

Muscular system

General myology

Active part of locomotor system

App. 600 muscles (1/3 of weight, ♂ 35%, ♀ 32%)

Sensitive system (position of body)

Thermoregulation

Blood and lymphatic circulation

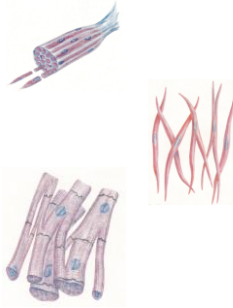
Verbal and nonverbal communication

Logistic system (breathing, food intake)

Muscle tissue

Muscle tissue is characterized by the ability to contract when stimulated.

1. Skeletal muscle: long, multinucleate cells with visible striations, voluntary muscle
2. Smooth muscle: short, cylindrical cells, involuntary muscle; e.g. digestive tract, walls of blood vessels
3. Cardiac (heart) muscle: short, branched, striated cells, with one nucleus at the center of each cell, joined to their neighbors by intercalated discs, involuntary muscle

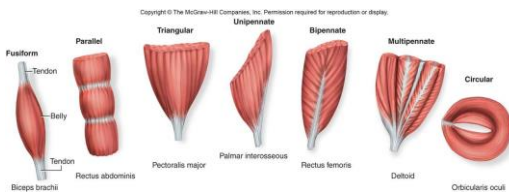


Chak, 2001

Composition of skeletal muscles



Types of muscles according to shape



<http://www.studyblue.com/notes/note/n/ch-10-11-muscle-tissue/deck/81728>

Types of muscles according to function

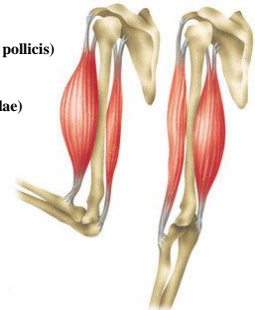
antagonists x synergists

flexors x extensors
(m. biceps brachii x m. triceps brachii)

abductors x adductors
(m. abductor pollicis brevis x m. adductor pollicis)

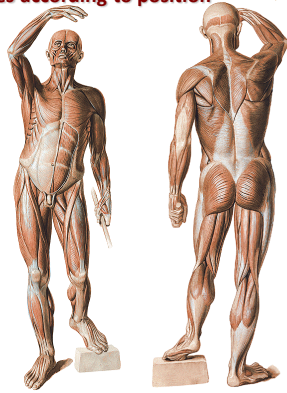
dilatators x sfincters
(m. dilatator pupillae x m. sphincter pupillae)

supinators x pronators
(m. supinator x m. pronator teres)

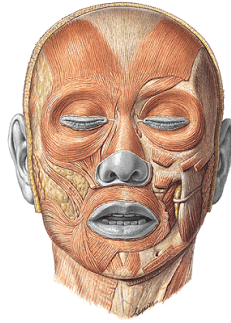


Types of muscles according to position

- Head muscles
- Cervical muscles
- Thoracic muscles
- Abdominal muscles
- Muscles of the pelvic floor
- Dorsal muscles
- Upper extremity muscles
- Muscles of the lower extremity



Head muscles (*mm. capitis*)

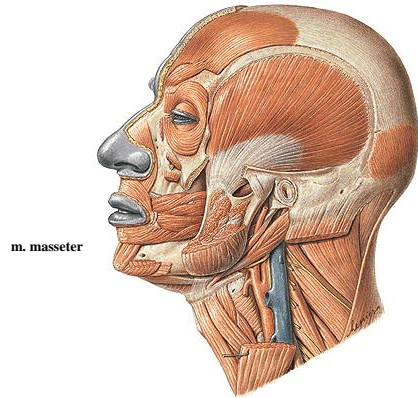
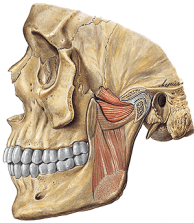
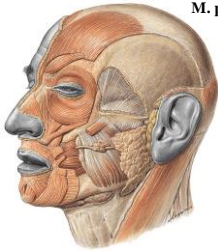


Masticatory muscles (*mm. masticatorii*)

Muscles of facial expression (*mm. faciales*)

