

3 types of muscles

| | |
|-------------------------|---------------------------------------|
| Smooth muscles | around organs, involuntary movement |
| Cardiac muscles | hard to fatigue, special kind of cell |
| Skeletal muscles | attached to skeleton |

4 main functions skeletal muscles

- movement
- joint stabilization
- body temperature (shivering)
- protection of soft tissue

Muscle parts

The **belly** of the muscle can contract and is connected to the **tendons**, which are in turn connected to the bones. When a muscle is two-headed, it means that it is connected by tendons on two different points.

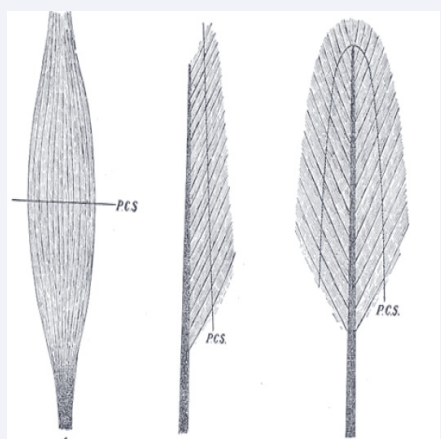
Muscles spanning joints

- **monoarticular** = spans one joint
- **biarticular** = spans two joints
- **polyarticular** = spans more joints. EX: foot

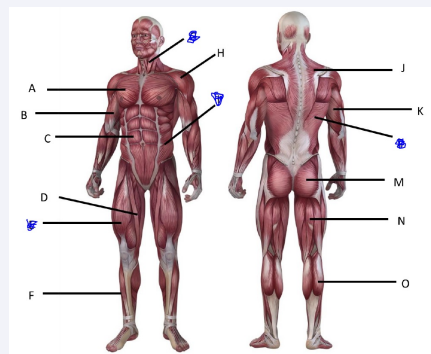
Muscle fibers

There are two different fibers in the muscle, the **actin filaments**, and the **myosine filaments**, that have cross bridges that make them able to connect and slide over de actin.

Parallel/penate muscles



Skeletal muscles



Functions skeletal muscles

| | |
|----------|------------------------------|
| A | adduction & anteflexion arms |
| B | flexion & supination elbow |
| C | flexion torso |
| E | Extension knee |
| F | Dorsal flexion |
| H | abduction arms |
| J (top) | elevation shoulder girdle |
| (middle) | retraction shoulder girdle |
| (lower) | depression shoulder girdle |
| K | Extension elbow |
| M | Extension hip |
| N | Flexion knee |
| O | Plantar flexion |

Motor unit

Consists of a motor neuron and the part of the muscle it controls. The motor neuron starts in the spinal cord. The more motor units you have, the better you can control your muscles.

Parallel/penate muscles

Parallel muscles can produce a bigger range of motion as the muscle fibers are much longer. Pennate muscles are much stronger because they have short but many muscle fibers.

3 kinds of muscle contractures

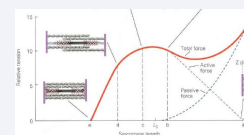
Names skeletal muscles

| | |
|---------------------|----------------------------------|
| A Pectoralis Major | (major chest muscle) |
| B Biceps | (ceps=head, so twoheaded muscle) |
| C Rectus Abdominus | (straight muscle in belly) |
| E Quadriceps | (fourheaded muscle) |
| F Tibialis Anterior | (front of tibia/scheenbeen) |
| H Deltoïdeus | |
| J Trapezius | (Diamant shape) |
| K Triceps | |
| M Gluteus Maximus | (biggest muscle of butt) |
| N Hamstrings | |
| O Triceps sureae | (threeheaded muscle lower leg) |

Connective tissue

The tendon is connective tissue that connects muscle fibers through the whole muscle but extends to the bone. When training, you increase the amount of muscle fibers.

Passive vs active force



The tension in the muscles are relative to the stretch of the muscles. Active forces get weaker when the muscle is stretched more (because filaments can't use their full force anymore), and passive forces go up when the muscles are stretched to prevent excessive movement.

4 kinds of equilibrium

| | |
|--------------|--|
| Stable | Always slowly returns to equilibrium, EX: spring |
| Unstable | Does not return to equilibrium |
| Indifferent | Is not affected by anything |
| Close-packed | Movement of one joint means that another joint needs to change to keep equilibrium |

Parallel muscle runs from tendon to tendon, penate muscles have a central tendon with muscle fibers attached to that (ex: hamstrings, triceps)

Difference is: penate muscles can produce more force, because the amount of muscle fibers is much bigger

| | |
|-----------|---|
| Eccentric | Active, muscle is lengthening while under load. |
|-----------|---|

| | |
|------------|---|
| Concentric | Active, muscle is shortening under load |
|------------|---|

| | |
|-----------|--|
| Isometric | Active, muscle contracts but does not shorten or lengthen under load |
|-----------|--|



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