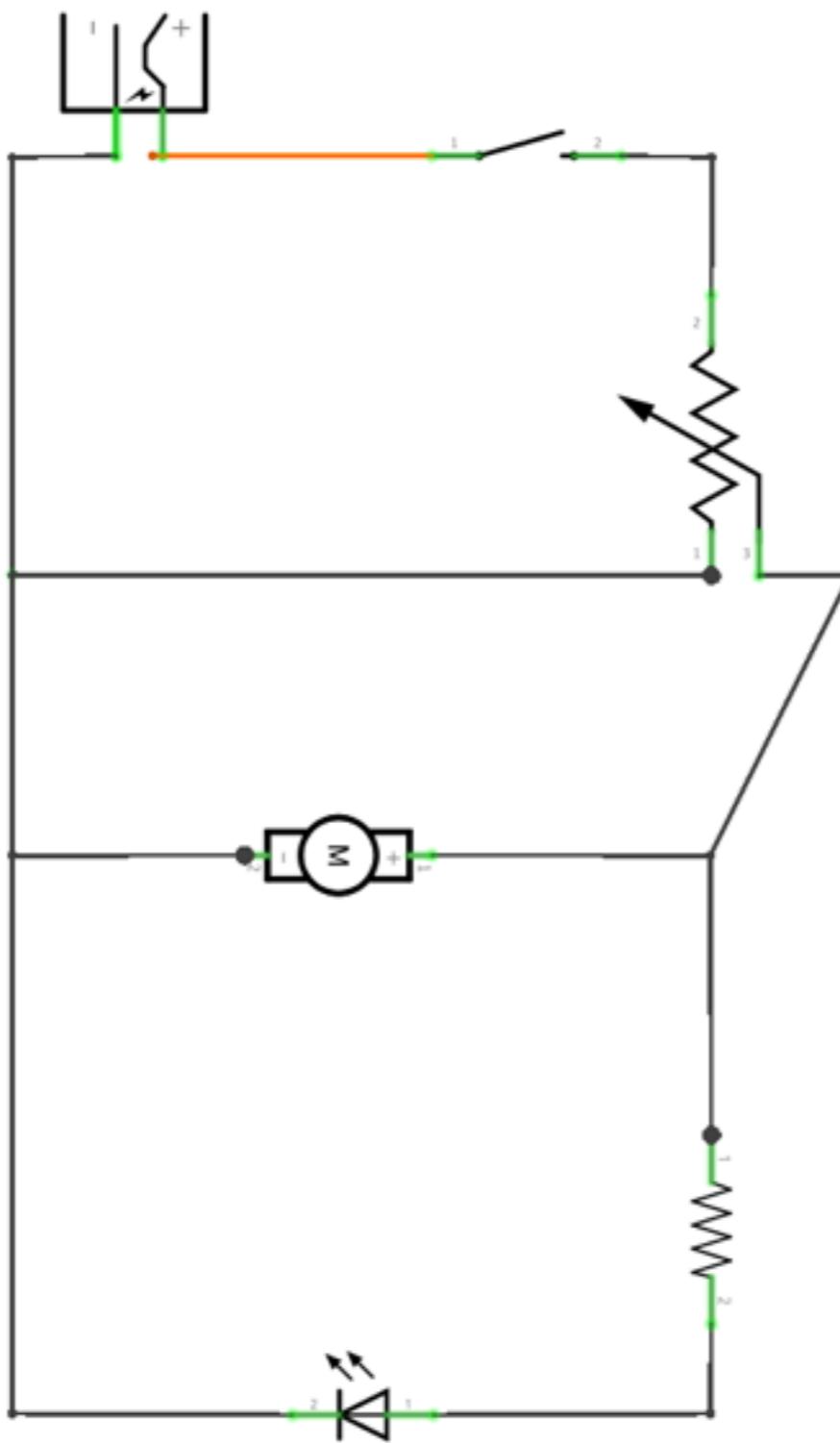


# Wiring





# Wiring scheme

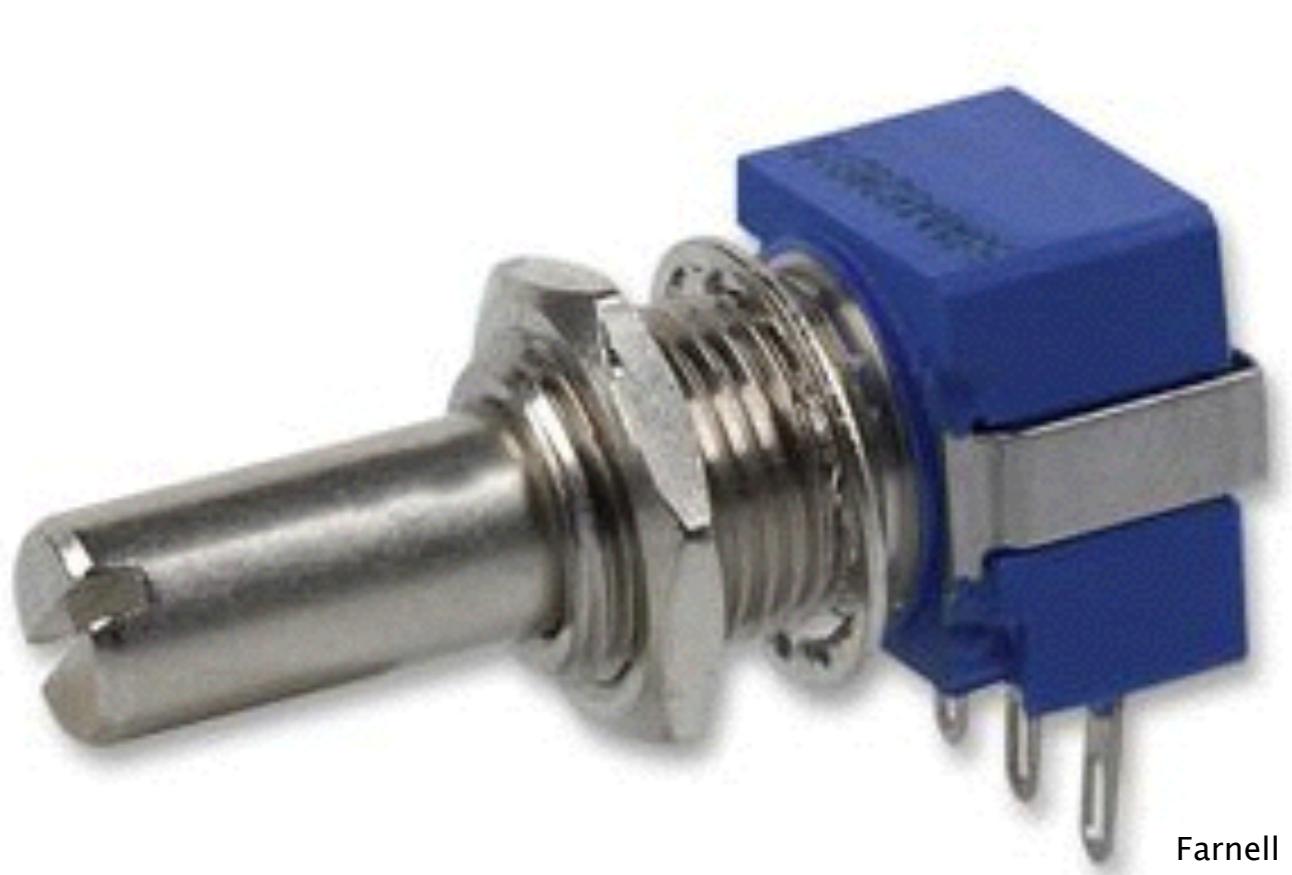


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# Choosing a potmeter

- 0.15 Ampere fan
- Resistance Fan = Voltage / Current
- Resistance Fan =  
 $12 / 0.15 =$   
80 Ohm
- So 100 Ohm to be sure



Farnell



# Choosing LED resistor

- LED forward voltage = 2.4
- Max current = 20 mA
- $R = V / I$
- $R = (12 - 2.4) / 0.02 = 480 \text{ ohm}$
- 470 ohm will be fine too



