

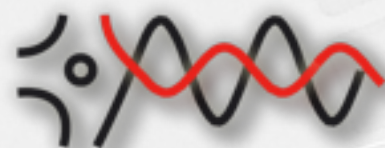
Physiologie

UE5

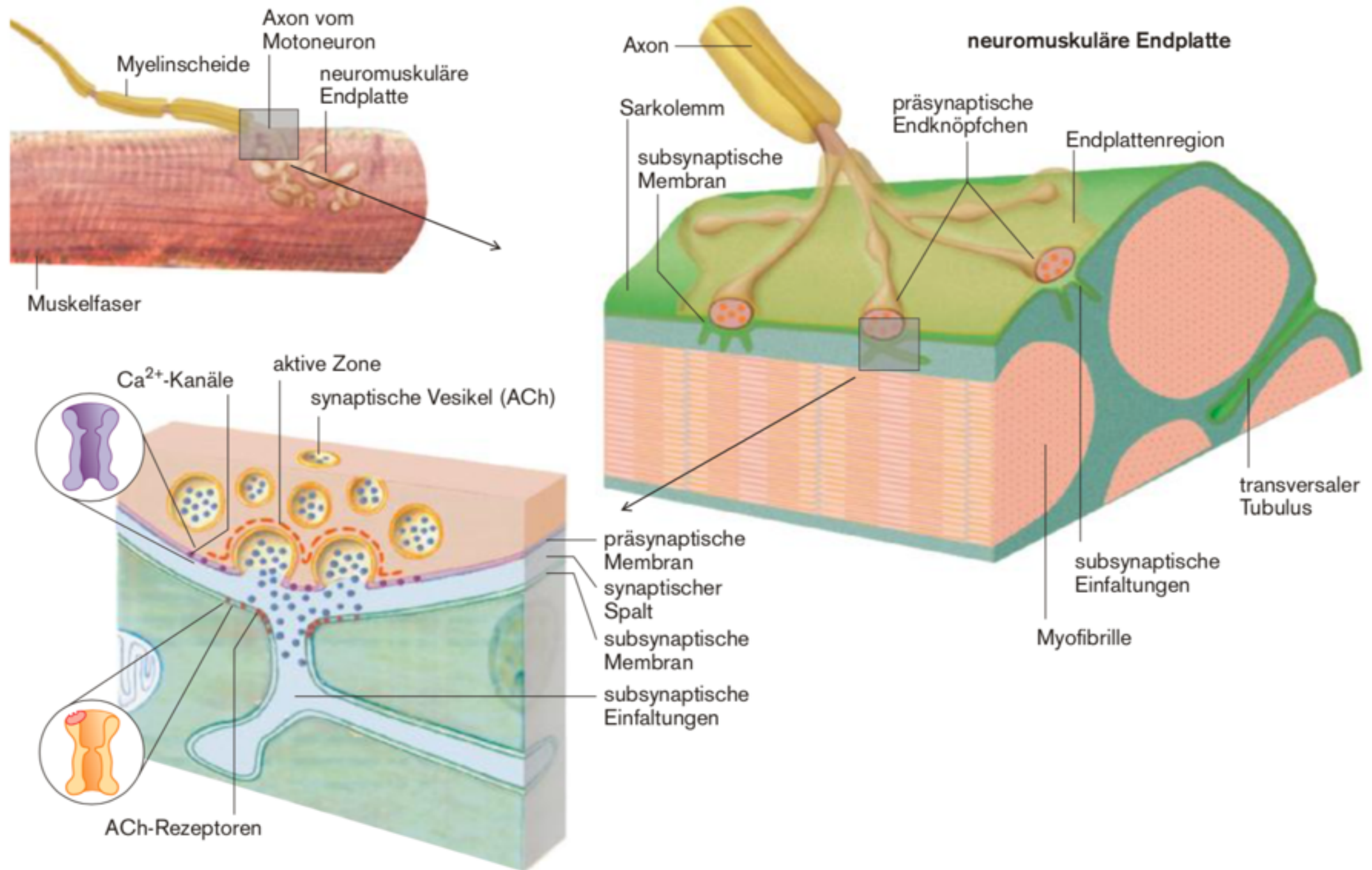
Motorik

Fred Wouters

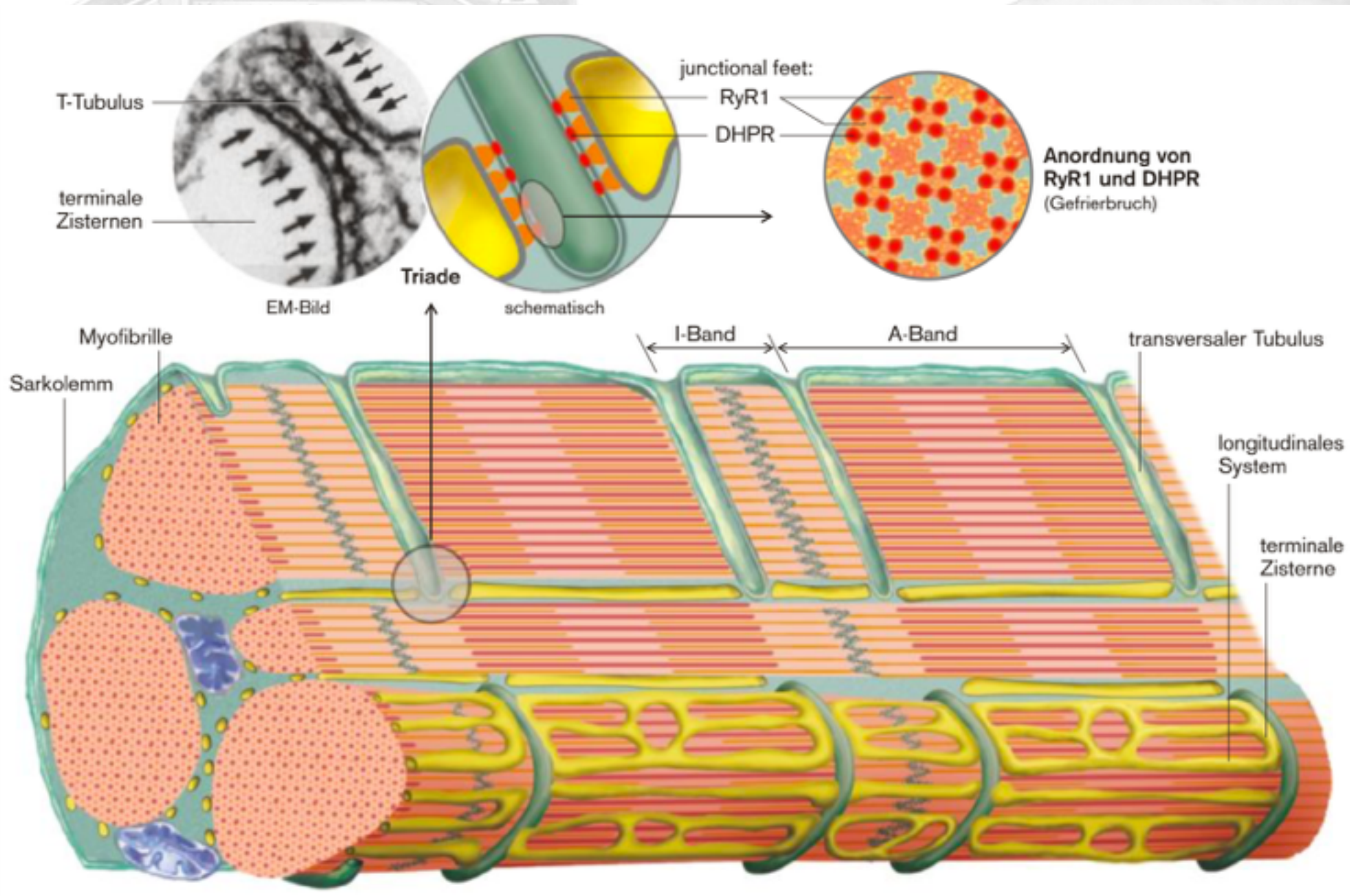
Molekulare & Zelluläre Systeme
Institut für Neuropathology
E-mail: fred.wouters@gwdg.de



