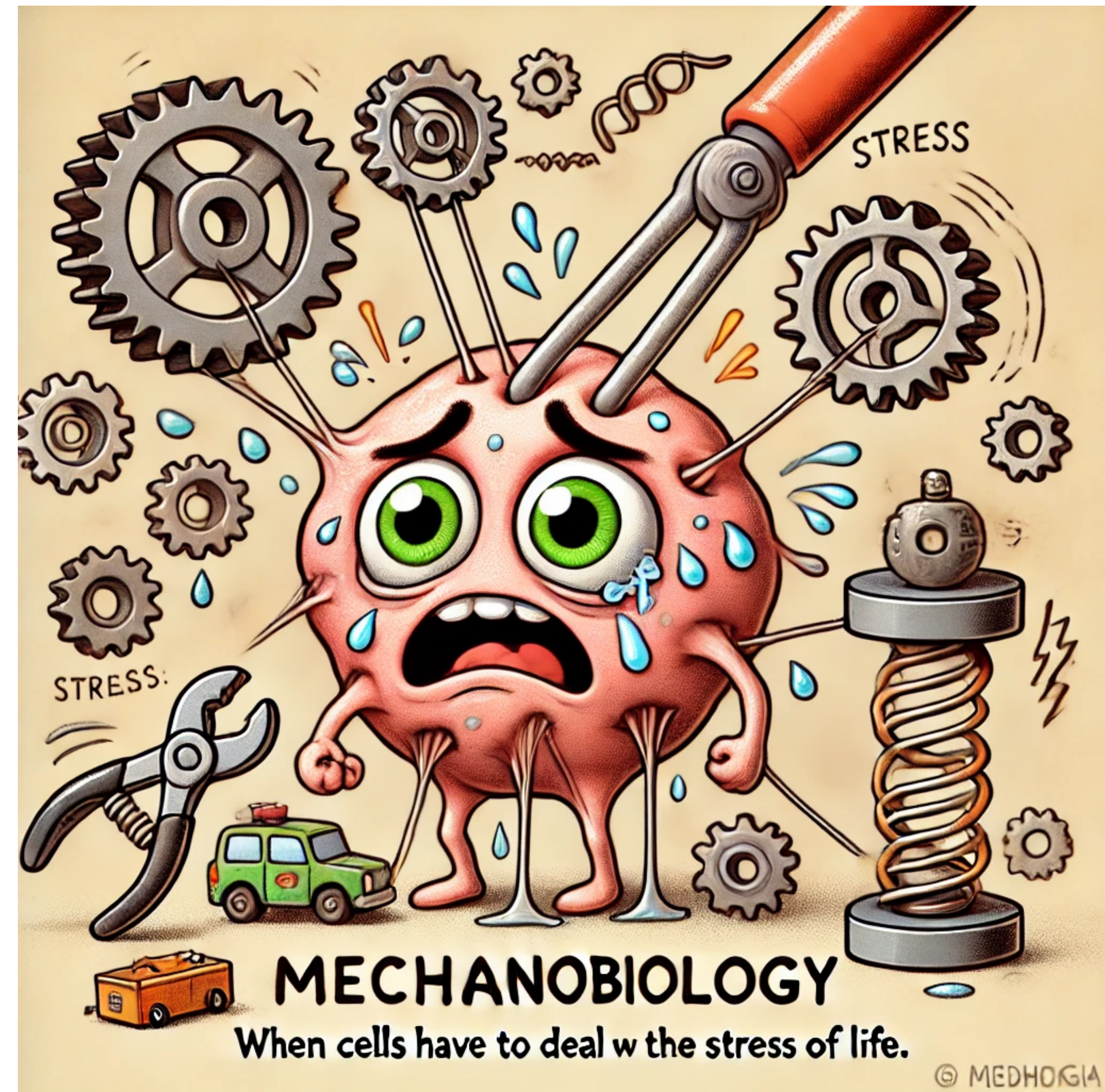


# Mechanobiology

ME-480 Lecture 1



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ChatGPT 4o

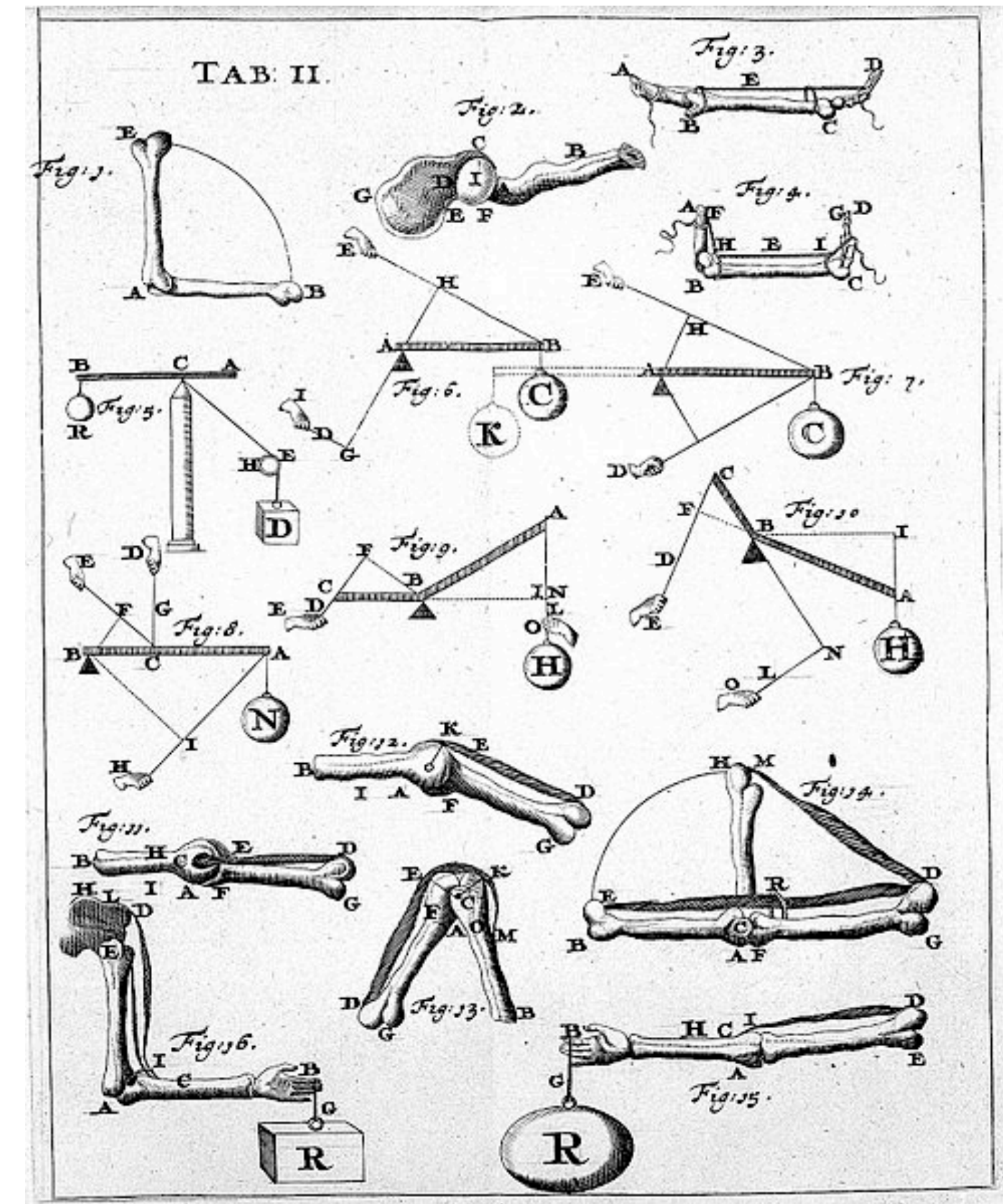
# Forces in biology



# Biomechanics

Biomechanics is as old as mechanics

- Aristotle
  - Da Vinci
  - Galileo, Copernicus
  - Descartes
  - Borelli...
- ➔ Laws of mechanics can be applied to living organisms: structure, motion.