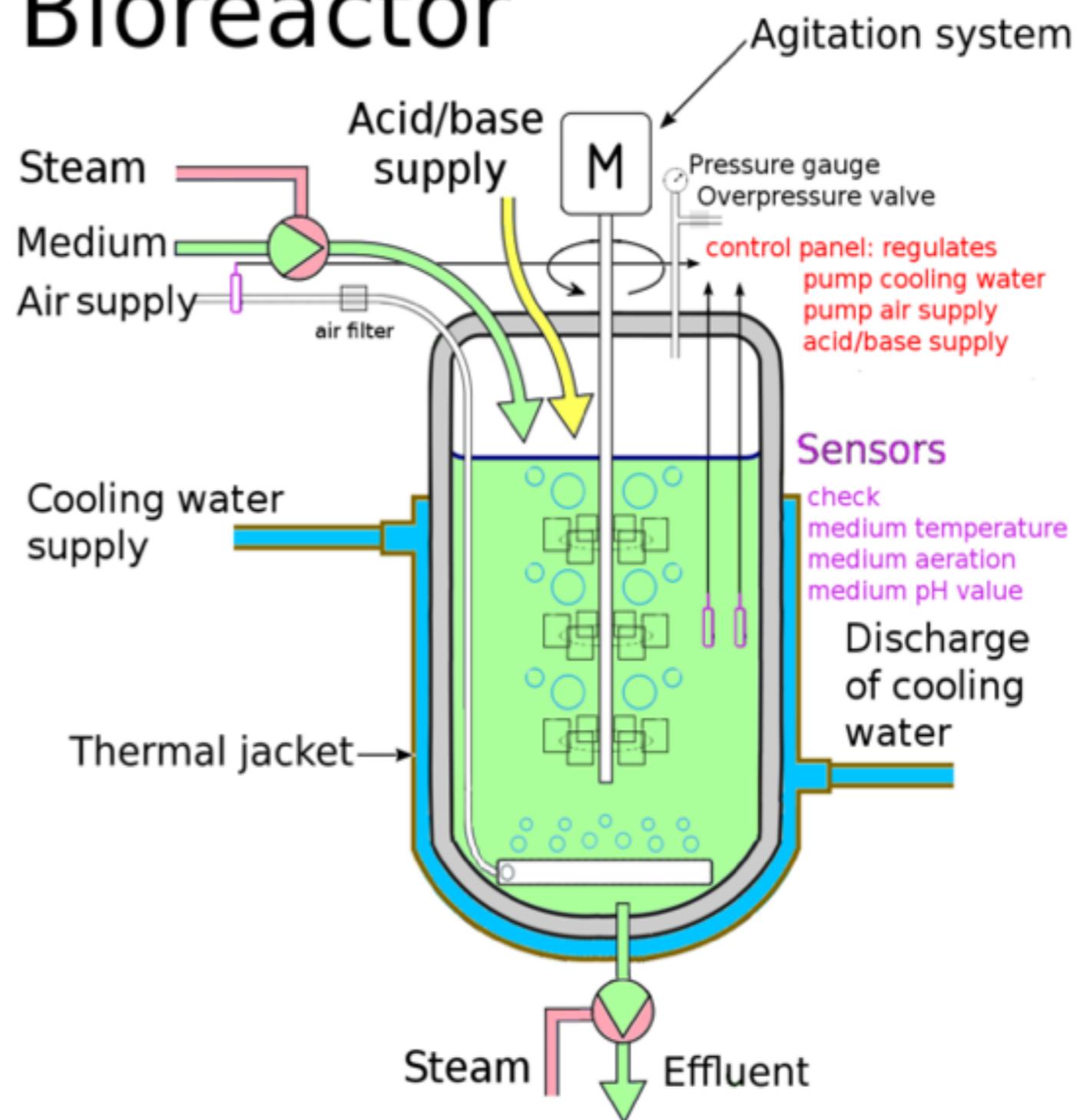
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# Assignment

Design your bioreactor dimensions and fluxes.

## Bioreactor





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