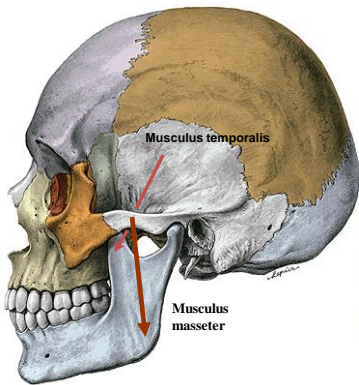
Masticatory muscles (*mm. masticatorii*)

- M. temporalis
- M. masseter
- M. pterygoideus medialis
- M. pterygoideus lateralis



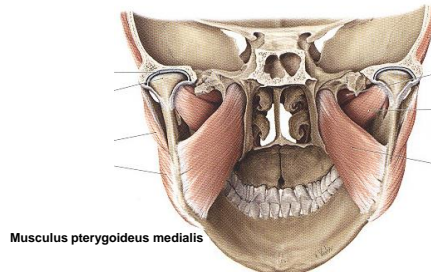
m. masseter

m. temporalis



Musculus temporalis

Musculus masseter



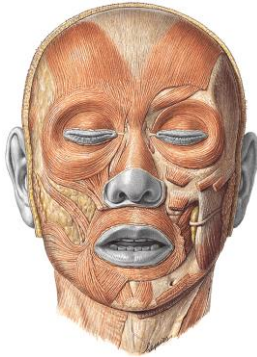
Musculus pterygoideus medialis

Musculus pterygoideus lateralis

Muscles of facial expression (*musculi faciales*)

Skin muscles without fascia

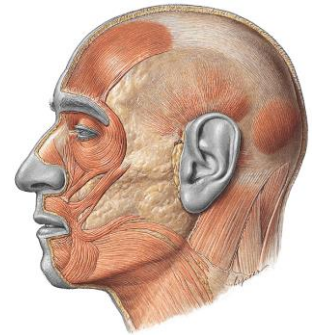
- Mm. epicranii*
- Muscles of palpebral fissure
- Muscles of the mouth
- Muscles of the nose



Musculi epicranii

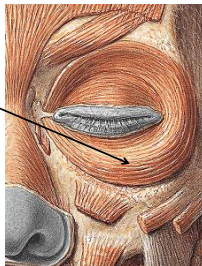
Musculus occipitofrontalis

Musculus temporoparietalis

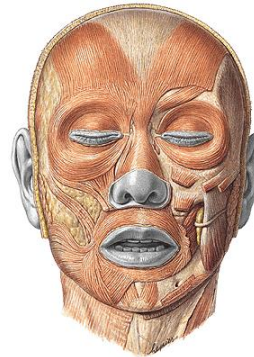


Muscles of palpebral fissure

Musculus orbicularis oculi



Muscles of the mouth



Musculus levator labii sup.

Musculus orbicularis oris

Musculus depressor labii inferioris

Musculus depressor anguli oris

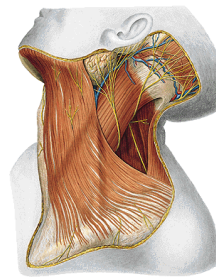
Muscles of the nose

Musculus nasalis

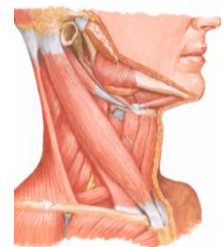


Cervical muscles

Musculus platysma



Musculus sternocleidomastoideus

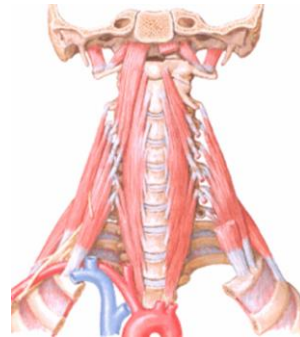
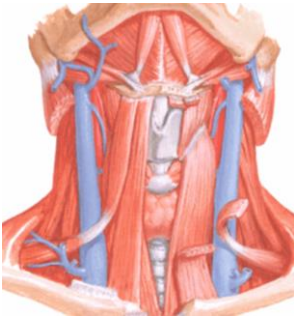


Suprahyoid muscles

- M. digastricus
- M. mylohyoideus
- M. geniohyoideus
- M. stylohyoideus

Infrahyoid muscles

- M. sternohyoideus
- M. sternothyroideus
- M. thyrohyoideus
- M. omohyoideus



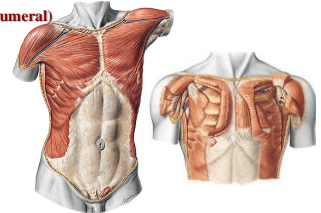
- Musculus scalenus anterior
- Musculus scalenus medius
- Musculus scalenus posterior
- Musculus longus colli
- Musculus longus capitis

