



Biophysics

Fourth lecture

Load bearing in biology

Second stage

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1- Load bearing in biology

1-1 Stress and Strain

Physically, stress is the force acting on a unit area.

Strain it is a measure of how much material is deformed as a result of the stress it has been exposed to.

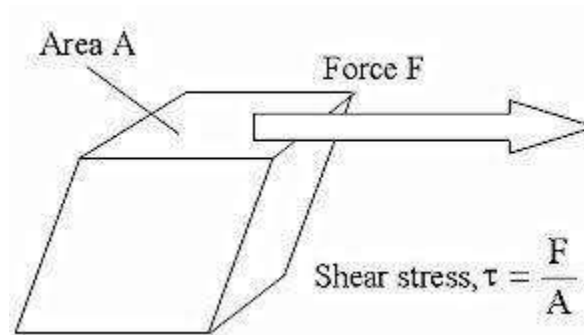
The most elemental of the load-bearing responses is Hooke's law, which relates stress and strain. While these terms are often used interchangeably in everyday language, they have specific definitions in biophysics. The stress σ is

$$\sigma = \frac{F}{A} \dots \dots \dots (4-1)$$

Where

F: is the force on the tissue.

A: is its cross-sectional area perpendicular to the applied force.



Stress is therefore defined in units of pressure. Strain ϵ is a fractional length change of a tissue:

$$\epsilon = \frac{\Delta l}{l} \dots \dots \dots (4-2)$$

Where

l : is the initial length of the tissue