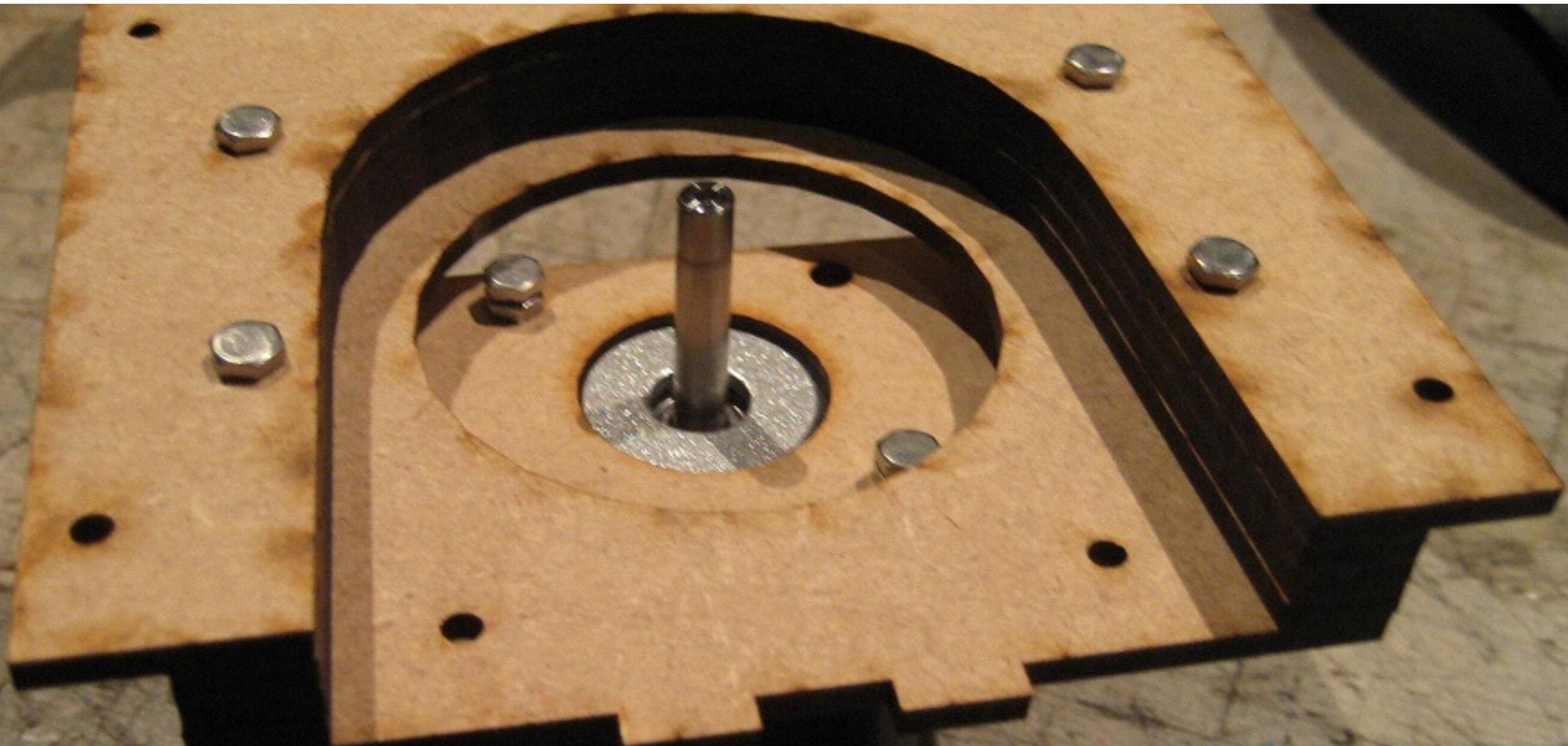




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BioHack Academy  
Mechanical Design



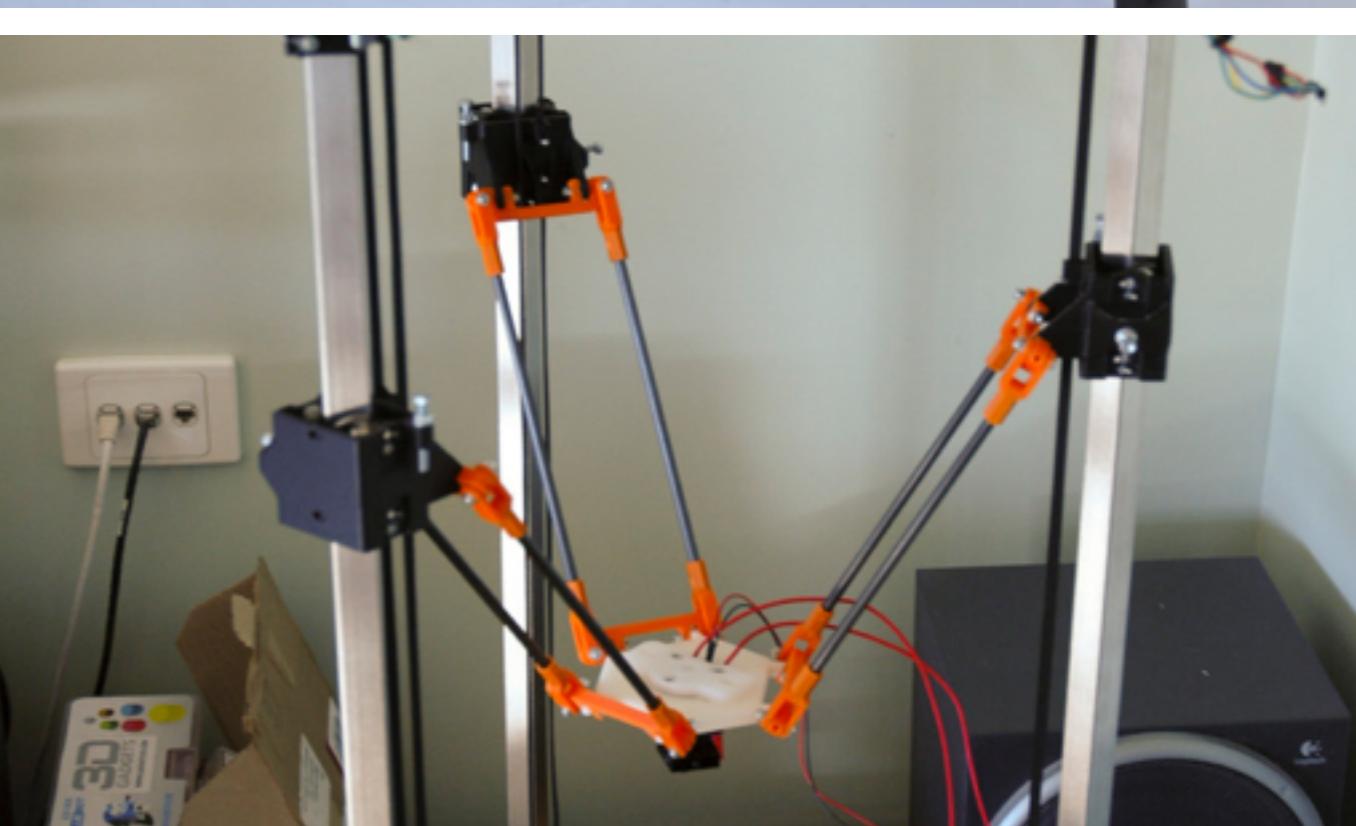
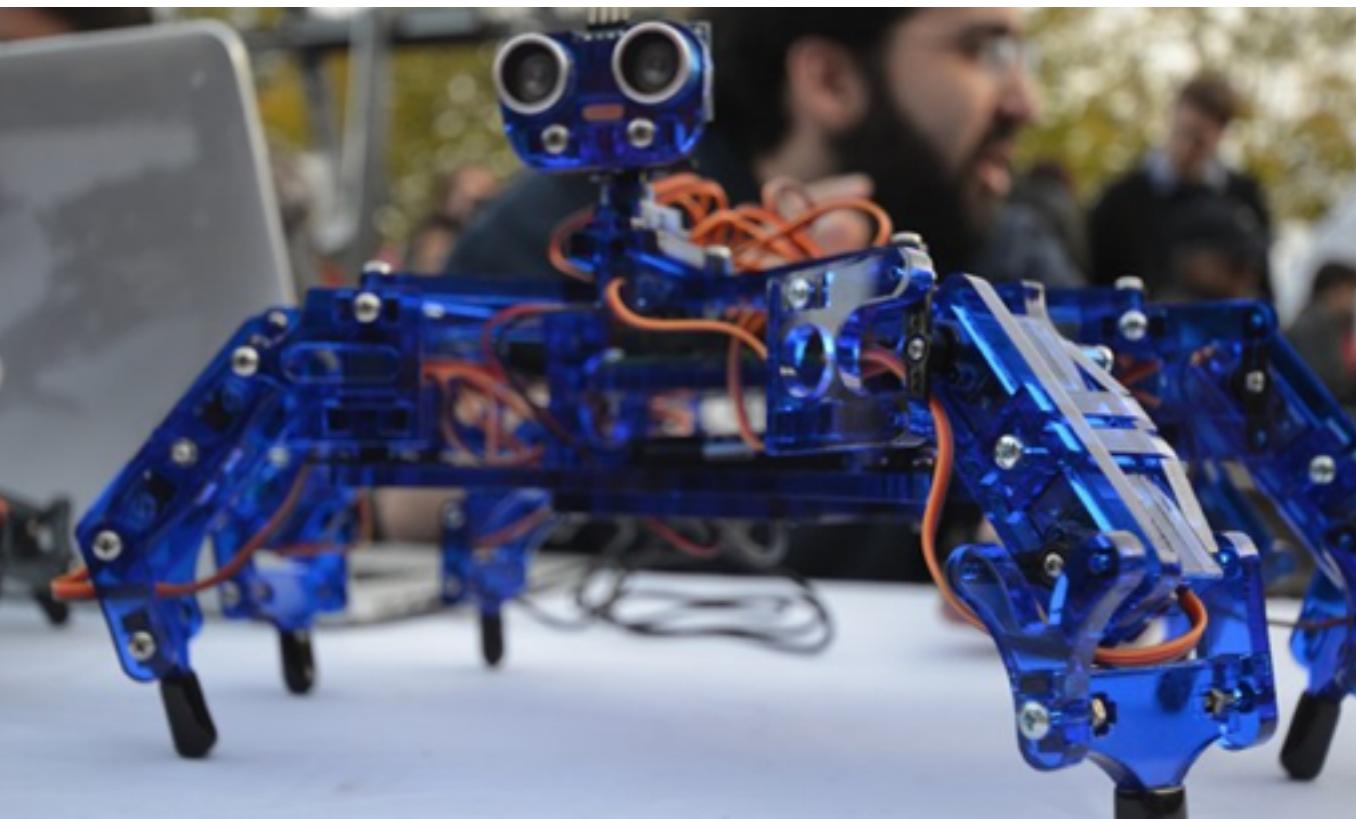
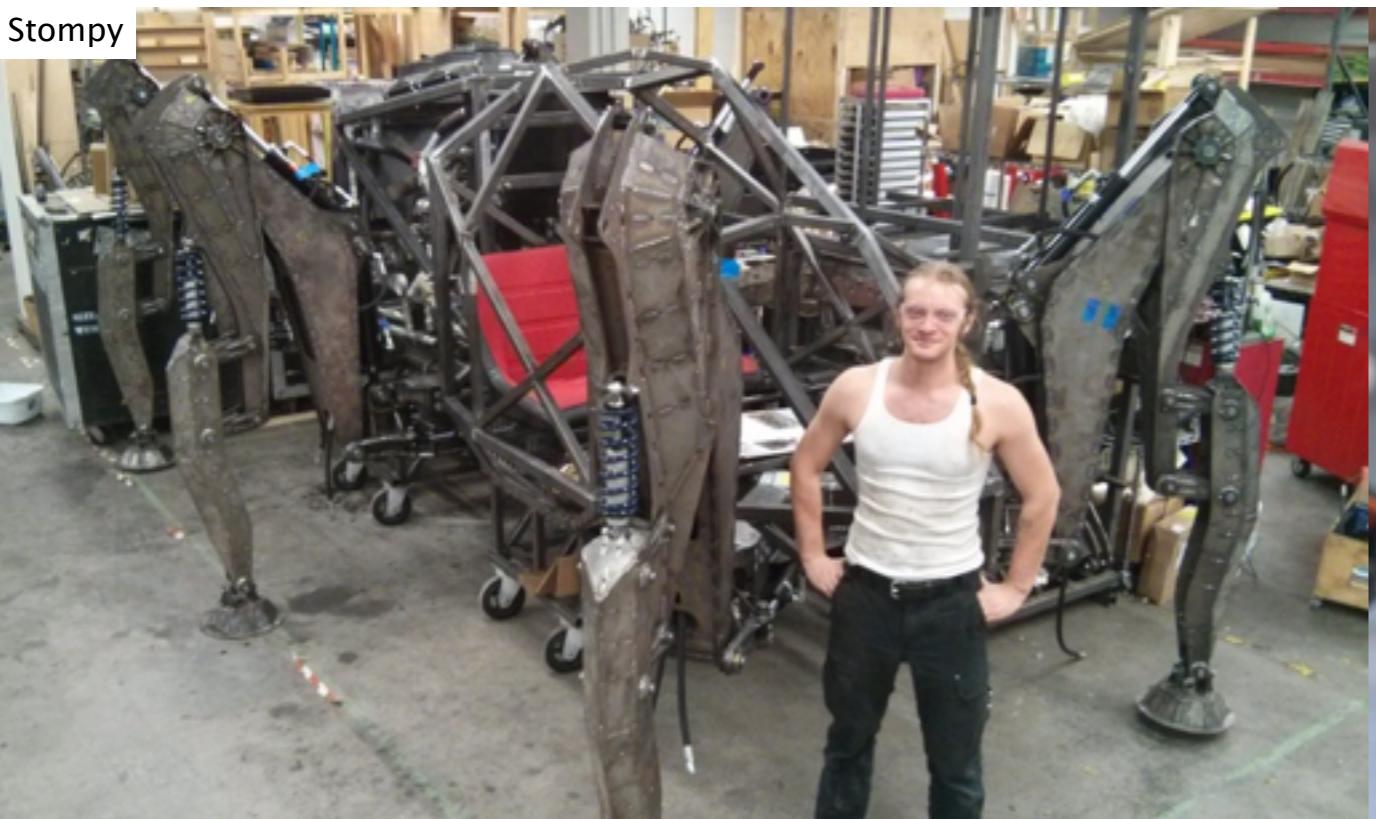
# Maker Movement