Thoracic muscles

Thoracic muscles

Heterochthonous muscles (thoraco-humeral)

- Musculus pectoralis major
- Musculus pectoralis minor
- Musculus serratus anterior



Autochthonous muscles

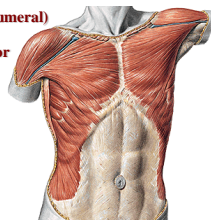
- Musculi intercostales externi, interni et intimi

Diaphragm

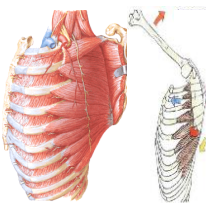


Heterochthonous muscles (thoraco-humeral)

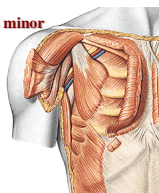
- Musculus pectoralis major



Musculus serratus anterior



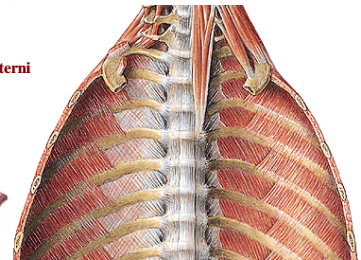
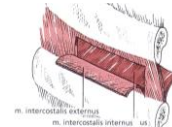
- Musculus pectoralis minor



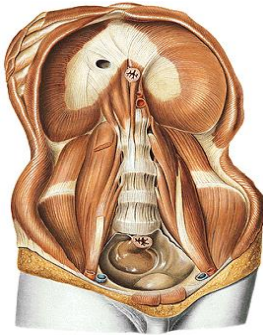
Autochthonous muscles

- Musculi intercostales externi

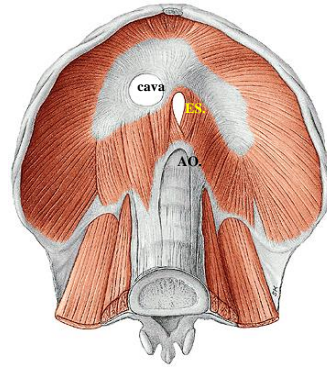
- Musculi intercostales interni



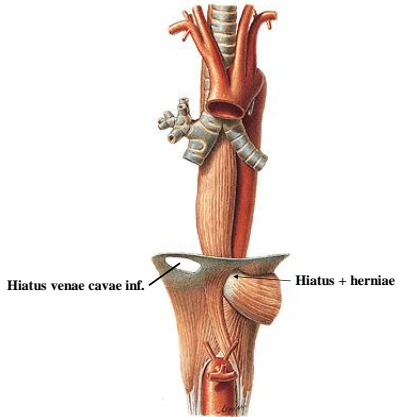
Diaphragm



- Centrum tendineum
- Vena cava inferior
- Esophagus
- Aorta abdominalis



Abdominal muscles



Hiatus venae caevae inf.

Hiatus + herniae

Anterior group

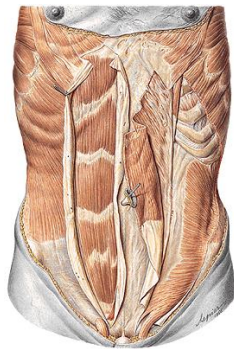
- musculus rectus abdominis
- musculus pyramidalis

Lateral group

- musculus obliquus externus abdominis
- musculus obliquus internus abdominis
- musculus transversus abdominis