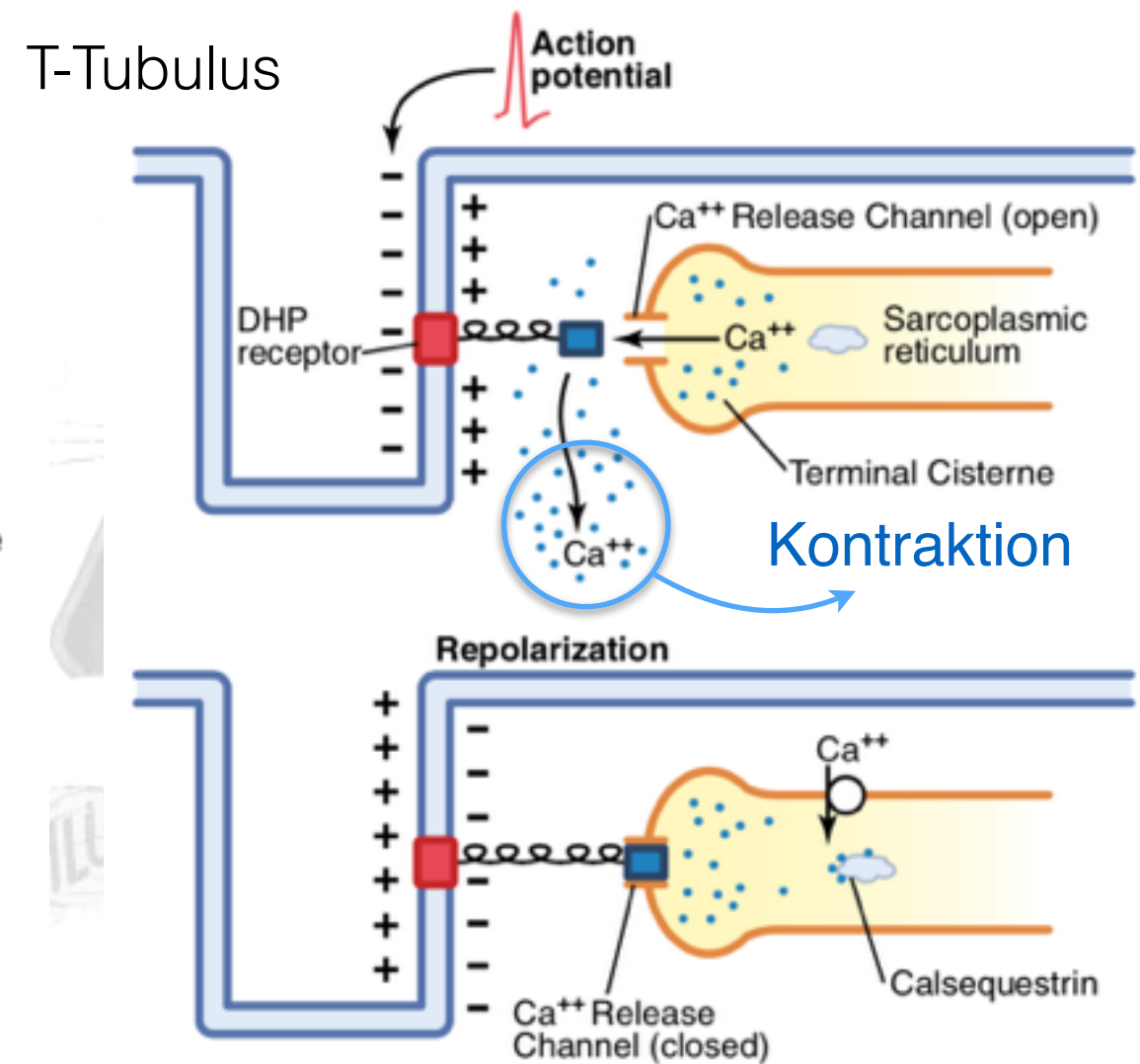
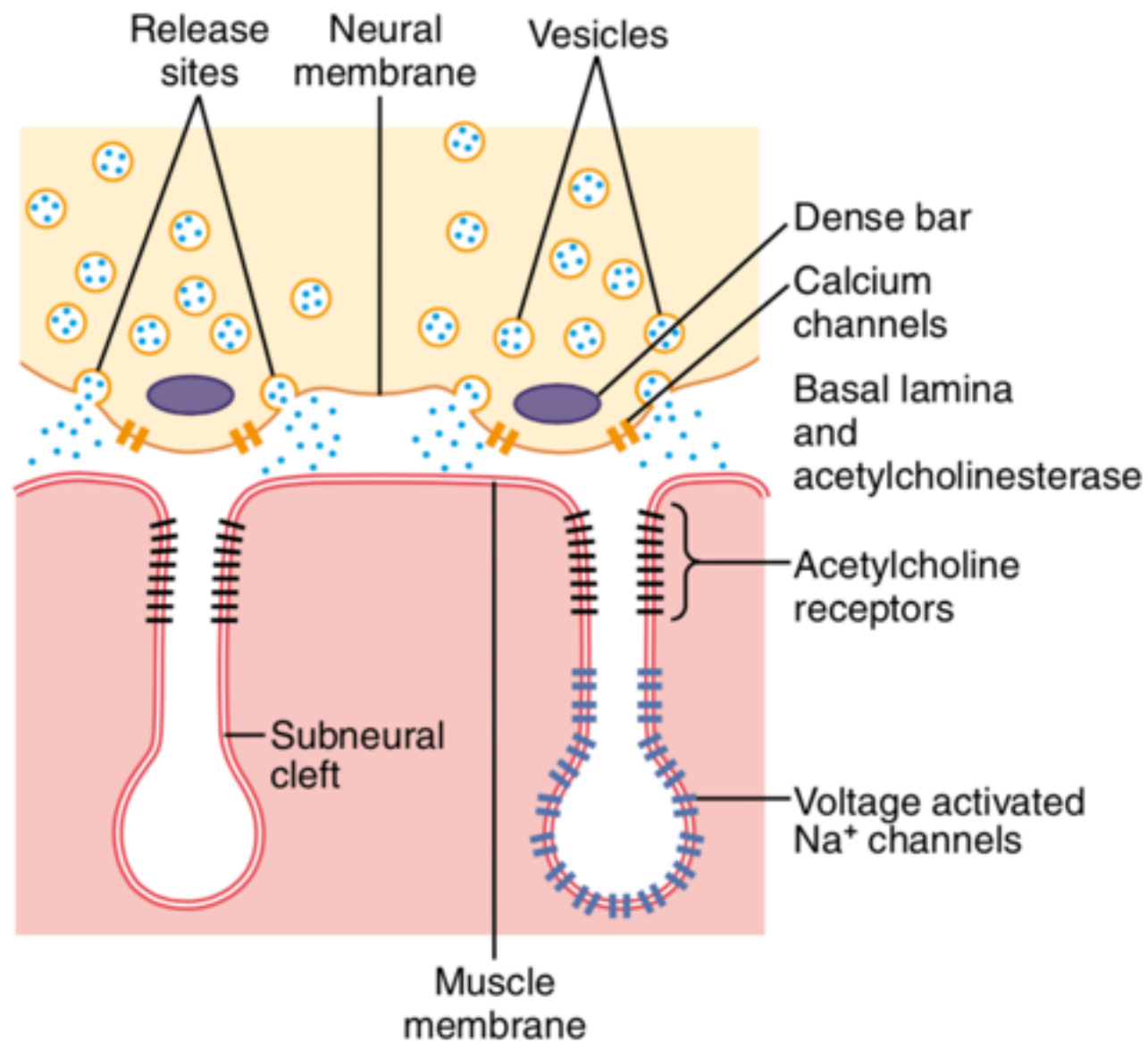
Neuromuskuläre Endplatte



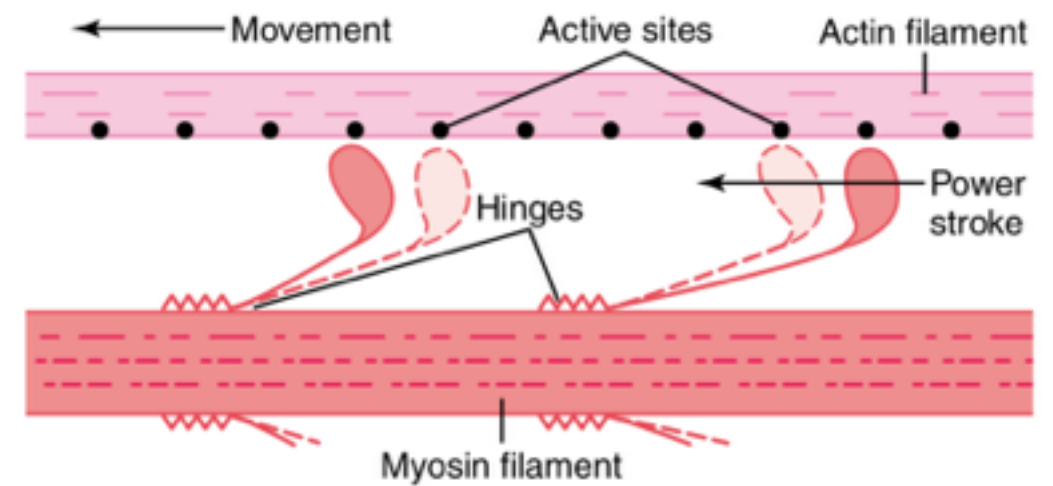
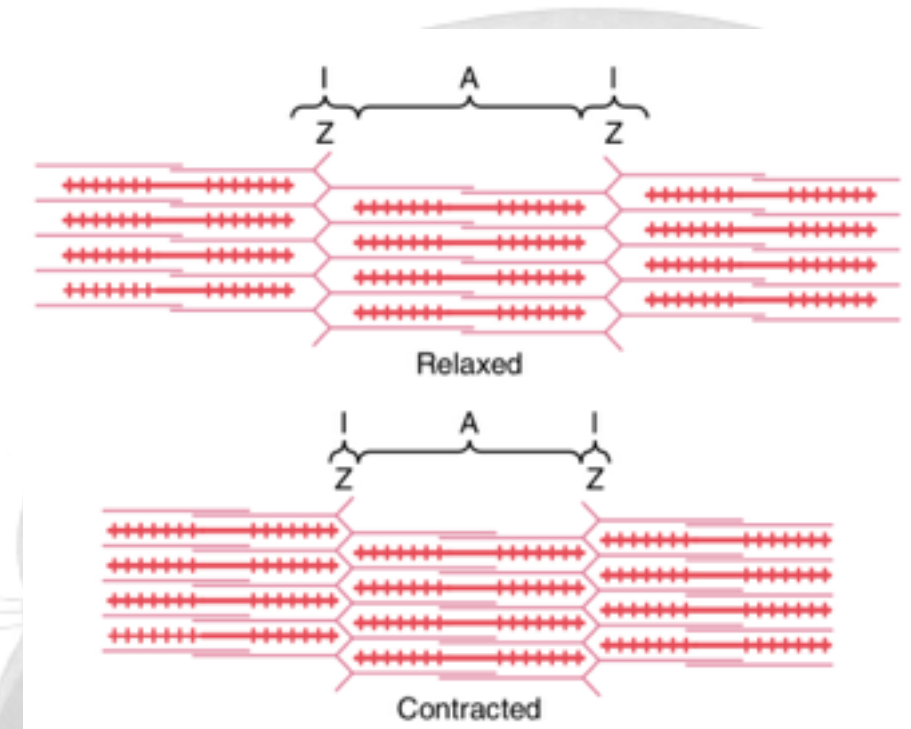
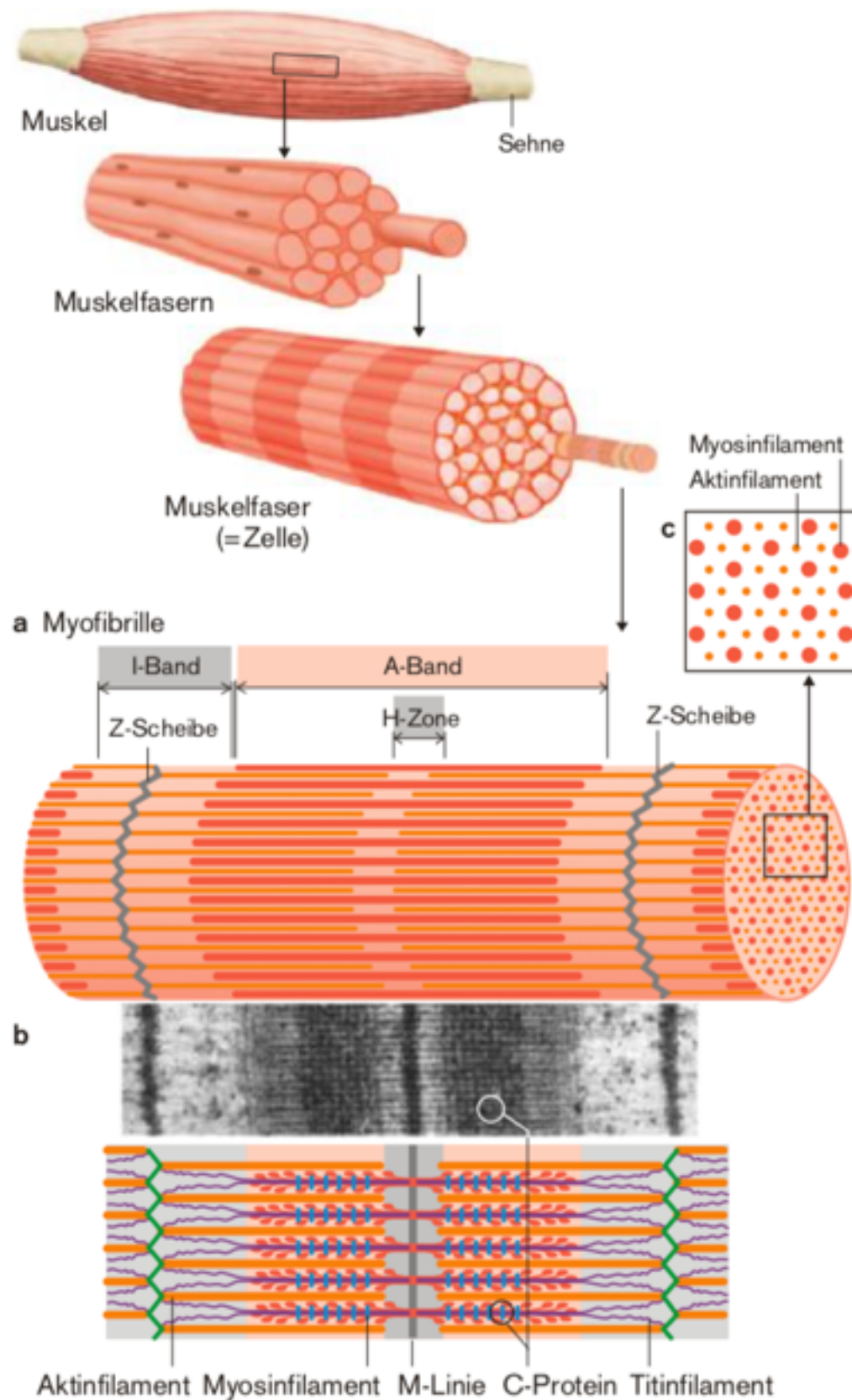
Elektromechanische Kopplung