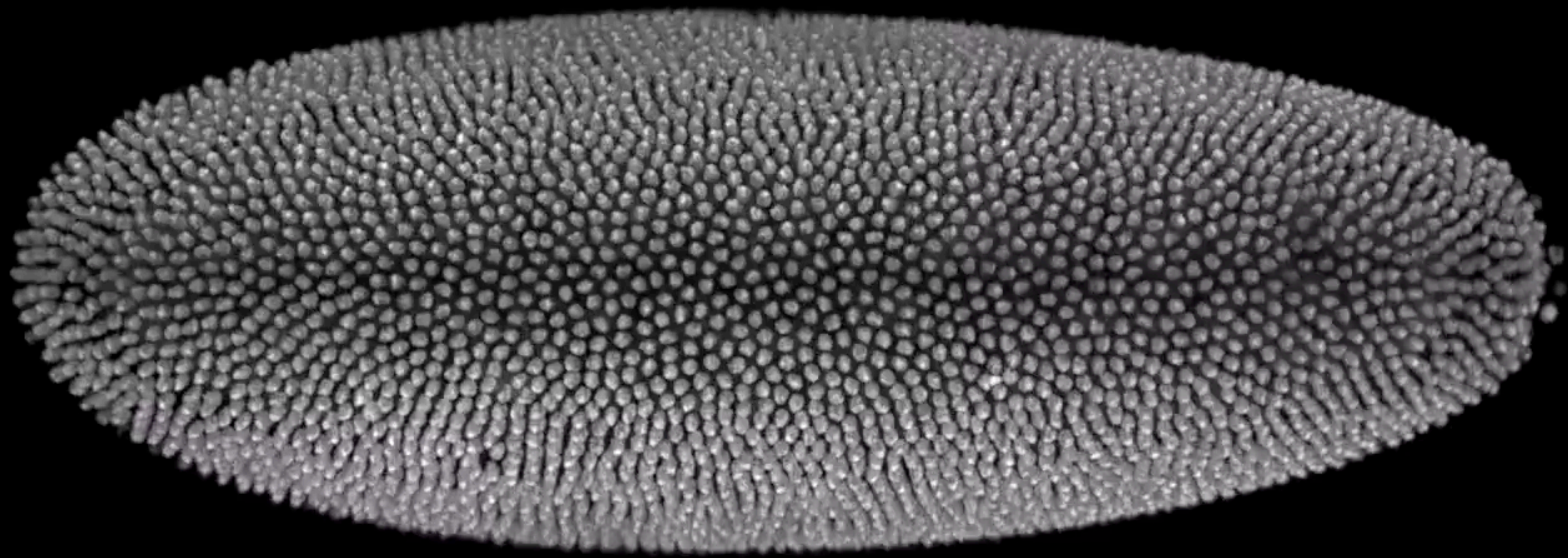
Borelli, De motu animalium, 1685

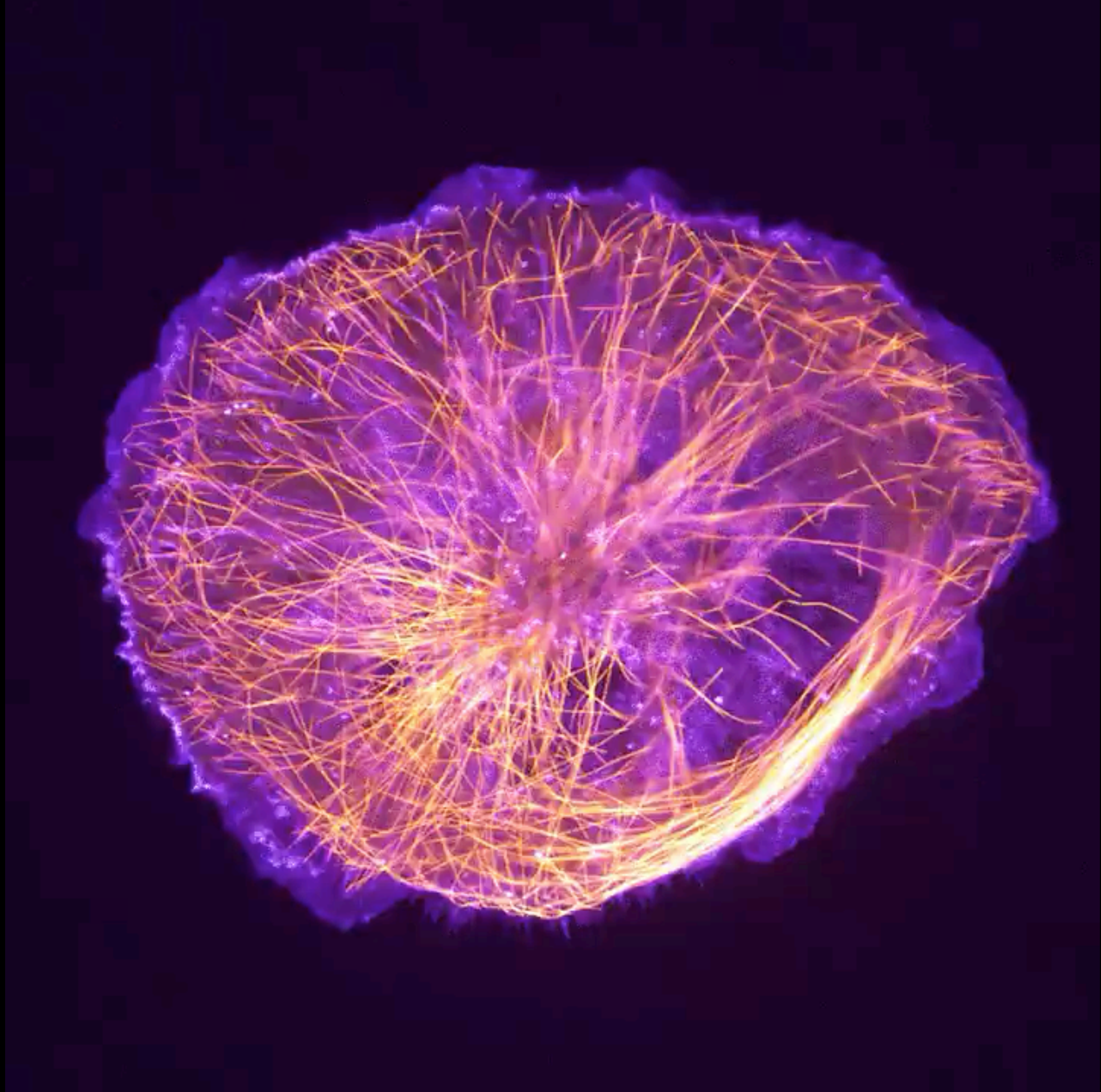
# What is mechanobiology?