Dorsal group

- musculus quadratus lumborum



Anterior group of abdominal muscles

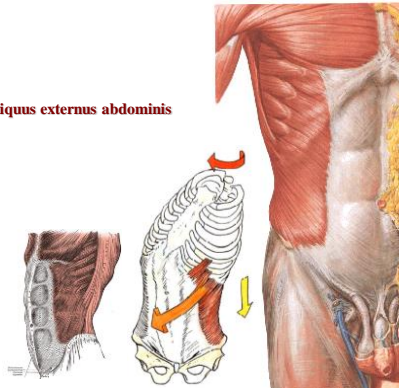
Musculus rectus abdominis

Musculus pyramidalis

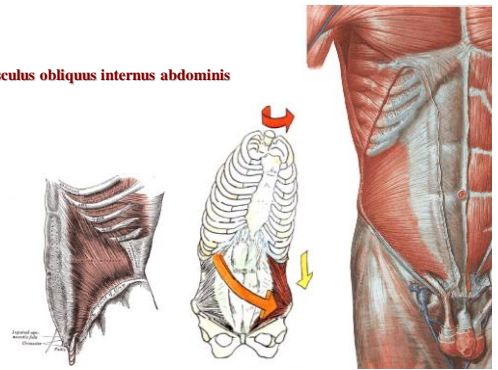


Lateral group of abdominal muscles

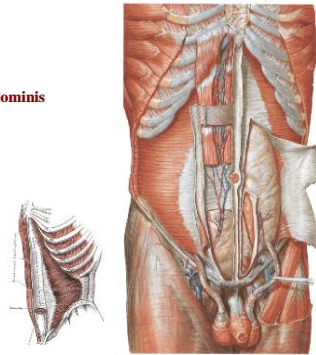
Musculus obliquus externus abdominis



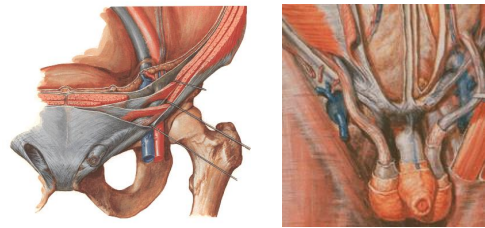
Musculus obliquus internus abdominis



Musculus transversus abdominis

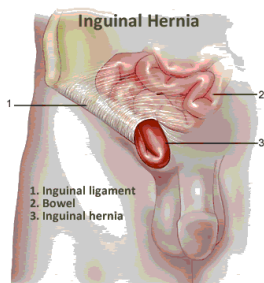


Inguinal canal



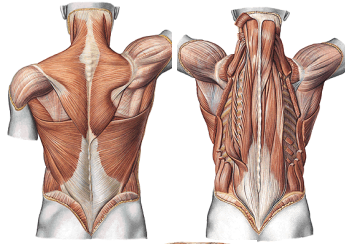
- Contents:**
♀ lig. teres uteri
♂ funiculus spermaticus

Dorsal muscles



Dorsal muscles

Heterochthonous muscles
 Spinohumeral muscles
 Spinocostal muscles



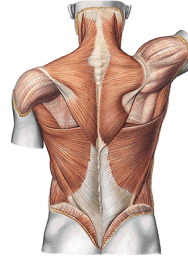
Autochthonous muscles
 Spinotransversal system
 Sakrospinal system
 Spinospinal system
 Transversospinal system

Short dorsal muscles
 Musculi nuchae profundi

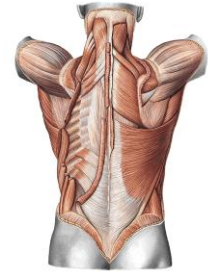


Spinohumeral muscles

Musculus latissimus dorsi
Musculus trapezius
Musculus levator scapulae



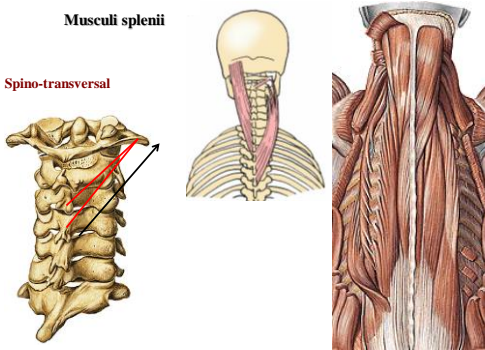
Musculus rhomboideus minor
Musculus rhomboideus major