## THE **MAKER** MOVEMENT MANIFESTO





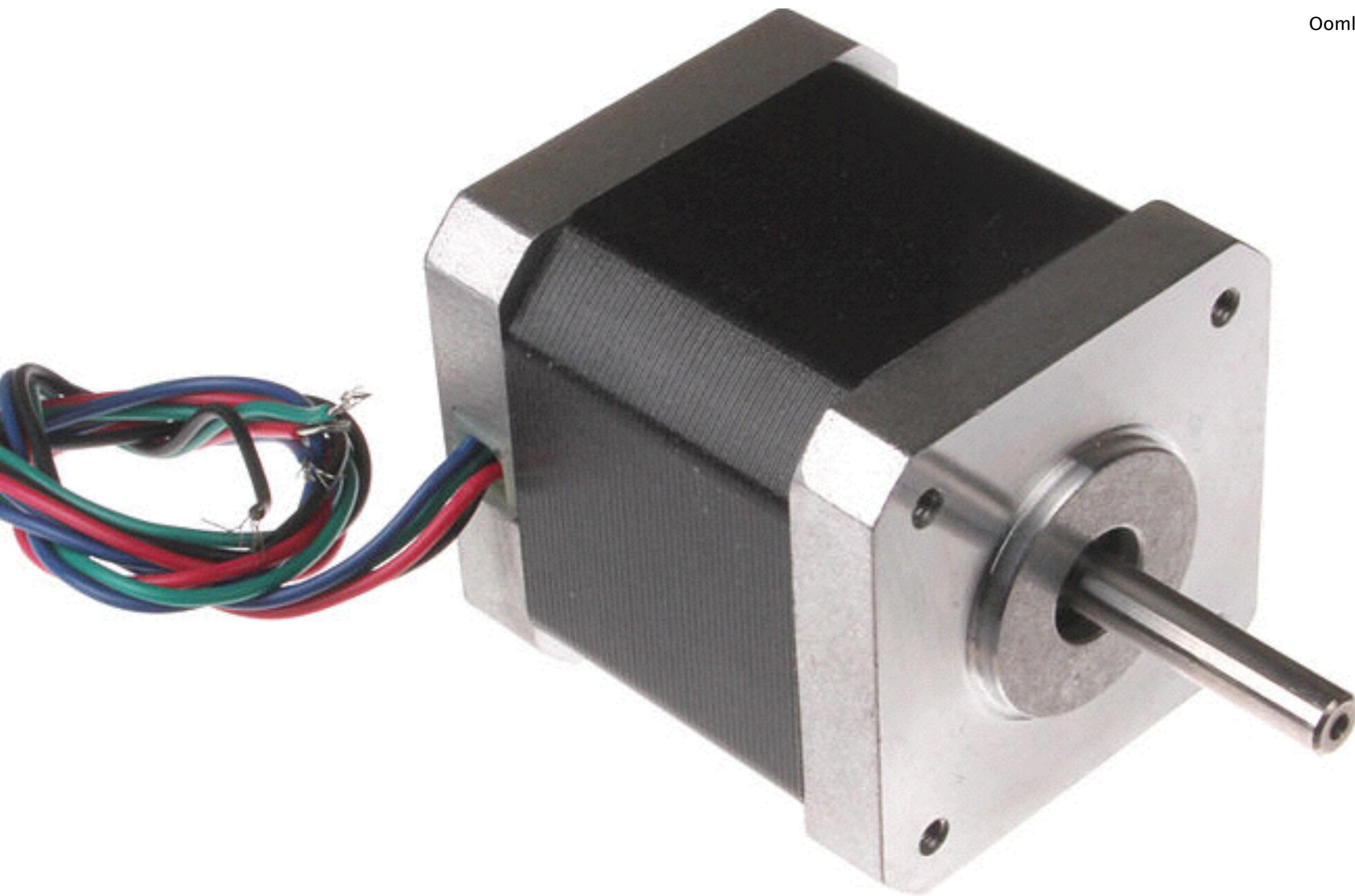
# Maker Movement





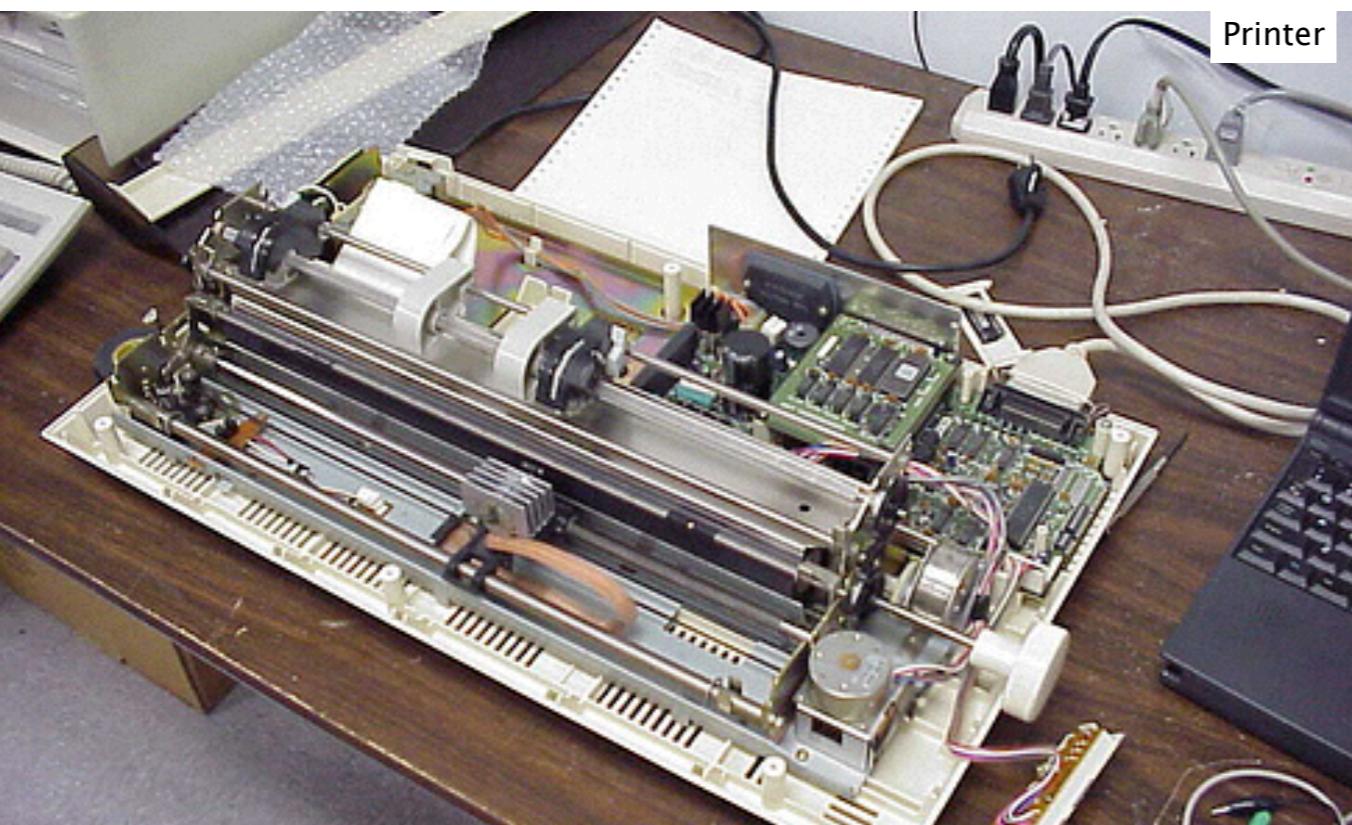
NEMA17

Oomlout - CC-BY-SA 2.0



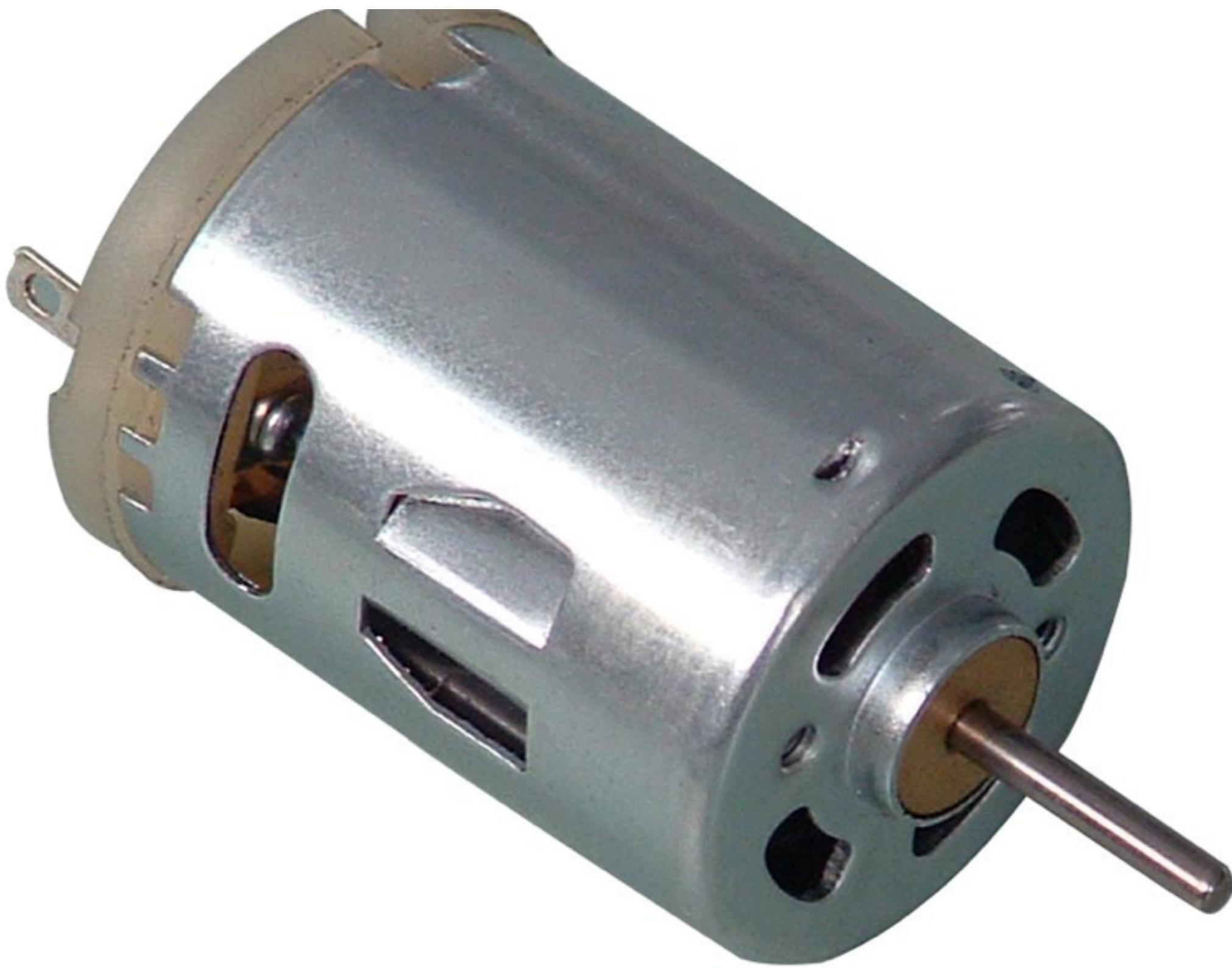