Elektromechanische Kopplung



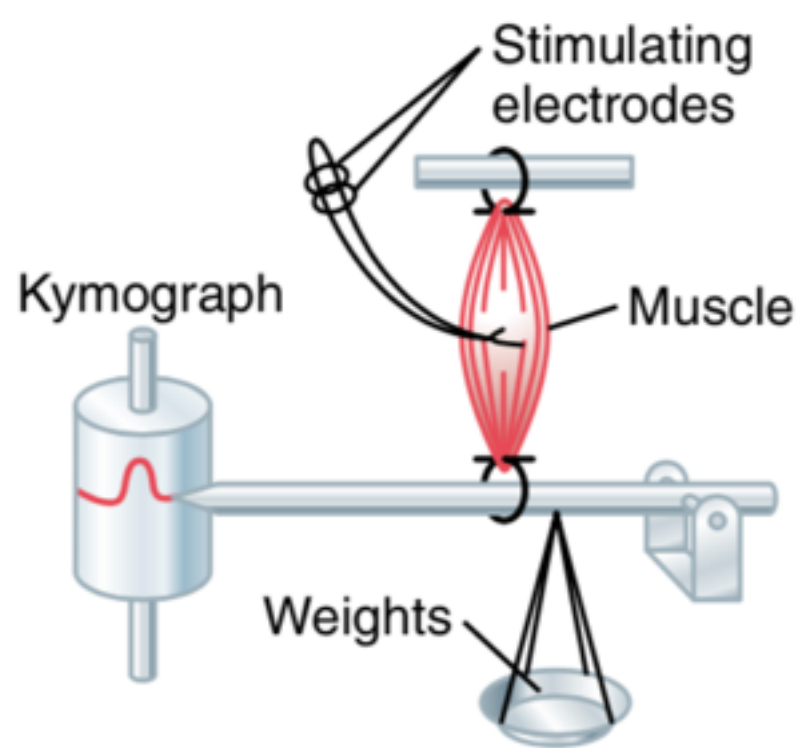
Kontraktion quergestreifter Muskulatur



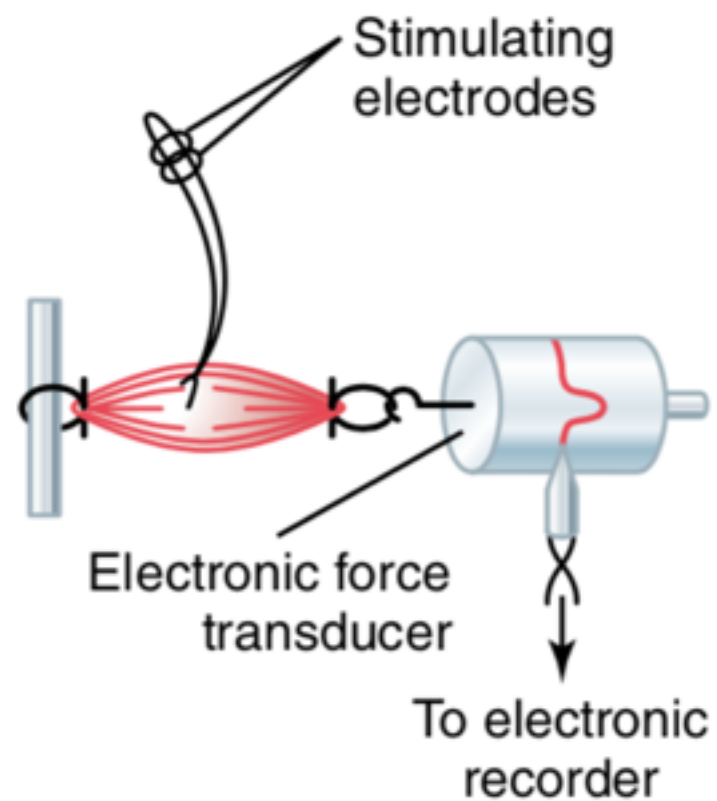
Binden-Kraftschlag-Lösen-Aufrichten

Querbrückenzyklus

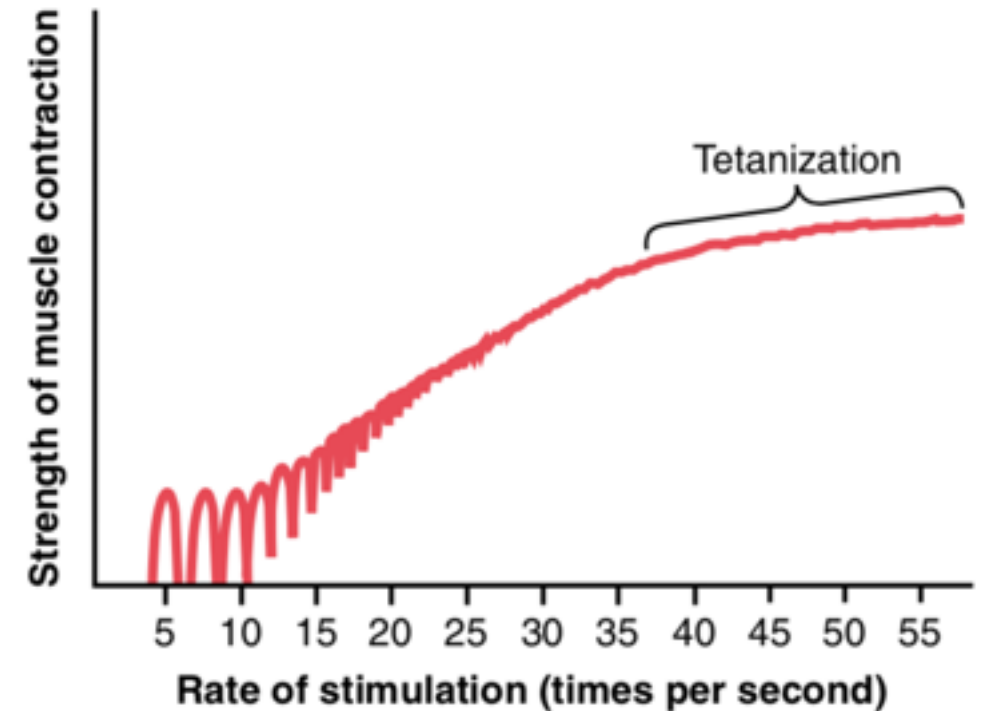
Kraftmessung



Isotonic system

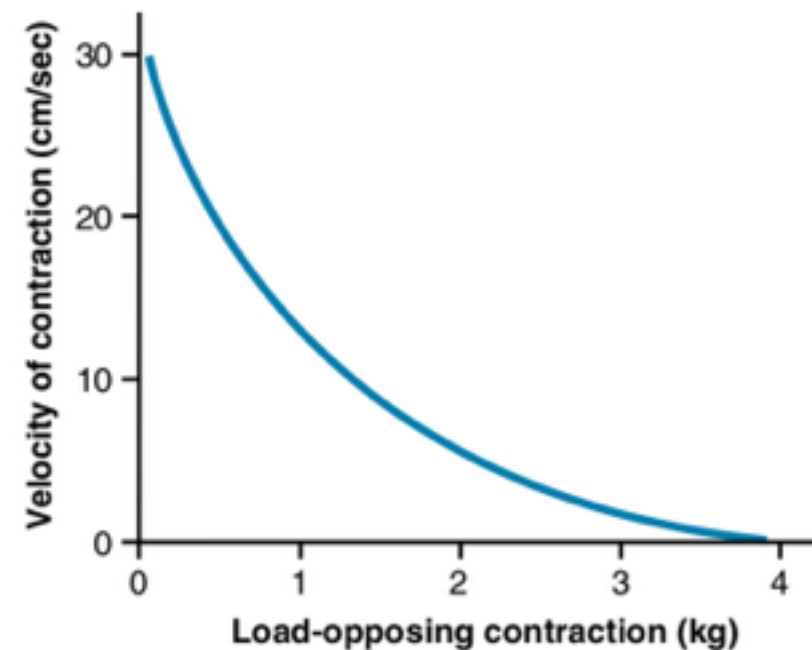