**Biomechanics**

**Mechanobiology**





# Mechanobiology in hearing

transduction of mechanical input into biological response

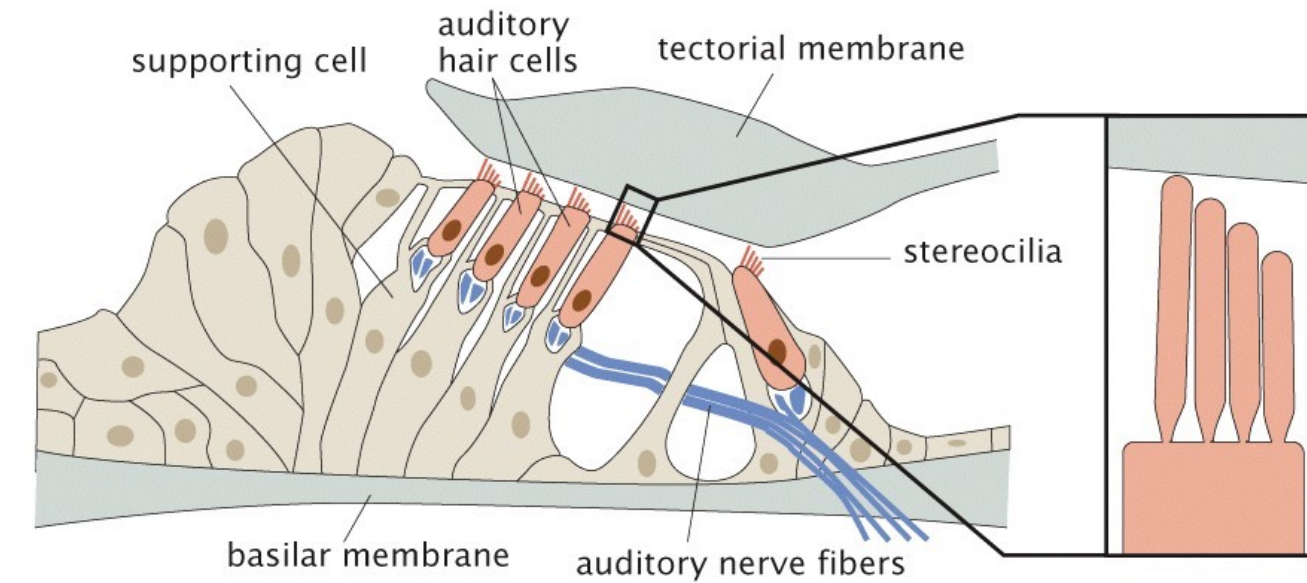
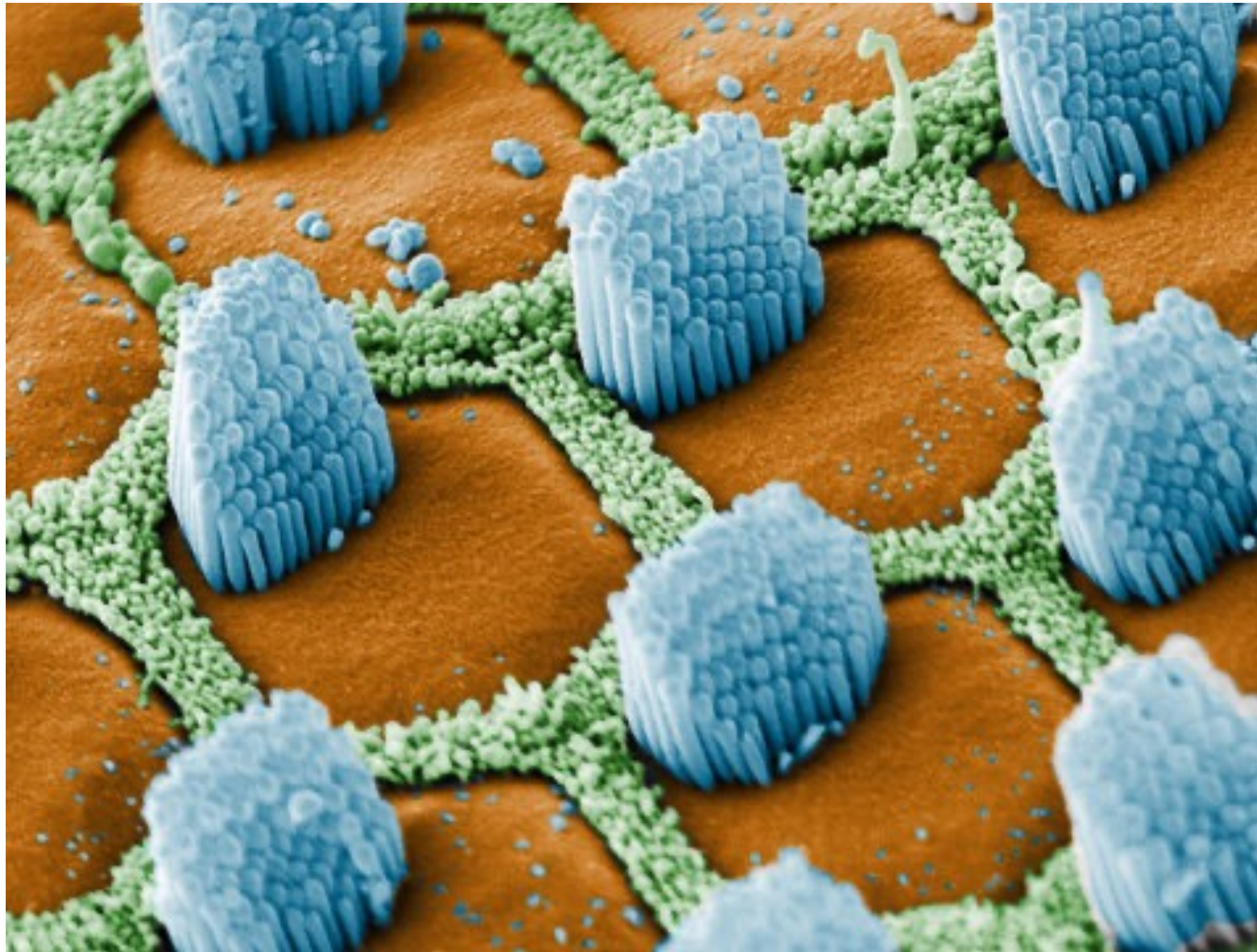