# Where to find stepper motors





# DC Motor



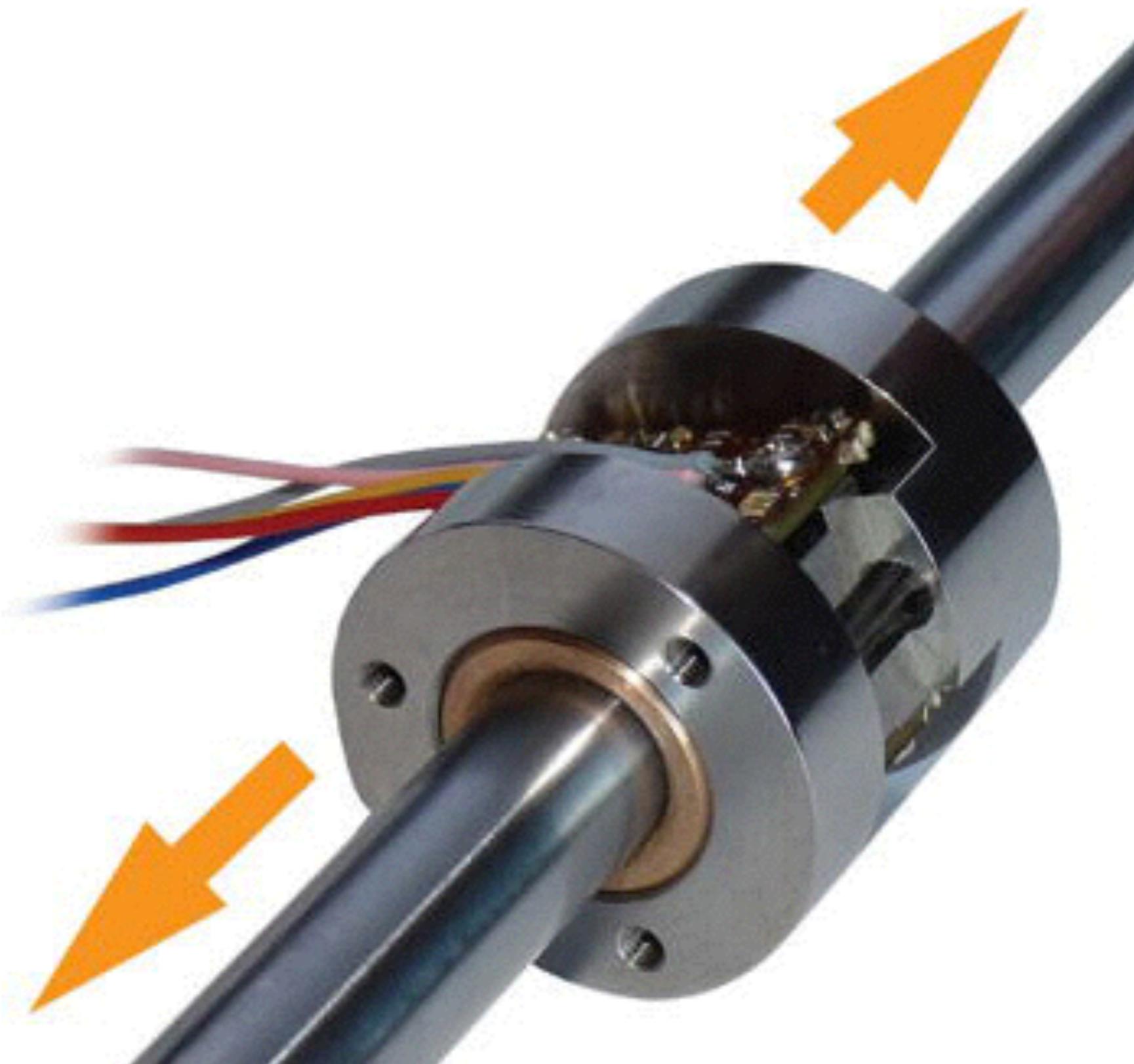


# Where to find DC motors





# Magnetic Actuator





# Ways to make things move

Timing Belt