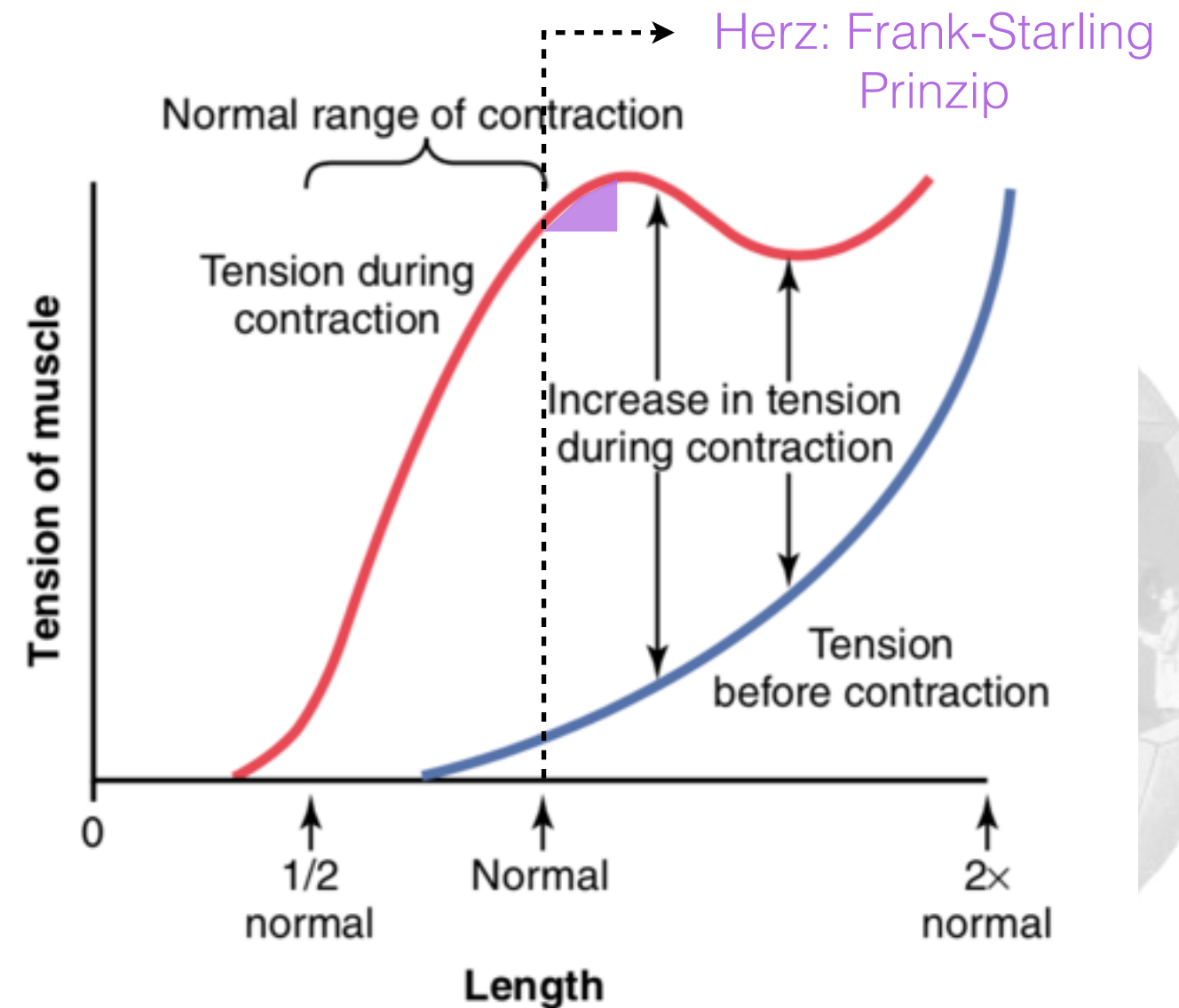
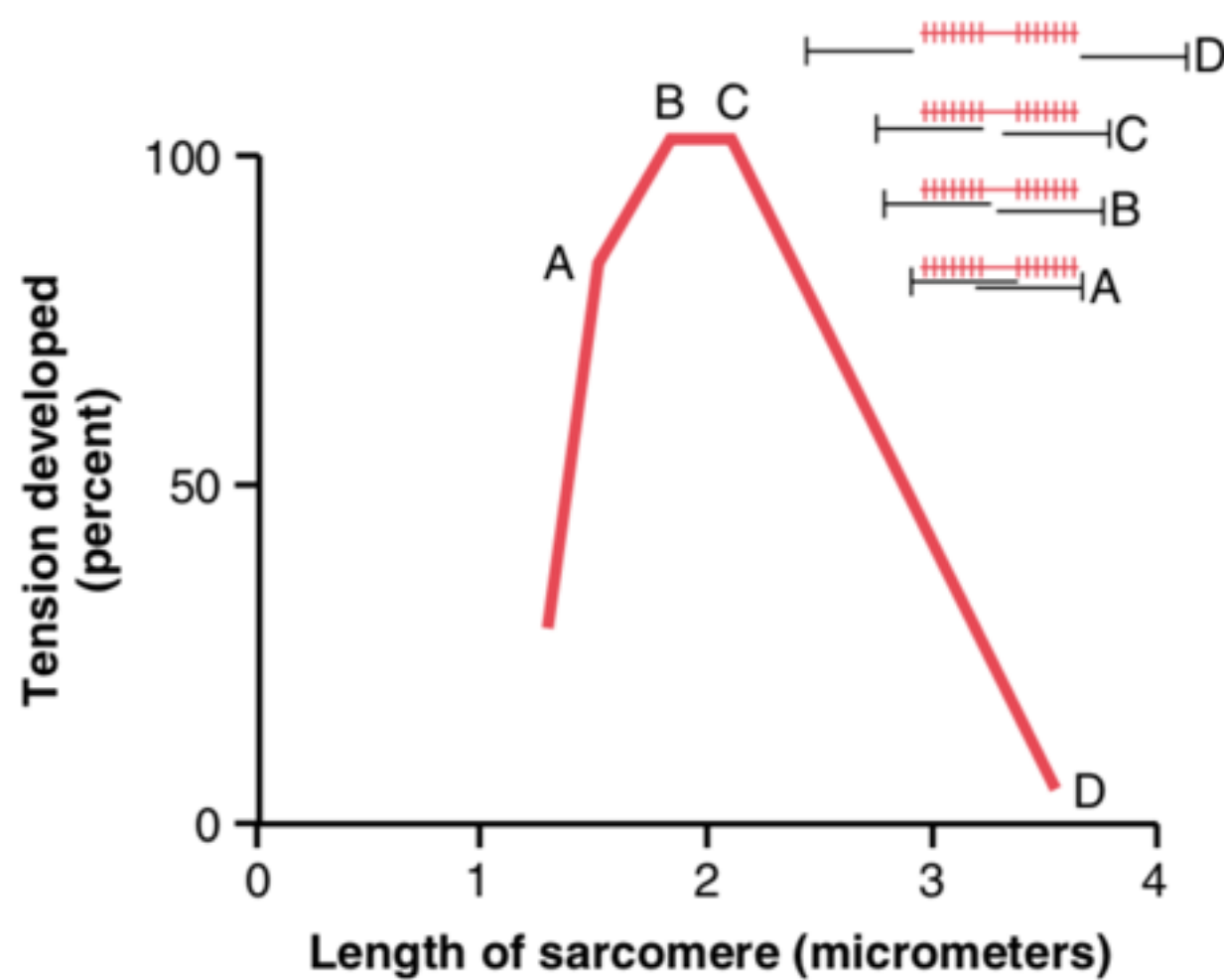


Isometric system



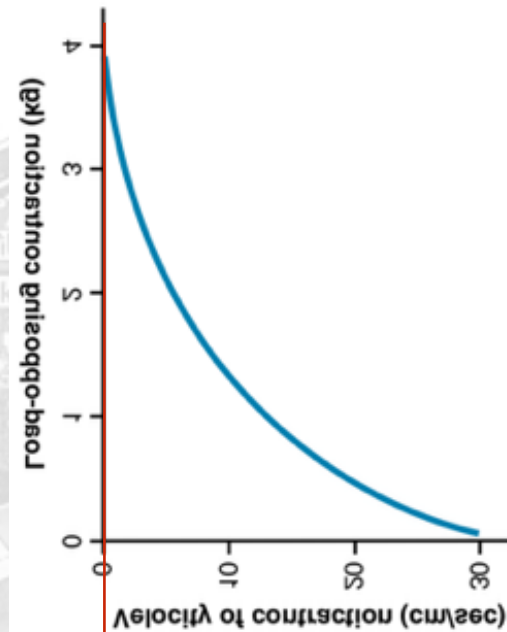
maximale Rekrutierung

Kontraktion quergestreifter Muskulatur

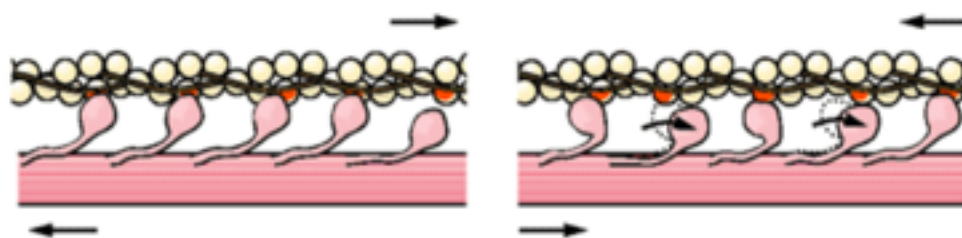
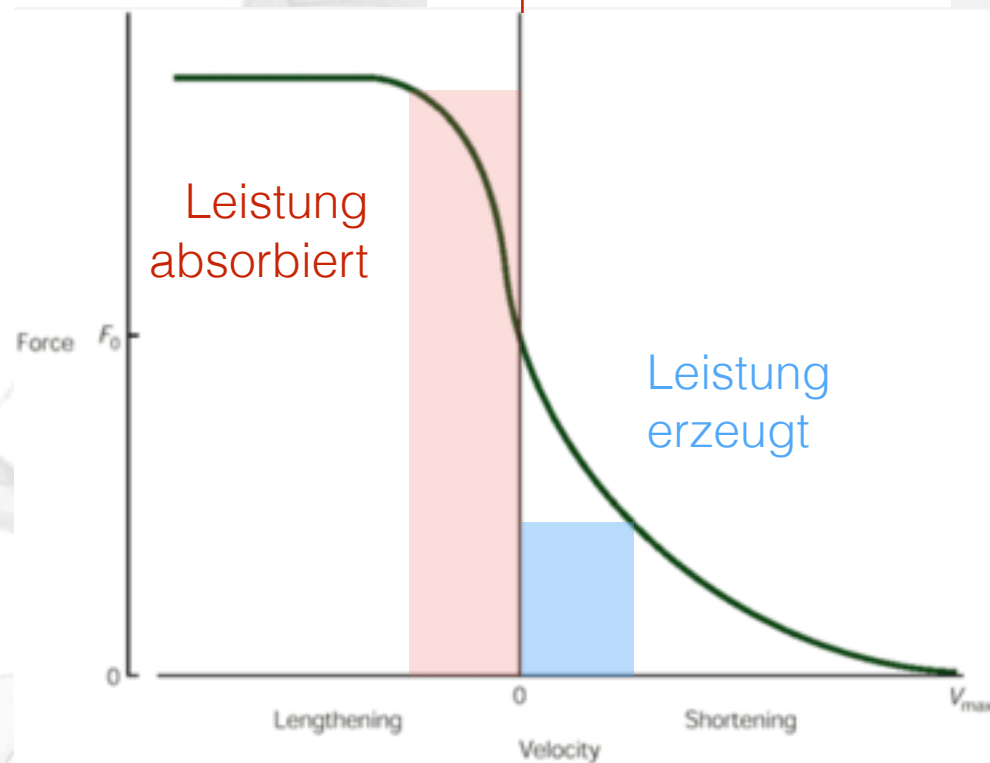