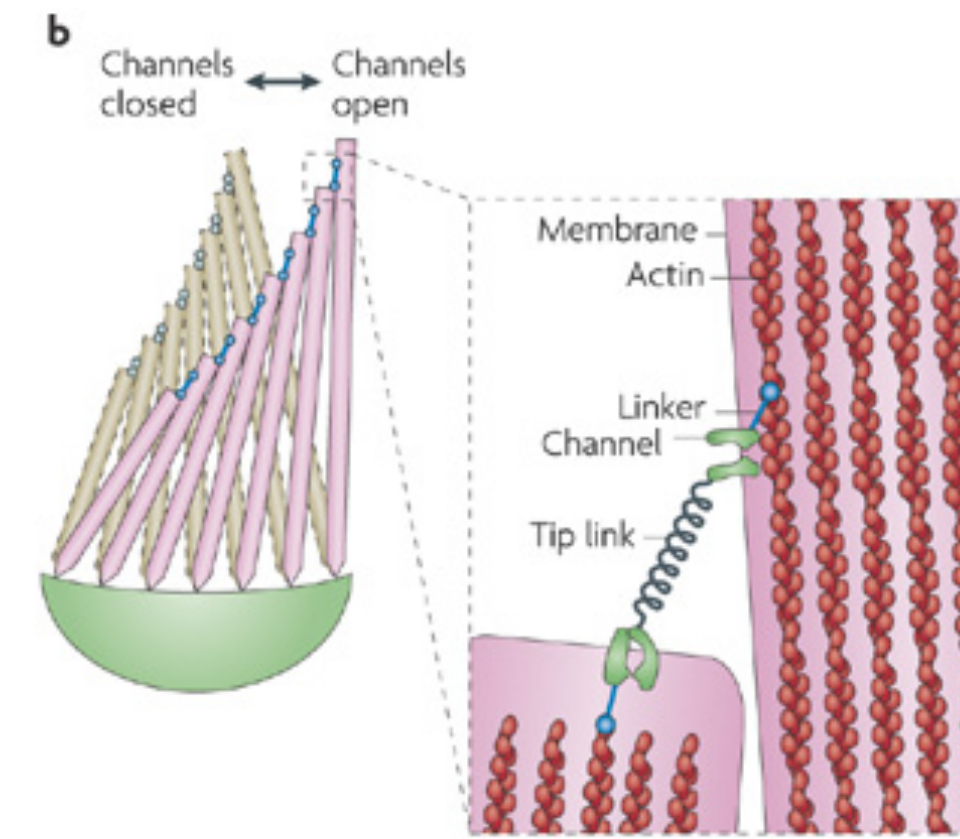
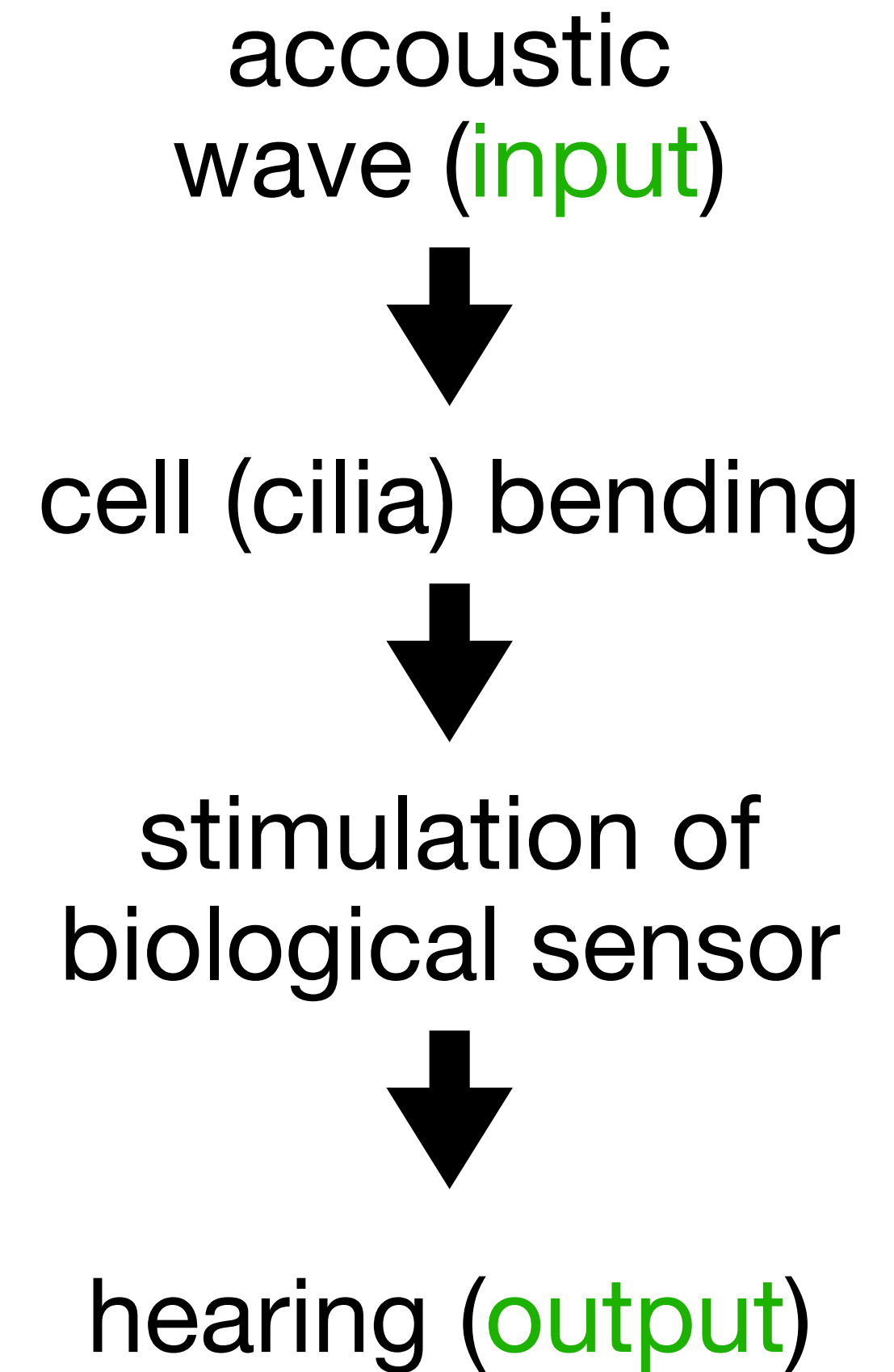