Terabase CC-BY-SA 3.0

Chain



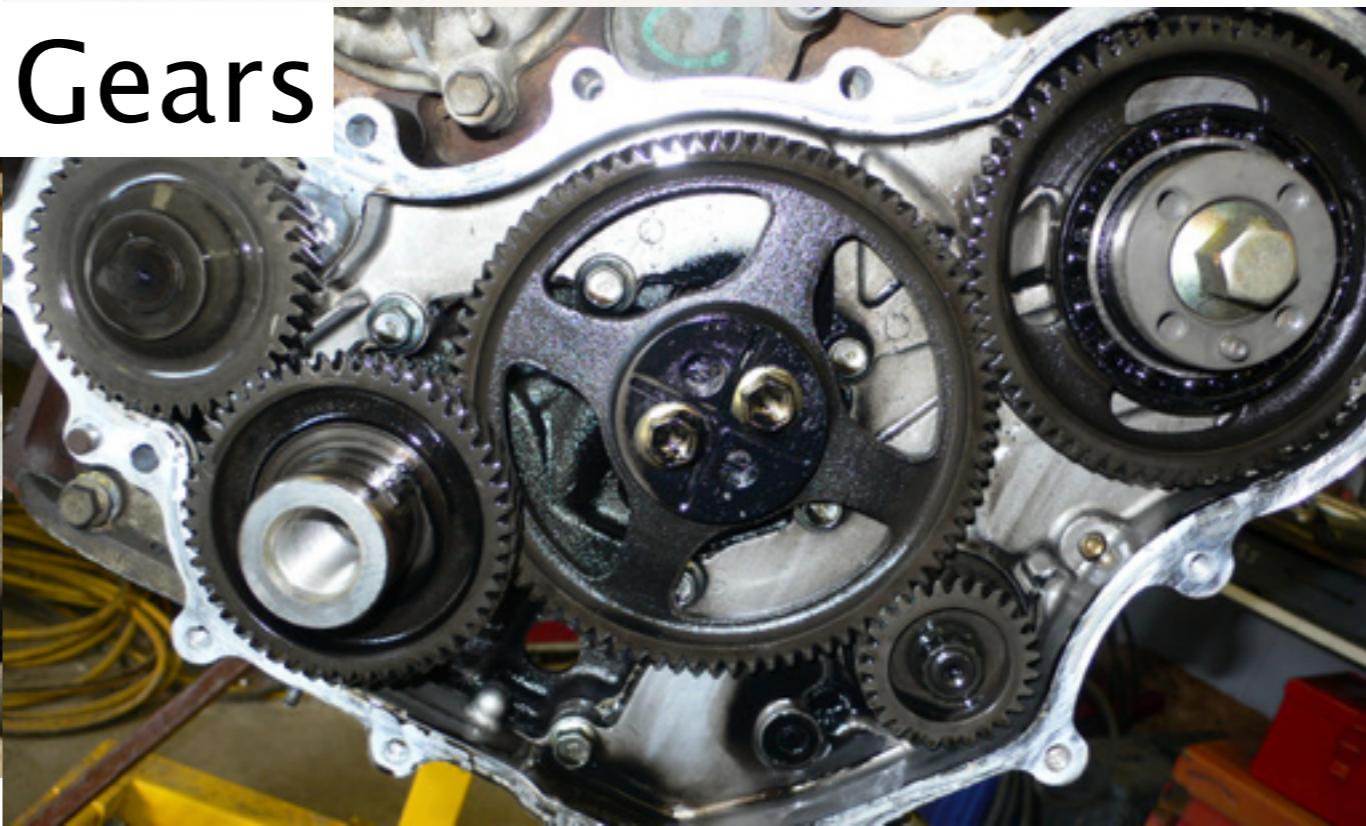
Andrew Dressel - CC-BY-SA 3.0

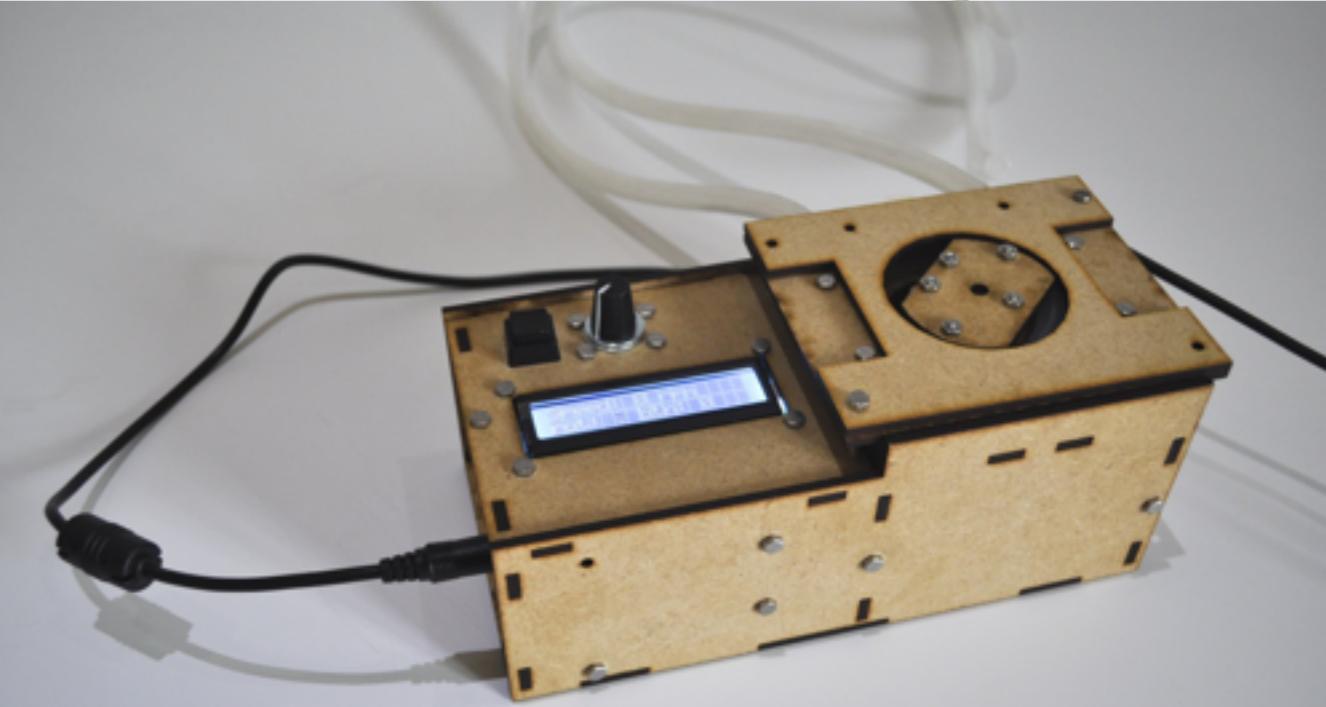
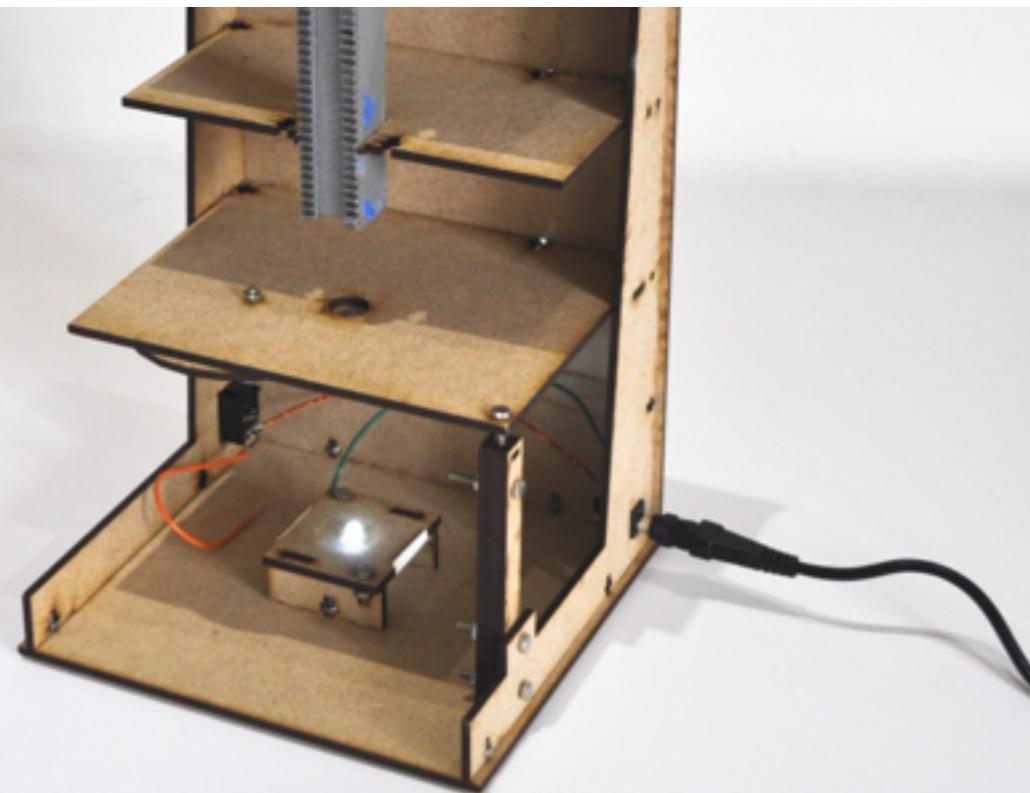
Shaft