Die Gesamtkraft ist von Länge und Geschwindigkeit abhängig

isometrischer Punkt

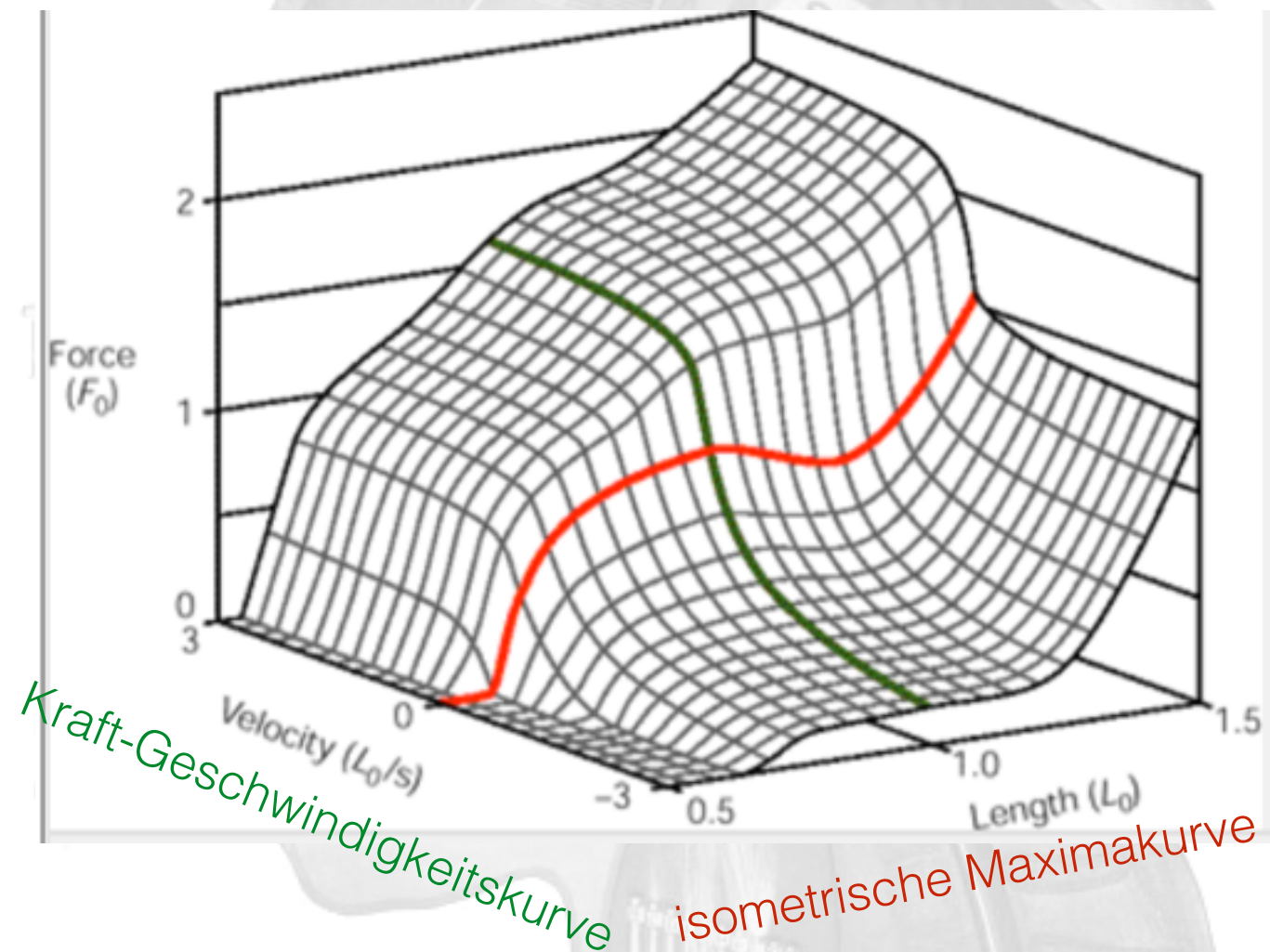


Guyton



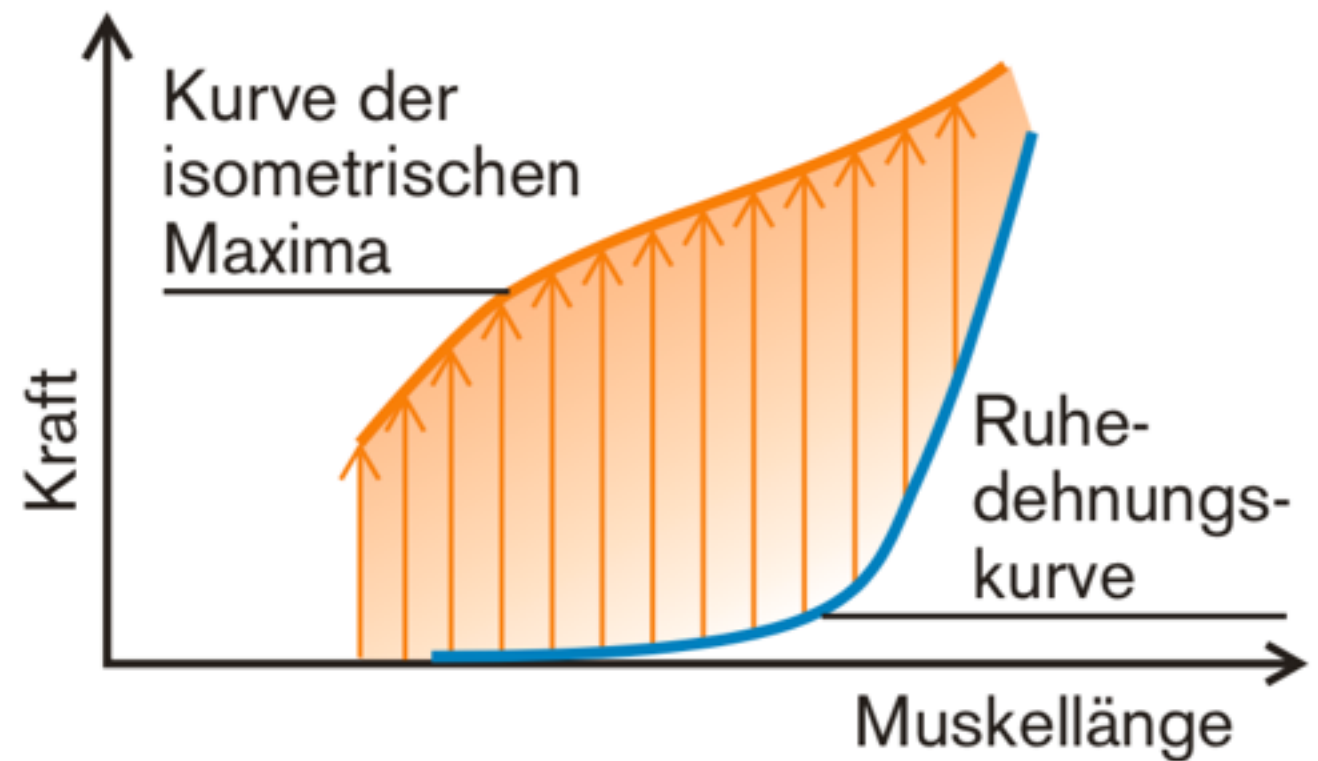
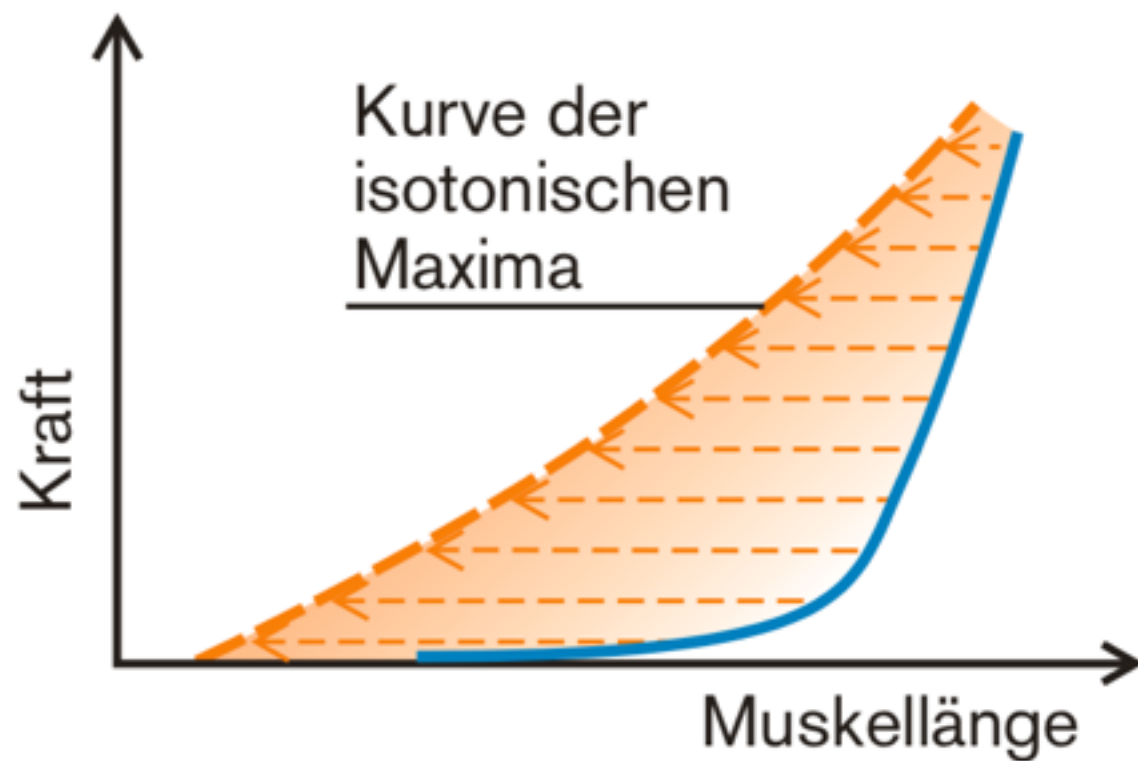
Myosinköpfchen befinden sich am Schlagende bzw. müssen sogar neu anhaften