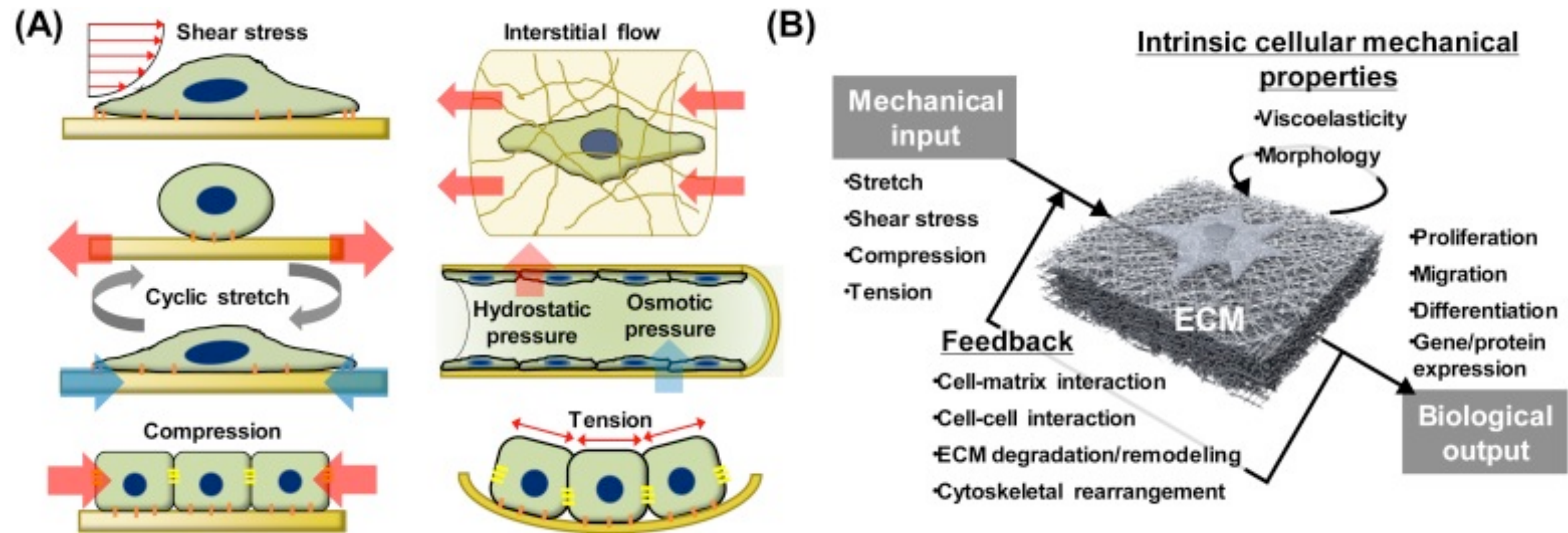
Figure 10.32 Physical Biology of the Cell, 2ed. (© Garland Science 2013)