Ralf Roletschek - CC-BY 3.0

Gears







# Hinging





# Folding





# Tension





# Sliding





# Nesting





# Inflatables





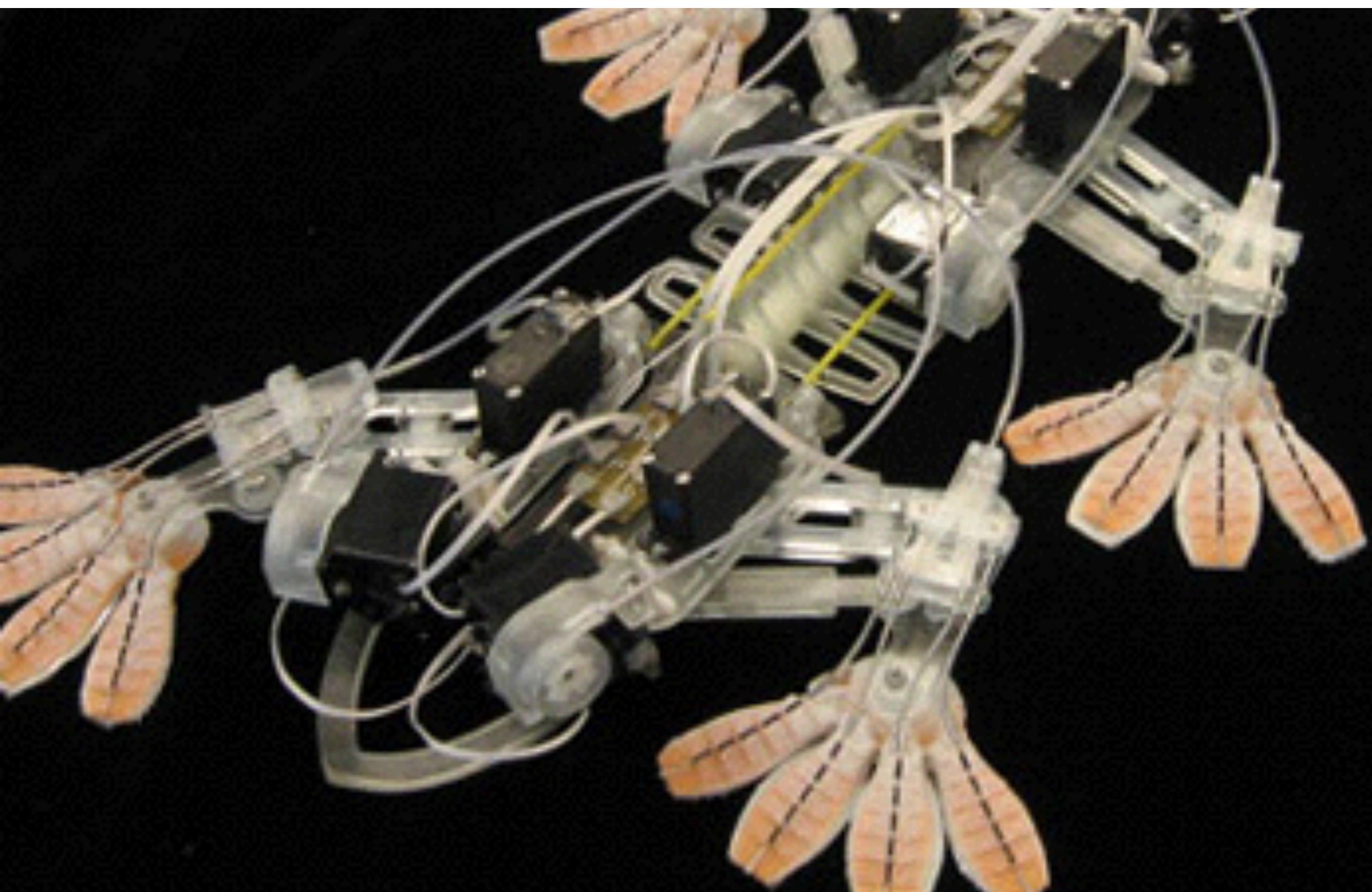
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# Movement in Biology