Autochthonous muscles – spinotransversal system

Musculi splenii

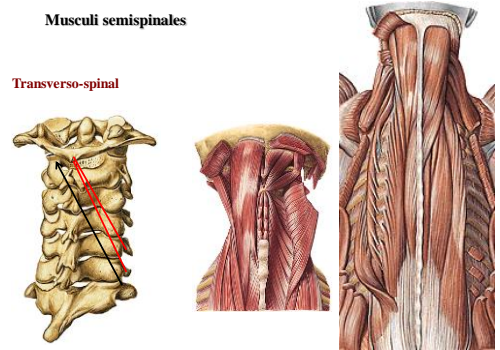
Spino-transversal



Autochthonous muscles – transverso-spinal system

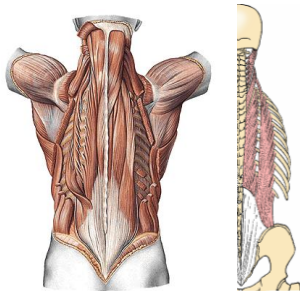
Musculi semispinales

Transverso-spinal



Sacro-spinal system

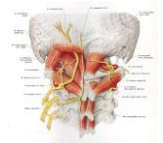
Musculus erector spinae



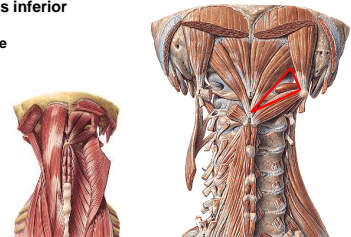
Short dorsal muscles

The deep nuchal muscles

- a) M. rectus capitis posterior minor
- b) M. rectus capitis posterior major
- c) M. obliquus capitis superior
- d) M. obliquus capitis inferior



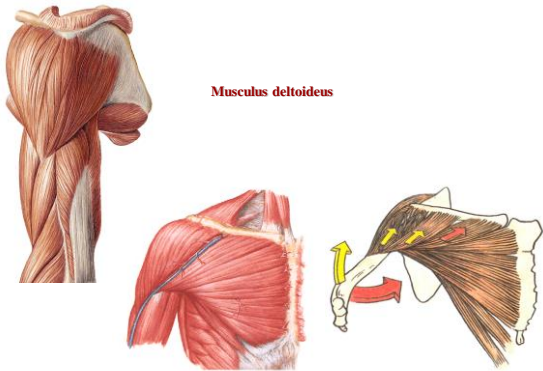
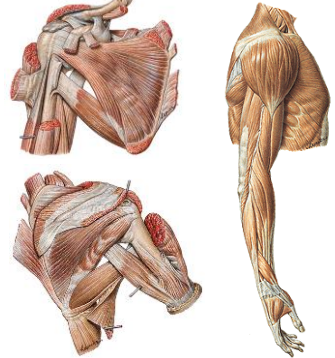
Trigonum suboccipitale



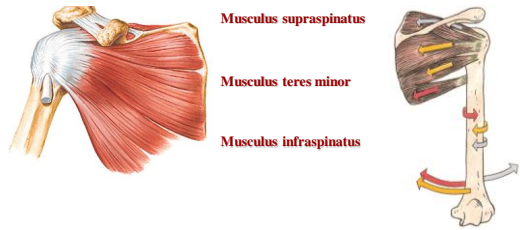
Upper extremity muscles

Shoulder muscles

- Musculus deltoideus
- Musculus supraspinatus
- Musculus infraspinatus
- Musculus teres minor
- Musculus teres major
- Musculus subscapularis



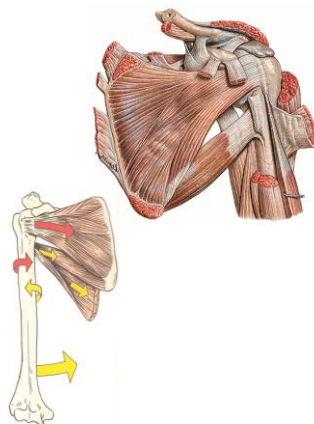
Musculus deltoideus



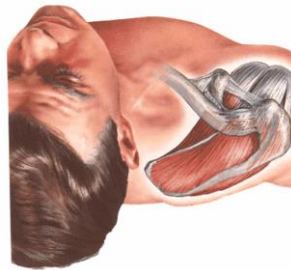
- Musculus supraspinatus
- Musculus teres minor
- Musculus infraspinatus

Musculus subscapularis

Musculus teres major



Rotator cuff

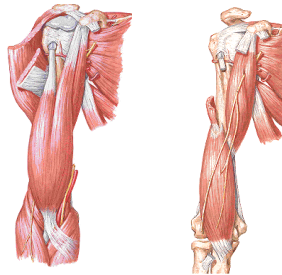


- Tendons of:**
- m. supraspinatus
 - m. infraspinatus
 - m. teres minor
 - m. subscapularis