Kandel, Schwartz & Jessell. Principles of Neural Science. McGraw-Hill Verlag



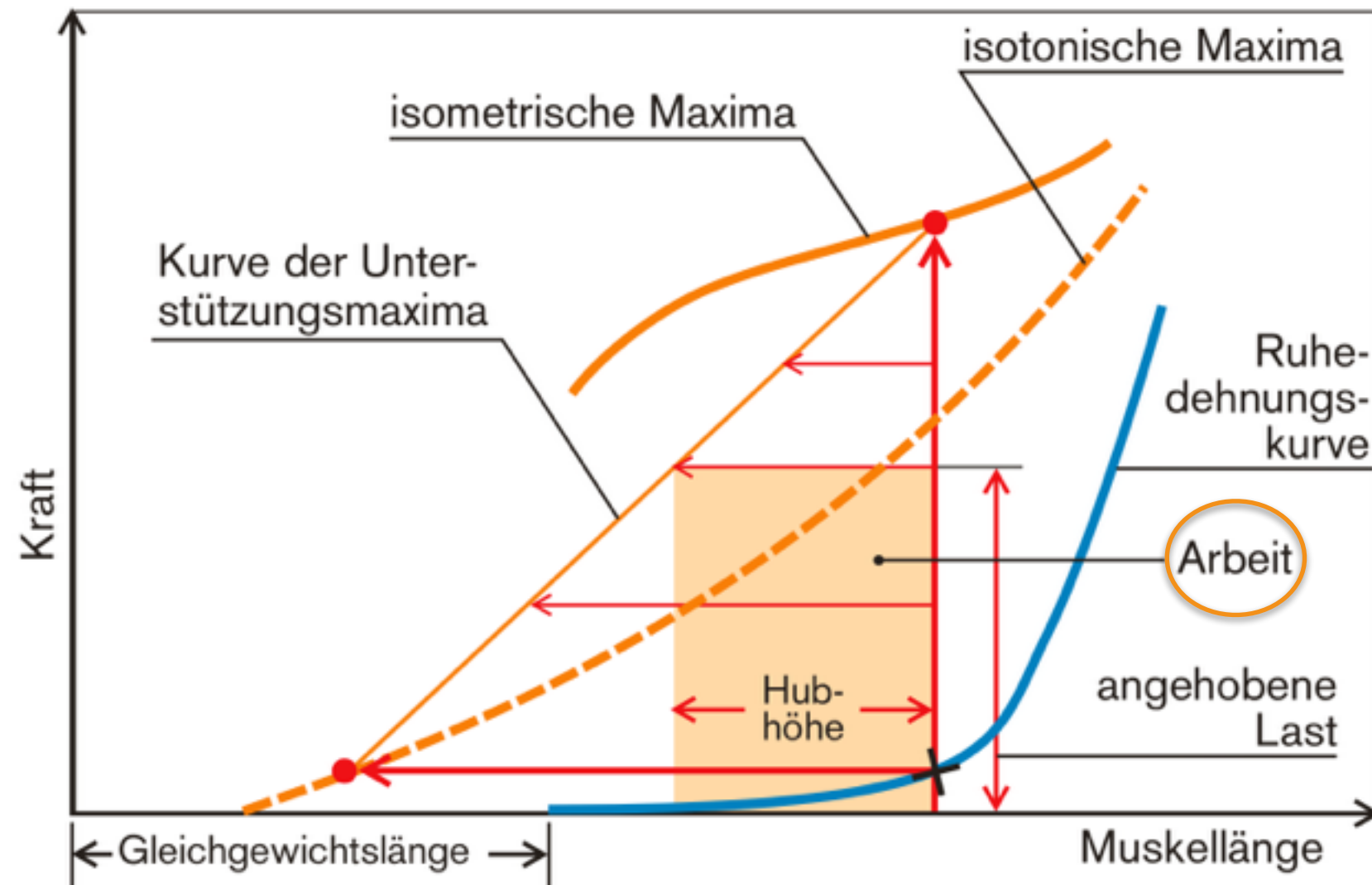
Kraft-Länge-Kurven

isotonische und isometrische Kontraktion

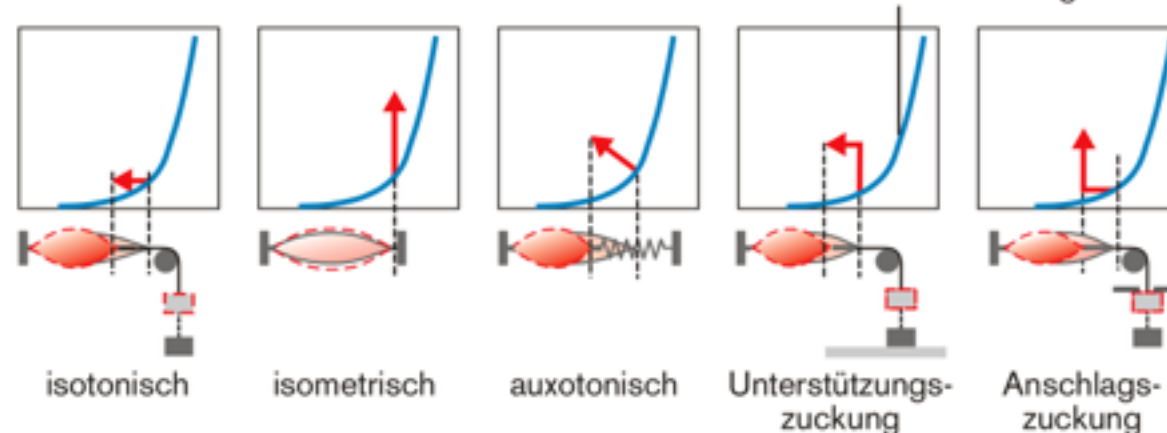


Alles zusammen

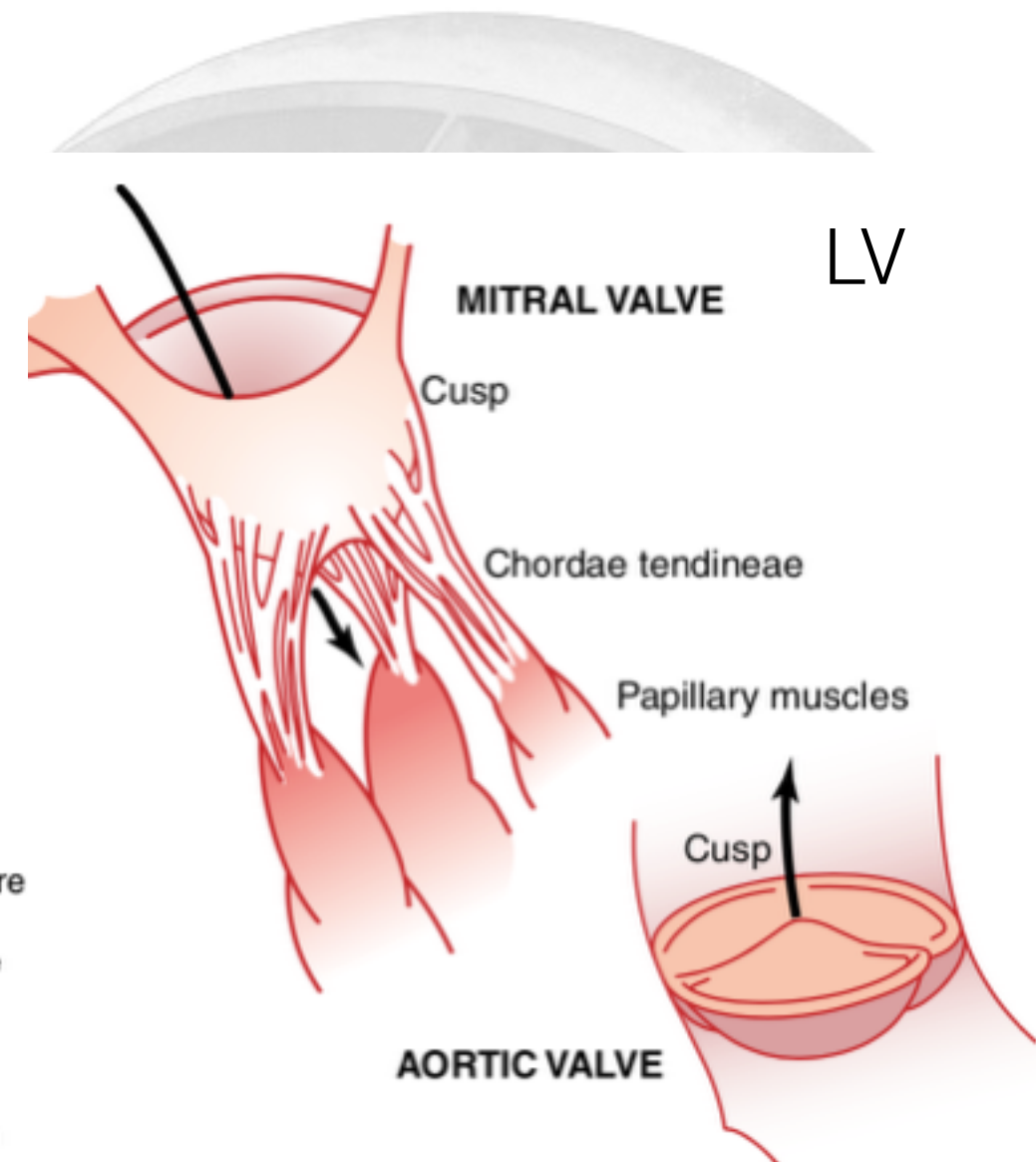
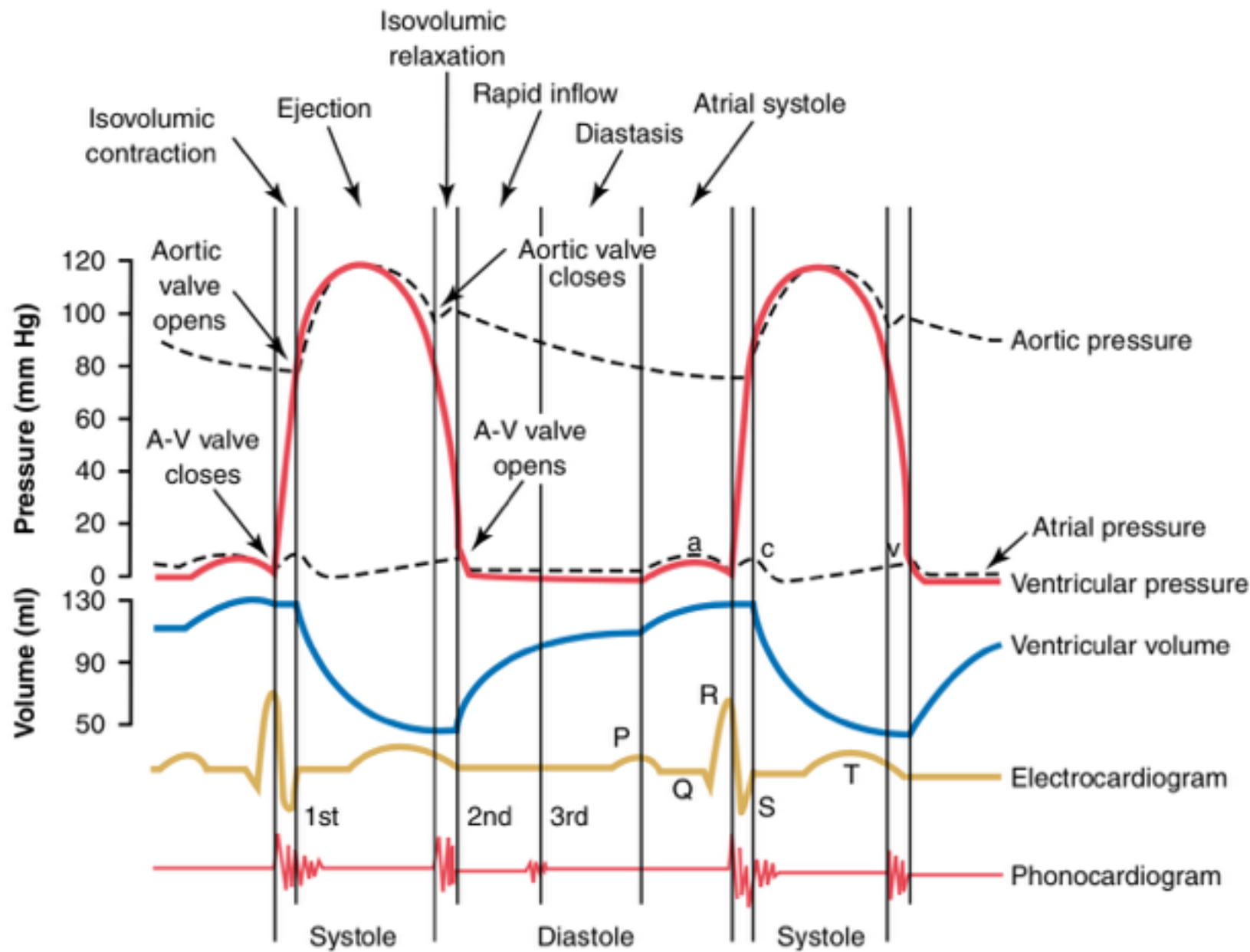
Arbeitsdiagramm des Skelettmuskels