# Biomimetics





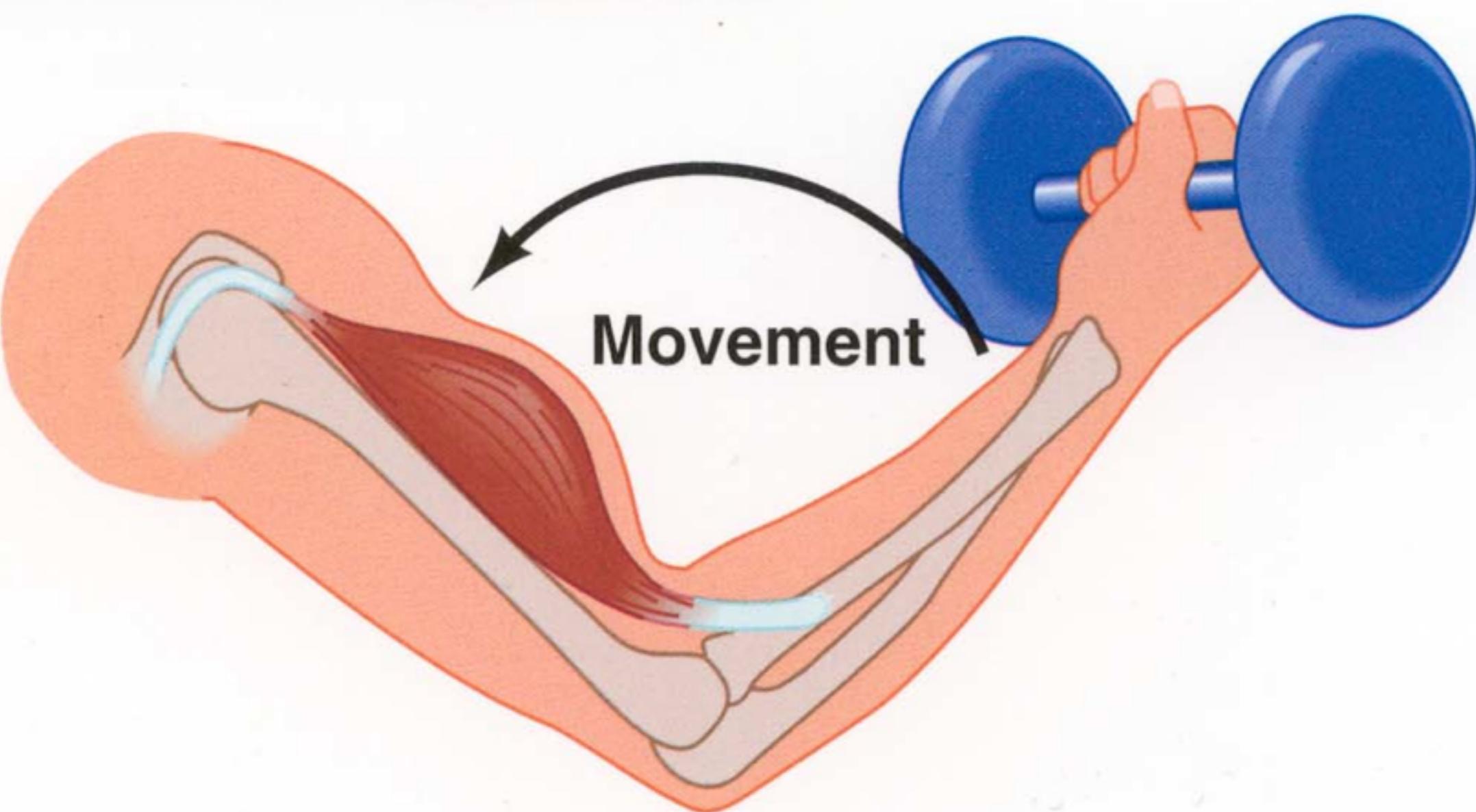
The best things in life are for free





NO MOVEMENT

## Concentric contraction

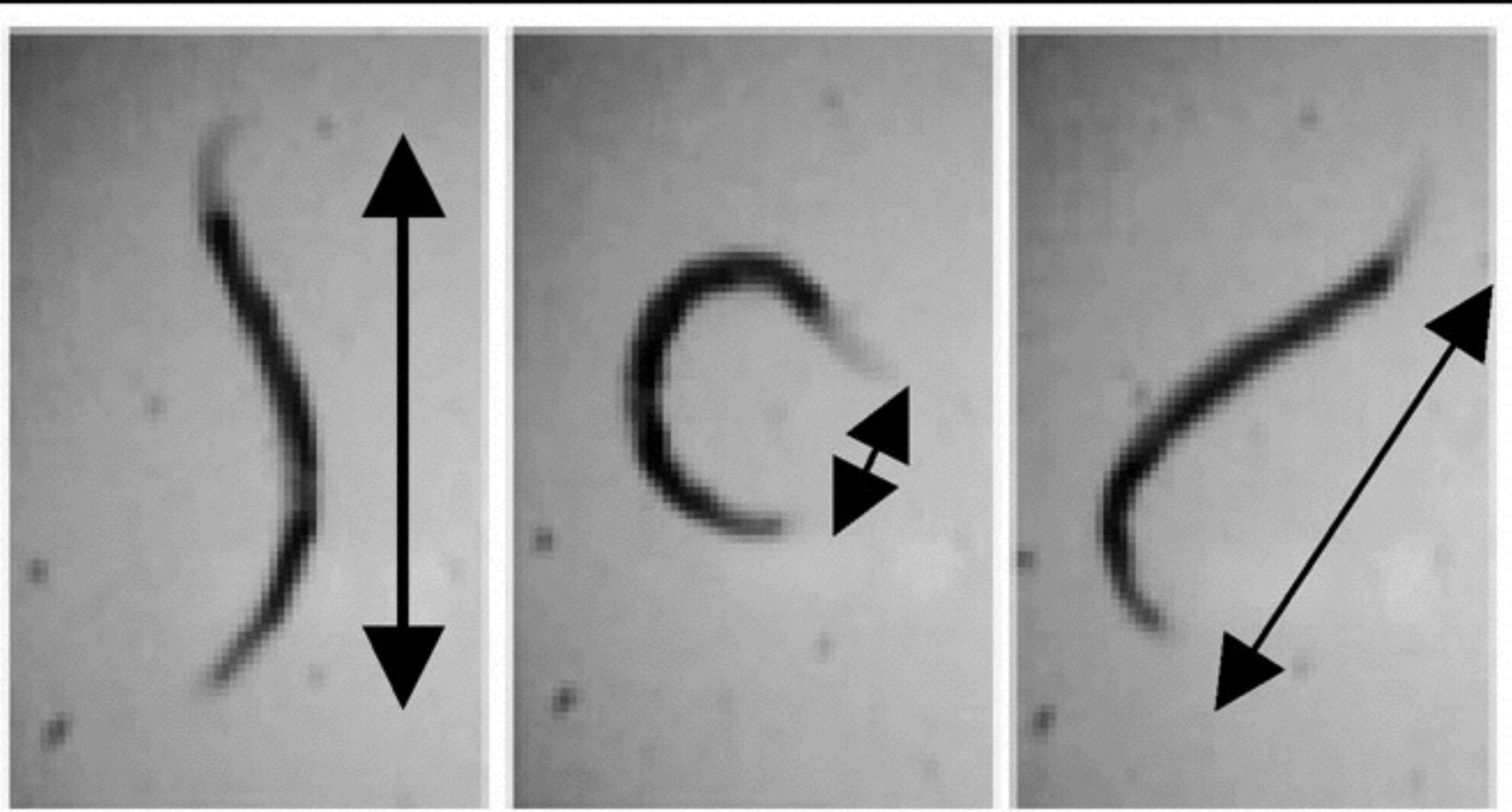


(a)

(b)

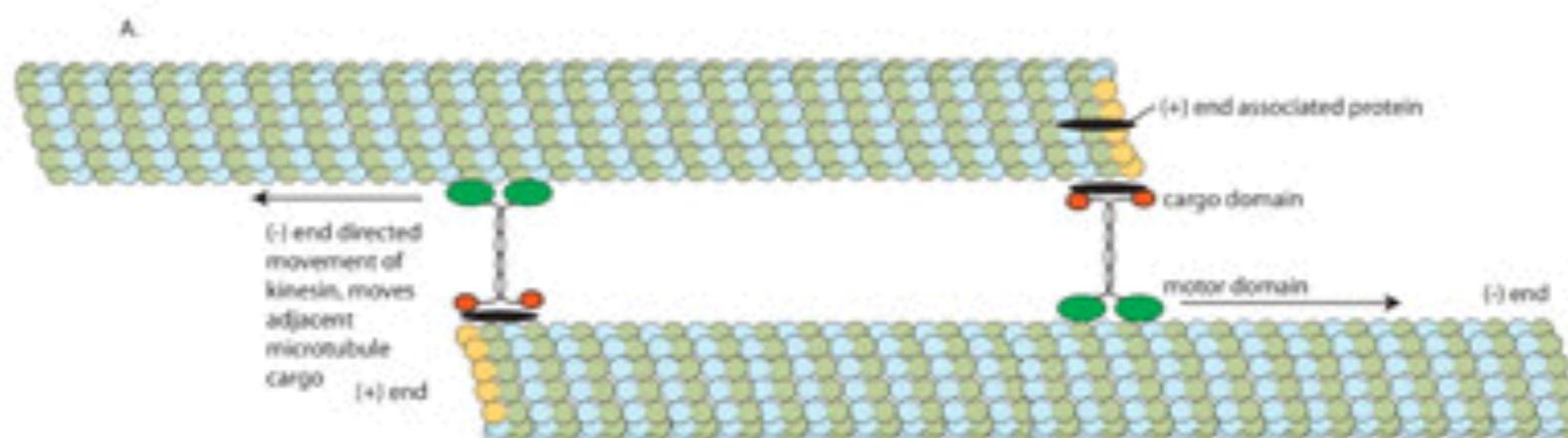


# C Elegans

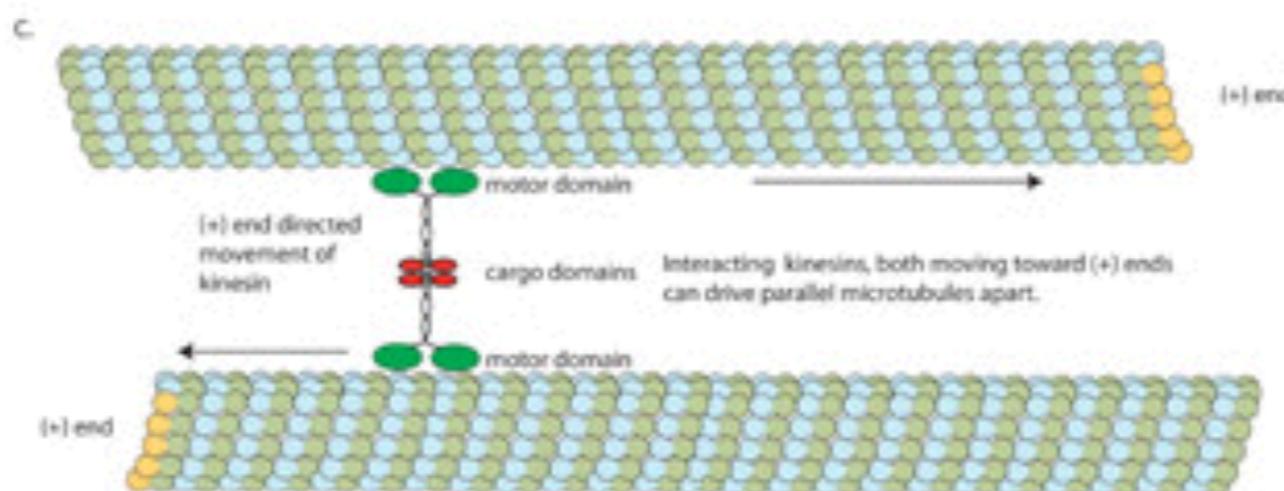
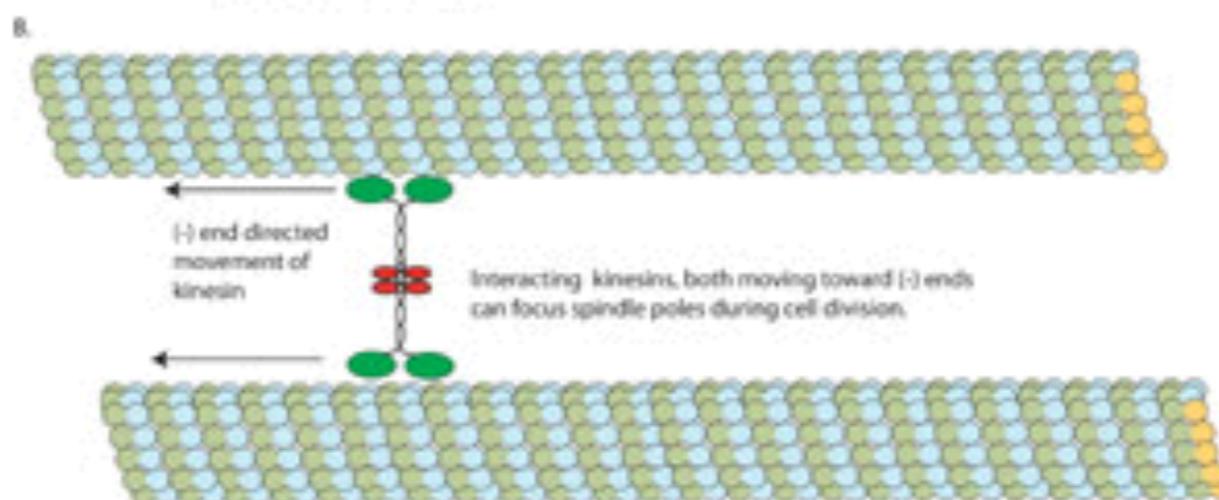