Brachial muscles

Ventral group

- Musculus biceps brachii
- Musculus coracobrachialis
- Musculus brachialis

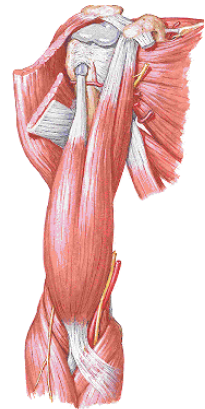


Dorsal group

- Musculus triceps brachii

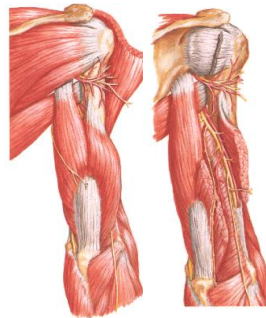
Musculus biceps brachii

- caput longum
- caput breve



Musculus triceps brachii

- caput longum
- caput mediale
- caput laterale



Antebrachial muscles – ventral group

Flexors of forearm and wrist

Composed of three layers – superficial, middle and deep

Superficial layer:

- Musculus pronator teres
- Musculus flexor carpi radialis

Middle layer:

- Musculus flexor digitorum superficialis

Deep layer:

- Musculus flexor digitorum profundus
- Musculus flexor pollicis longus



Carpal tunnel

Eminentia carpi radialis et ulnaris

Retinaculum flexorum (lig. carpi transversum)

Canalis carpi:

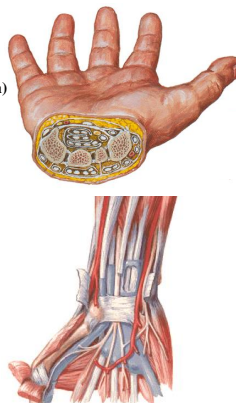
Radial part: m. flexor carpi radialis

Ulnar part: m. flexor digitorum superficialis

m. flexor digitorum profundus

m. flexor pollicis longus

nervus medianus



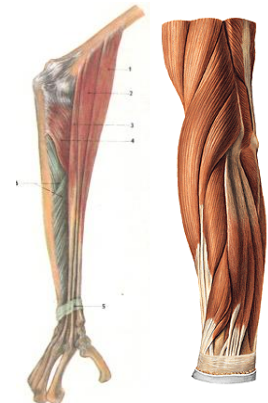
Lateral group of antebrachial muscles

Musculus brachioradialis

Musculus extensor carpi radialis longus

Musculus extensor carpi radialis brevis

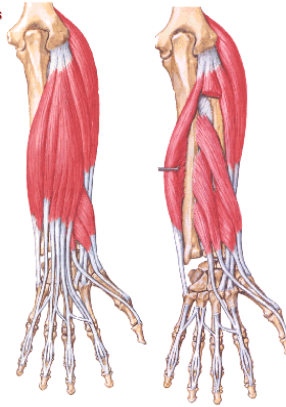
Musculus supinator



Dorsal group of antebrachial muscles

Extensors of fingers and wrist

- Musculus extensor digitorum
- Musculus extensor carpi ulnaris
- Musculus abductor pollicis longus
- Musculus extensor pollicis brevis
- Musculus extensor pollicis longus



Muscles of hand

Thenar muscles:

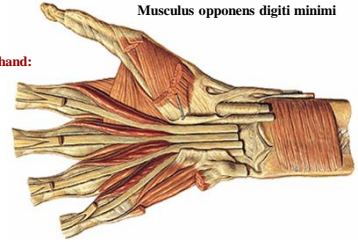
- Musculus abductor pollicis brevis
- Musculus flexor pollicis brevis
- Musculus opponens pollicis
- Musculus adductor pollicis

Hypothenar muscles:

- Musculus palmaris brevis
- Musculus abductor digiti minimi
- Musculus flexor digiti minimi
- Musculus opponens digiti minimi

Middle group of muscles of hand:

- Musculi interossei dorsales
- Musculi interossei palmares
- Musculi lumbricales

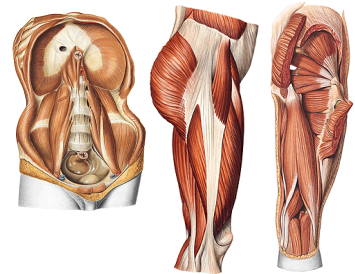


Muscles of lower extremity

Muscles of the hip

Anterior group: Musculus iliopsoas

- Posterior group:**
- Musculus gluteus maximus
- Musculus gluteus medius
- Musculus gluteus minimus
- Musculus piriformis