verschiedene Kontraktionsformen

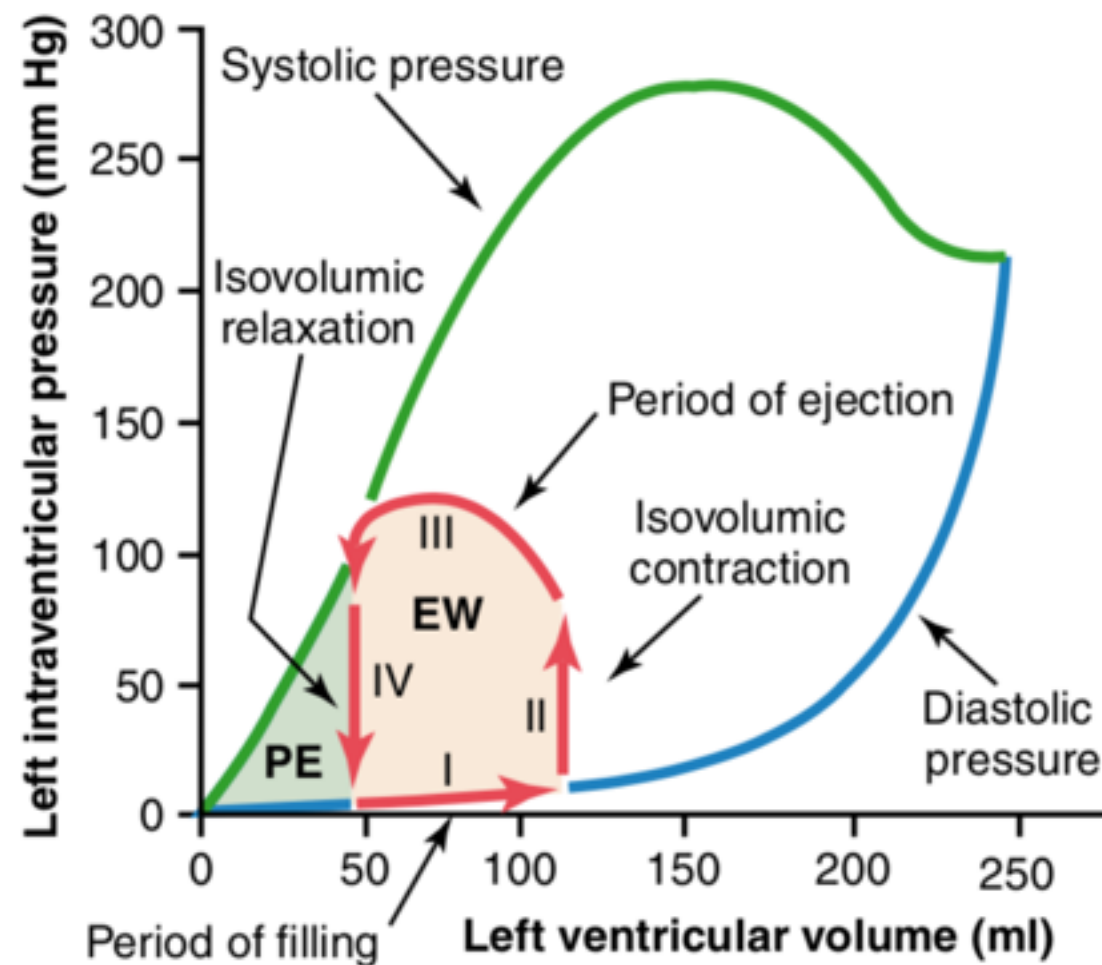


Einer der wichtigsten Muskel bildet einen Hohlraum; das Herz

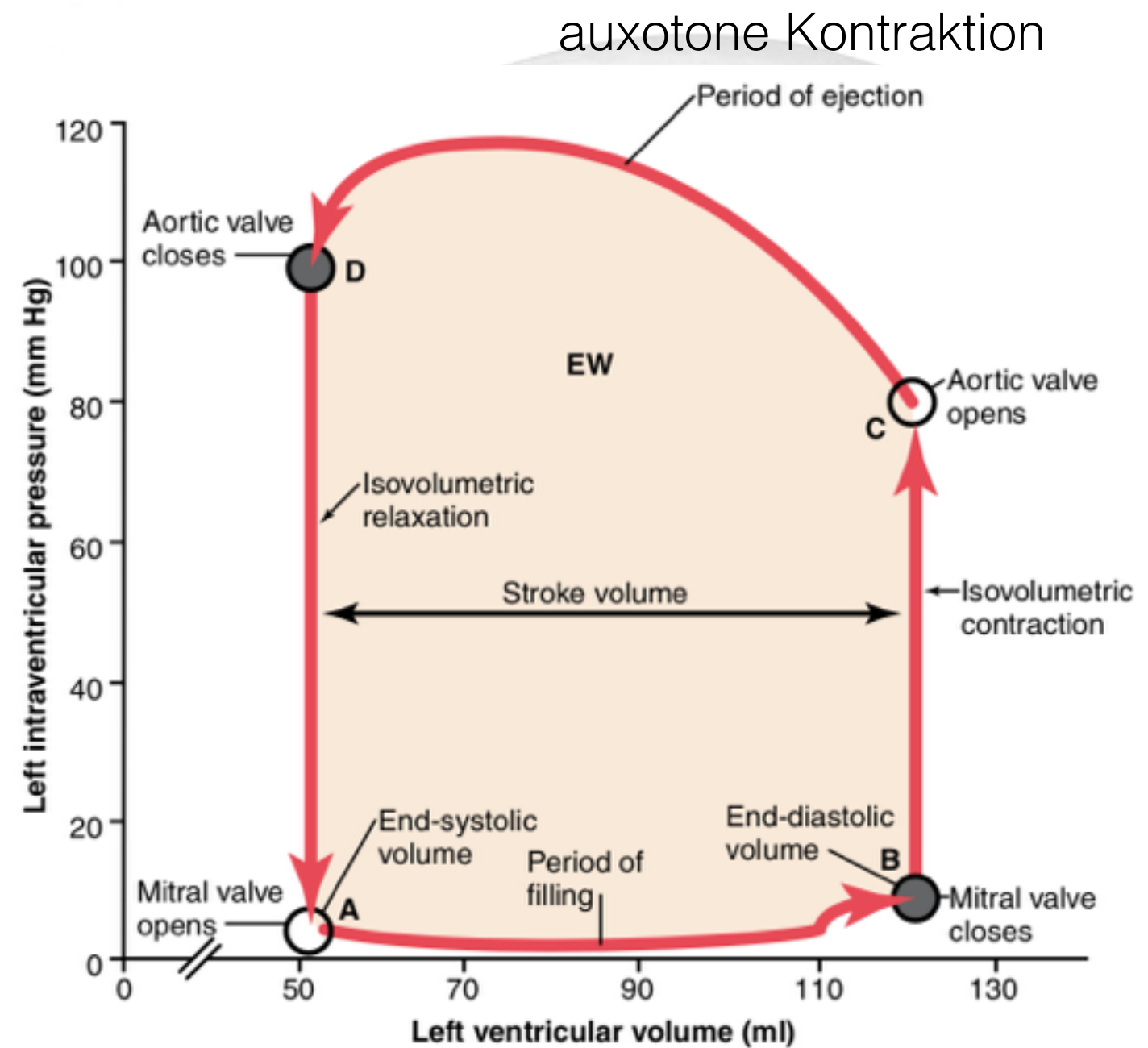


Herzmuskelarbeit

Isometrische Maximakurve



Ruhedehnungskurve

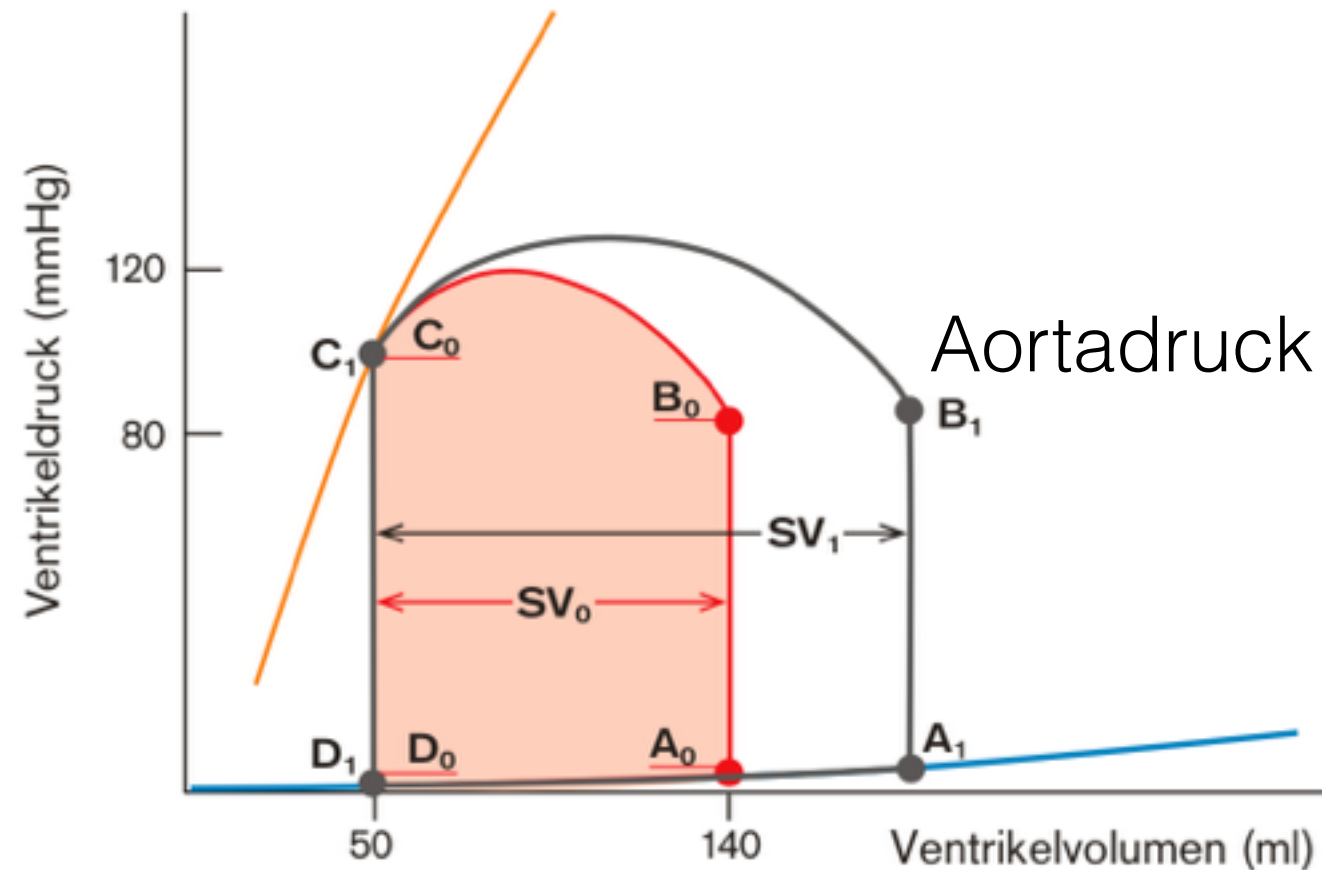