# Microtubule movement

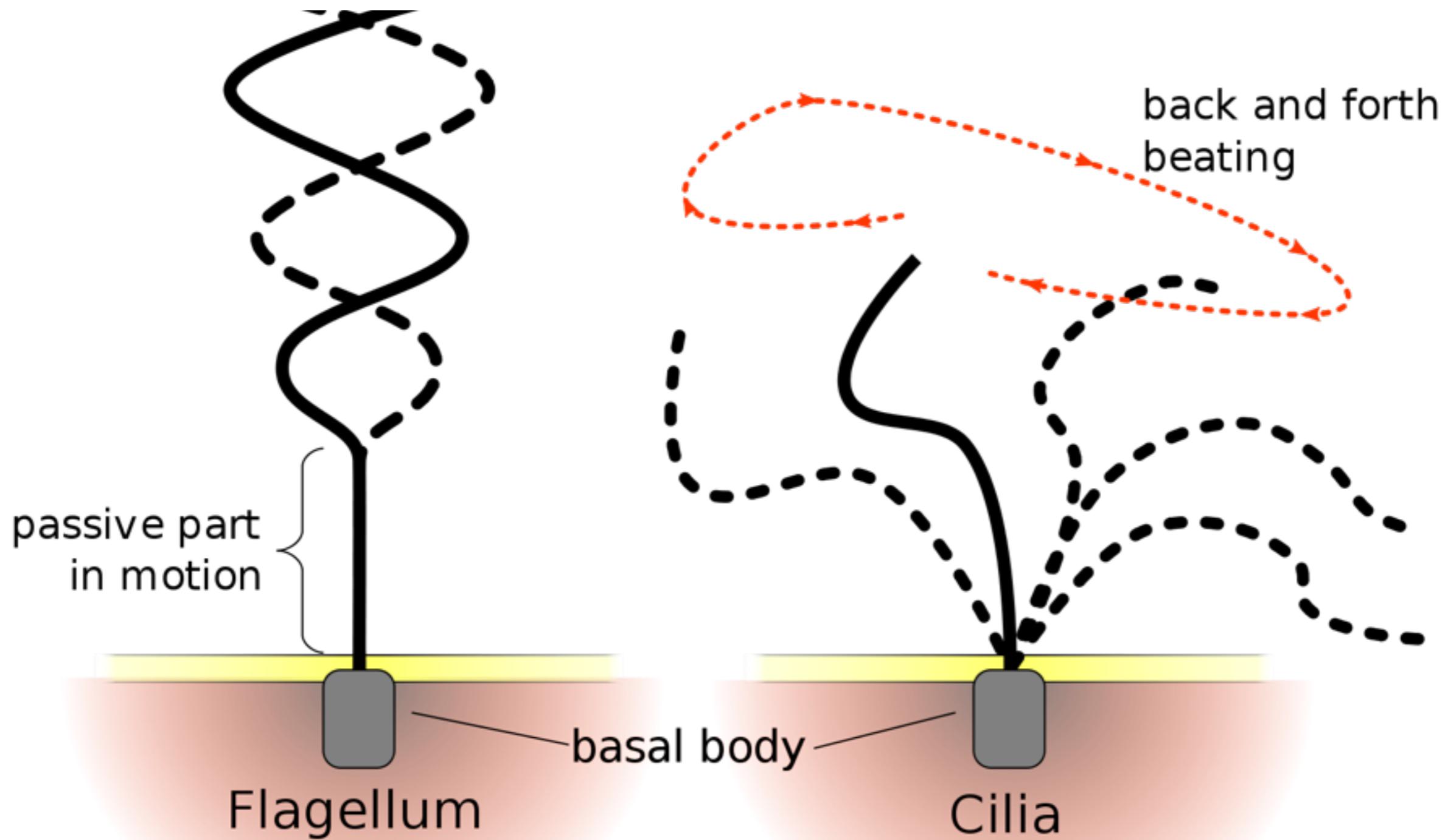


Mutual sliding of microtubules caused by (-) end-directed kinesins, increasing overlap between two parallel microtubules.