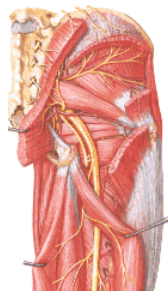
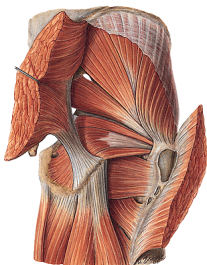
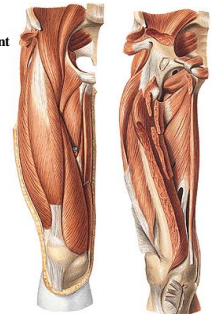
Foramen suprapiriforme et infrapiriforme

Anterior group of muscles of thigh

Flexors of the hip joint, extensors of the knee joint

Musculus quadriceps femoris

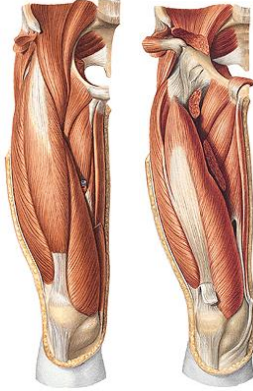
1. m. rectus femoris
 2. m. vastus medialis
 3. m. vastus lateralis
 4. m. vastus intermedius
- Musculus sartorius**



Medial group of muscles of thigh

Adductors of thigh

- Musculus gracilis
- Musculus pectineus
- Musculus adductor longus
- Musculus adductor brevis
- Musculus adductor magnus



Dorsal group of muscles of thigh

Extensors of the hip joint, flexors of the knee joint

- Musculus semitendinosus
- Musculus semimembranosus
- Musculus biceps femoris



Muscles of crus – anterior group

Extensors of toe, foot and fingers

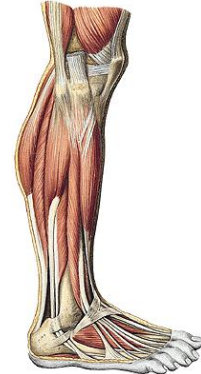
- Musculus tibialis anterior
- Musculus extensor hallucis longus
- Musculus extensor digitorum longus



Muscles of crus – lateral group

Flexors of foot

- Musculus fibularis (peroneus) longus
- Foot vault
- Musculus fibularis brevis



Muscles of crus – posterior group

Superficial layer:

- Musculus triceps surae

Deep layer:

- Musculus tibialis posterior
- Musculus flexor hallucis longus
- Musculus flexor digitorum longus

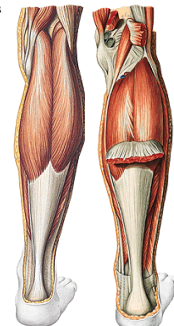


Musculus triceps surae

Composed of musculus gastrocnemius and musculus soleus

Tendo Achillis

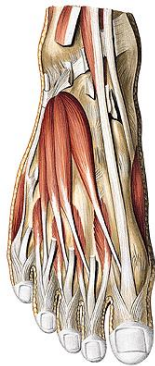
Flexor of foot



Muscles of foot-dorsal group

Musculus extensor hallucis brevis

Musculus extensor digitorum brevis

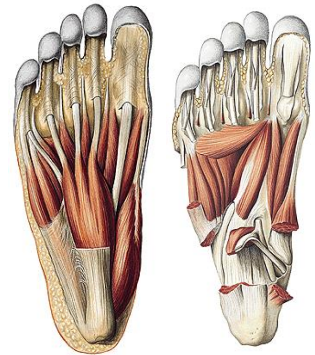


Muscles of toe

Musculus abductor hallucis

Musculus adductor hallucis

Musculus flexor hallucis brevis

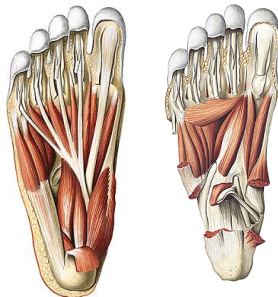


Muscles of fifth finger

Musculus abductor digiti minimi

Musculus opponens digiti minimi

Musculus flexor digiti minimi



Middle group of foot muscles

Musculus flexor digitorum brevis

Musculus quadratus plantae

Musculi interossei dorsales I. až IV.

Musculi interossei palmares I. až III.

Musculi lumbricales I. až IV.