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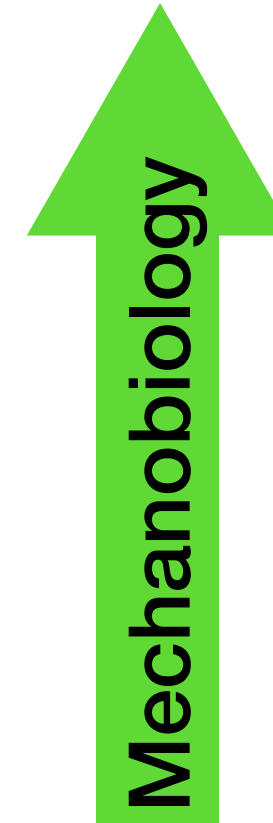
# Mechanotransduction regulates cell physiology





# Mechanobiology

## Biology



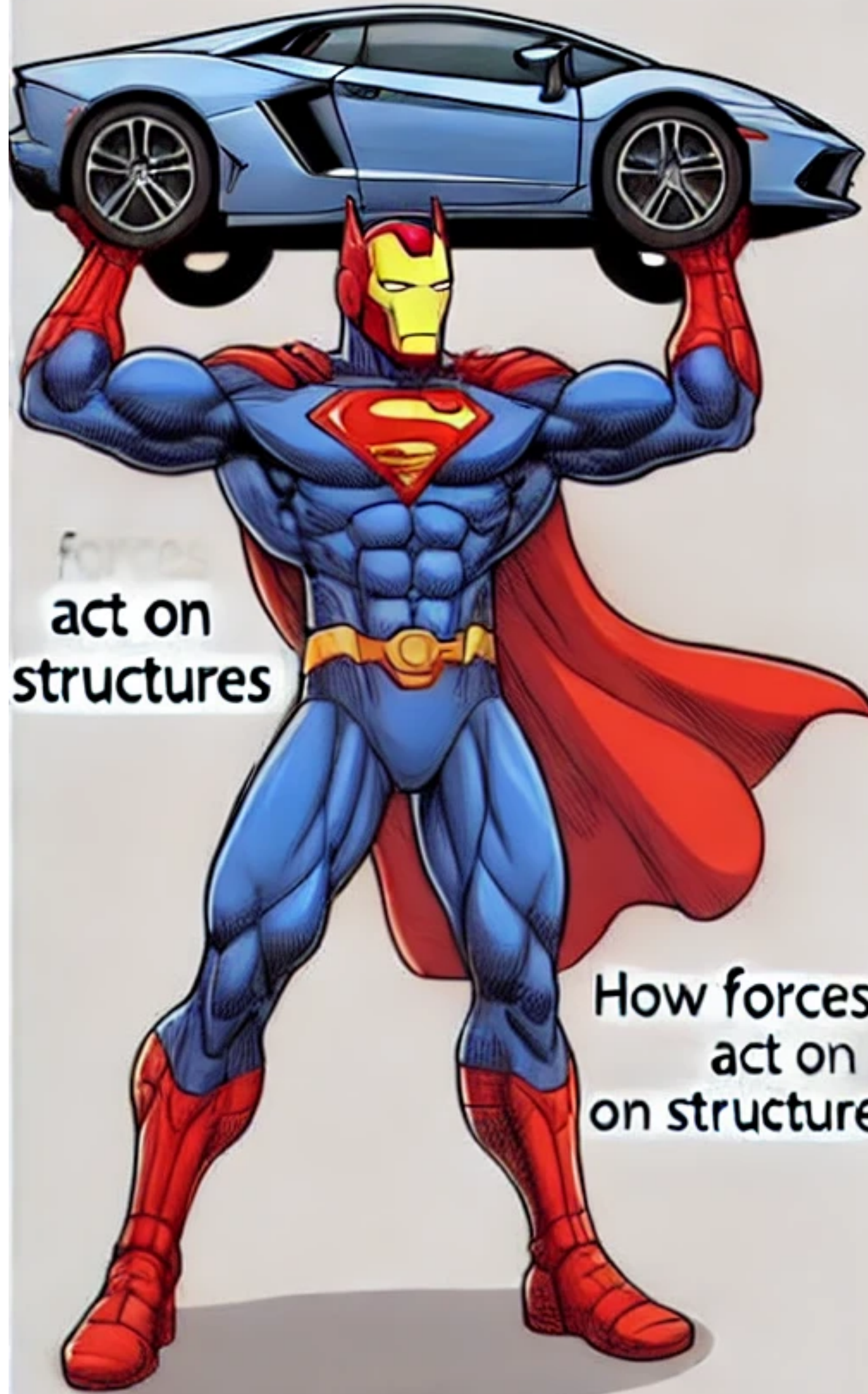
## Mechanics

**How mechanical processes regulate the physiology of a living system**

# BIOMECHANICS vs. MECHANBIOLOGY

How forces act on structures

How cells act on structures



forces  
act on  
structures

How forces  
act on  
structures

Same forces, ~~wfoent~~ different postures



How cells  
when stressed

stressed

Same forces, different problems