# Flagella



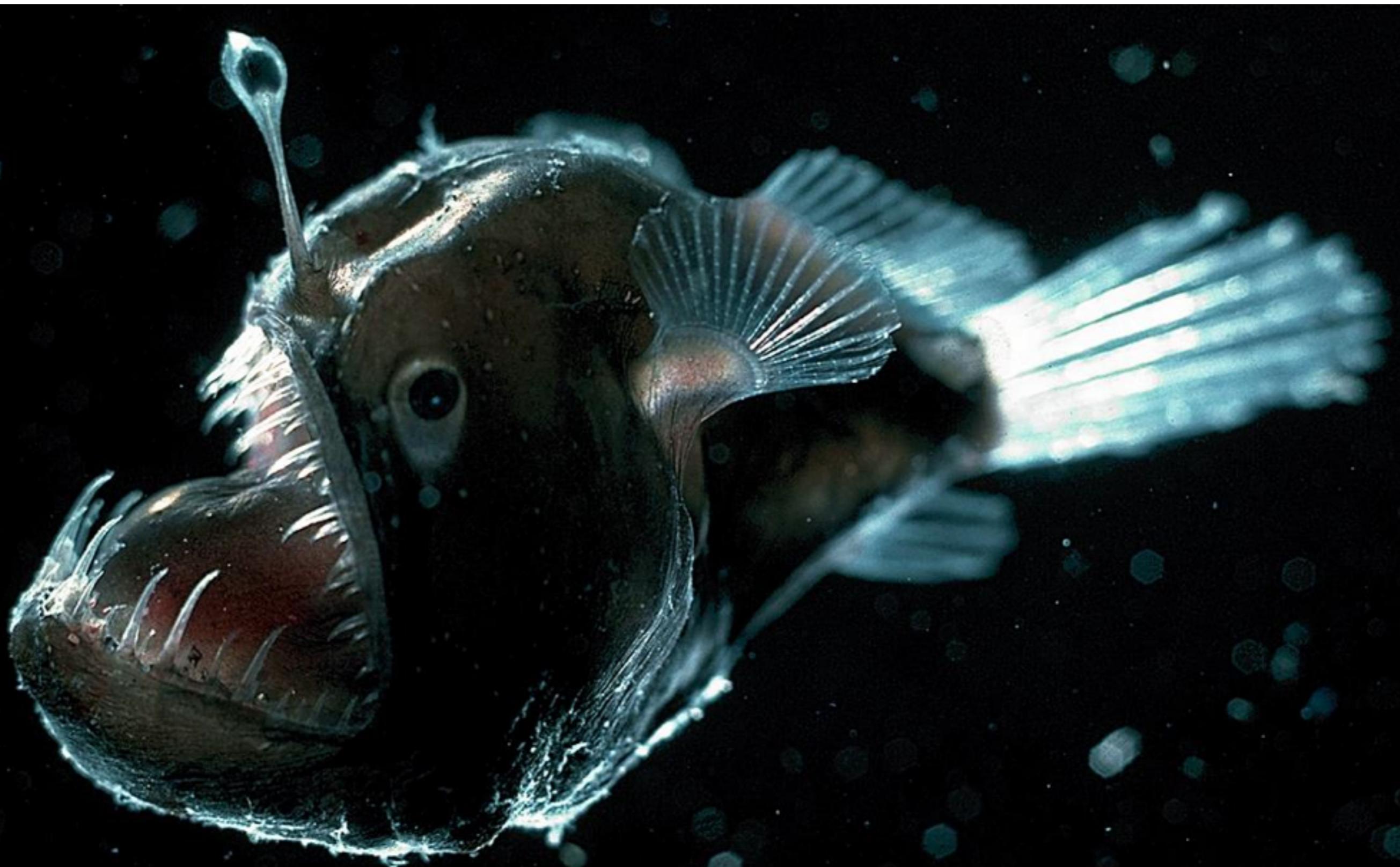


# 6: Salamander tongue





# 5: Angerfish suction





# 4: Mantis Shrimp shockwave



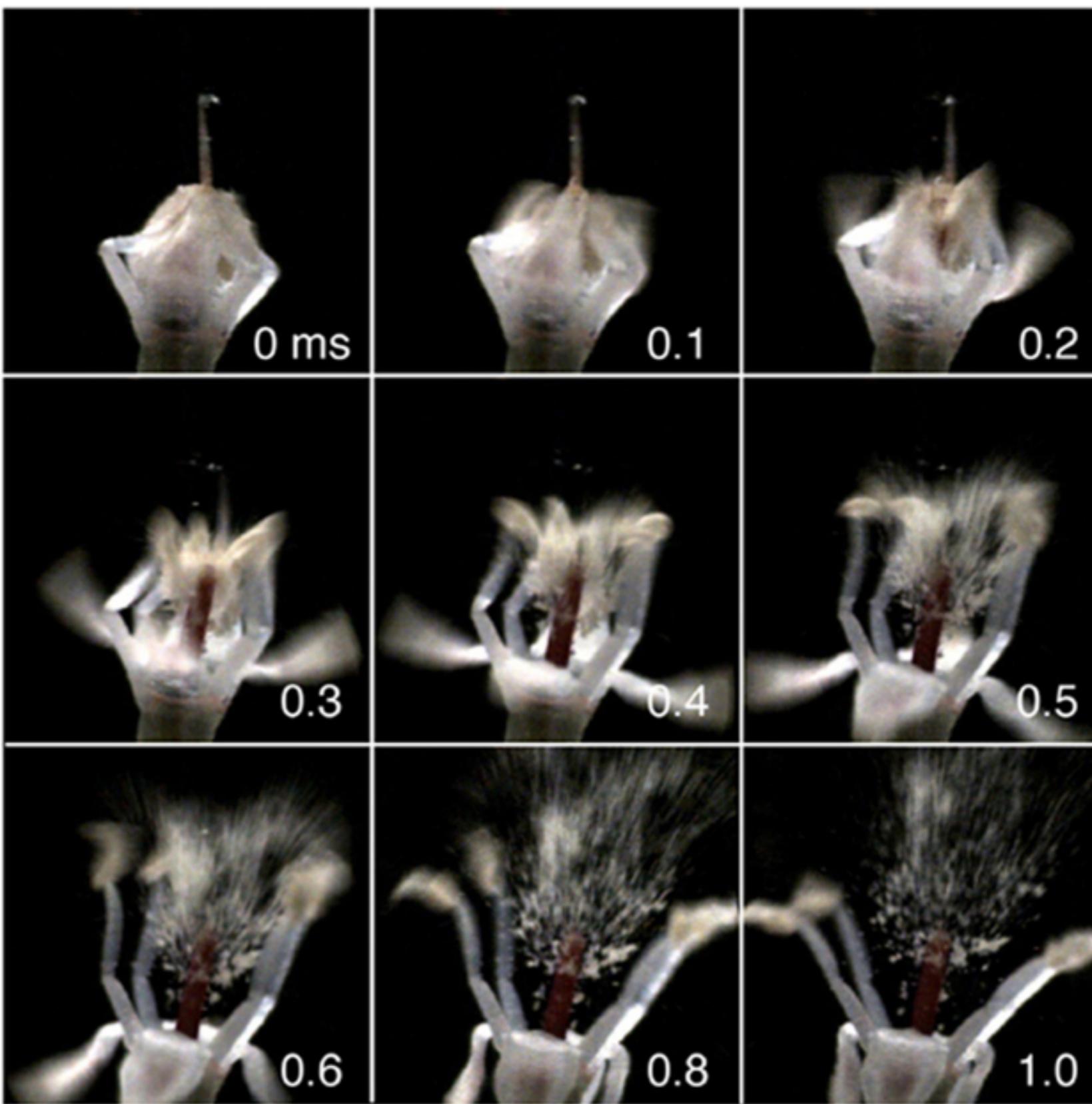


### 3: Trapdoor stomach Bladderwort



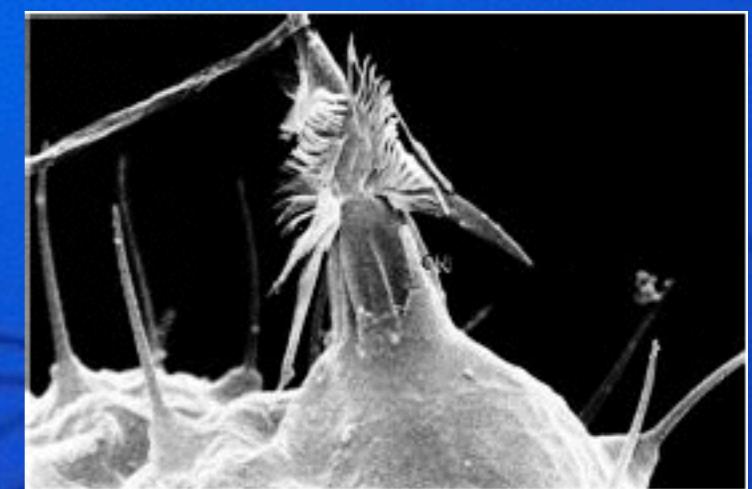


## 2: Pollen cannon





# 1: Jellyfish stingers





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# Documentation

& Graduation



# Graduation Board

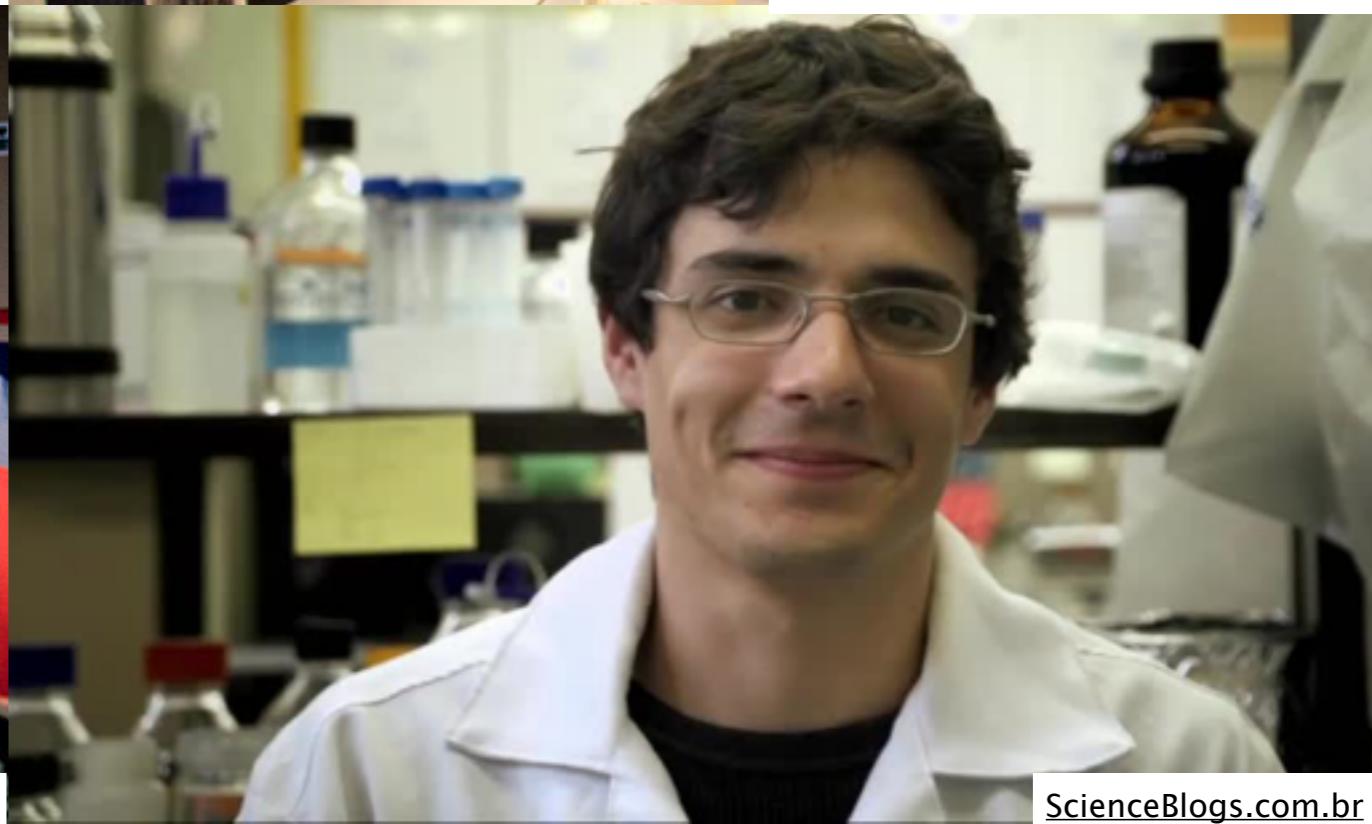
Rudiger Trojok  
Cathal Garvey  
Otto Heringer



PICNIC Network – Jonne Seijdel – CC-BY-SA 2.0



Medical Museion – CC-BY-SA-NC 2.0



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# Assignments

Weekly assignments to focus efforts:

1. Set up your own documentation site on Github;
2. Publish a microscopy video;
3. Design a personal laboratory tool;
4. Search for similar projects within the Biohack community;
5. Start sketching your bioreactor controller;
6. Design your bioreactor dimensions and fluxes;
7. Hack the spectrometer into a flow spectrometer;



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