EW external work

Das Herz passt sich Änderungen der Druckverhältnissen an

Vorlast

a Volumenbelastung (preload)

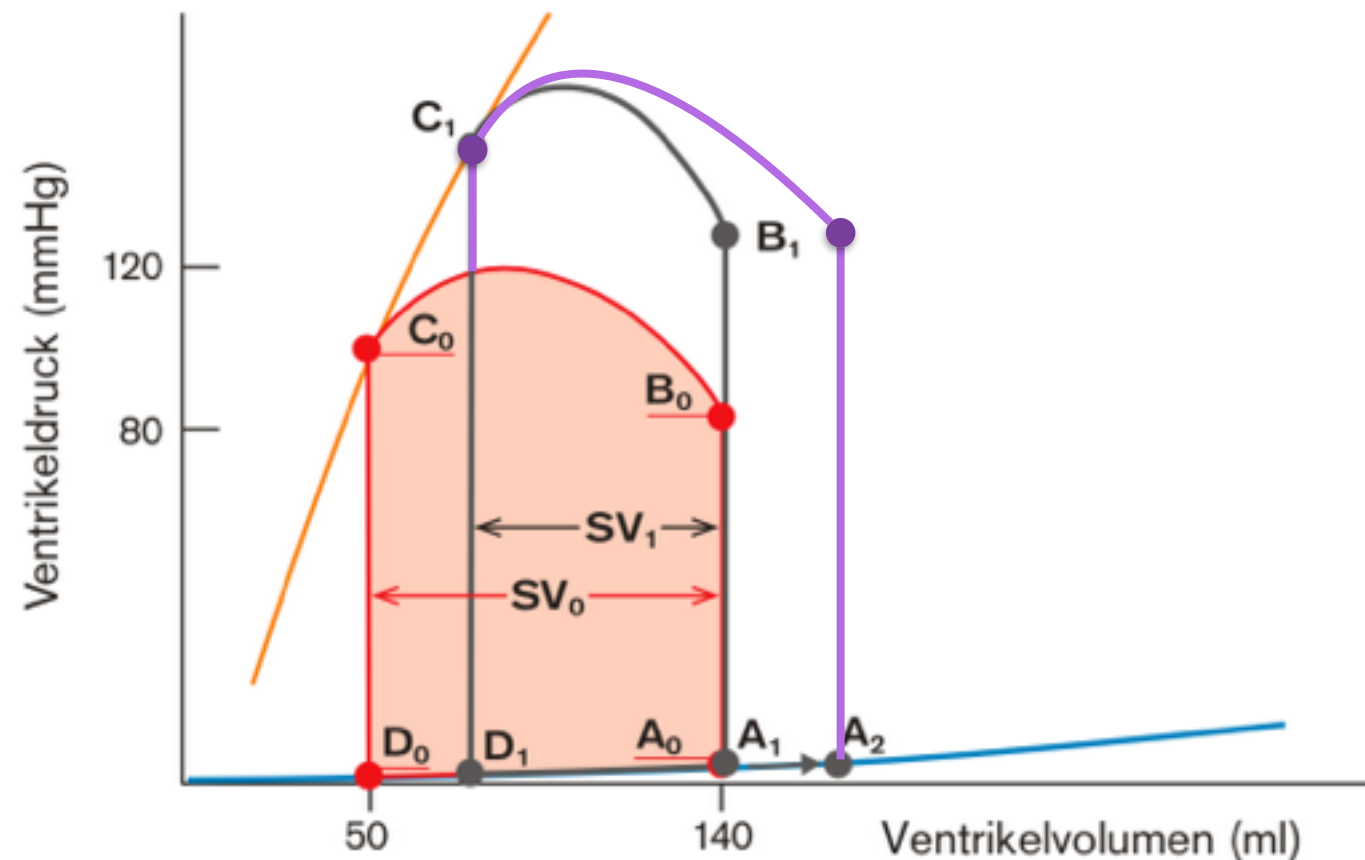


venöser Rückfluß, Atriumdruck
Frank-Starling

SV ↑

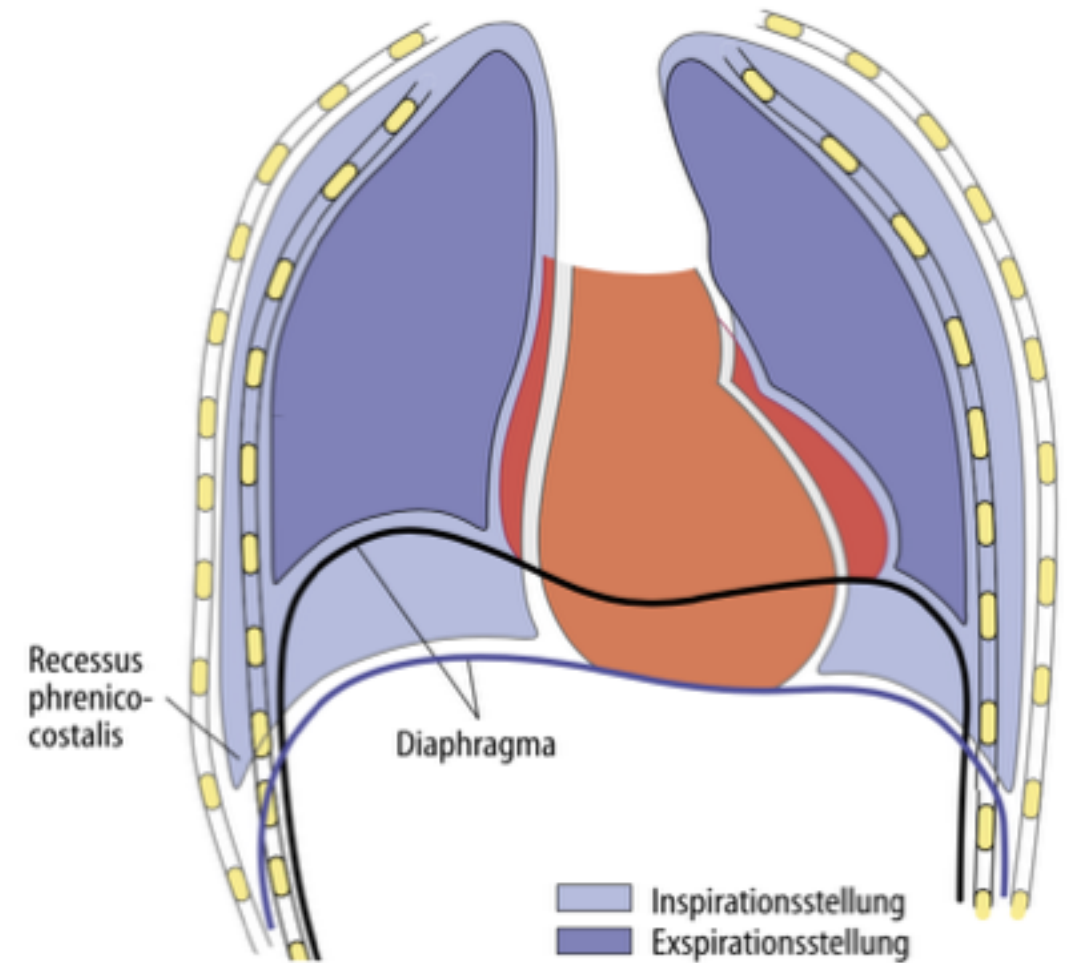
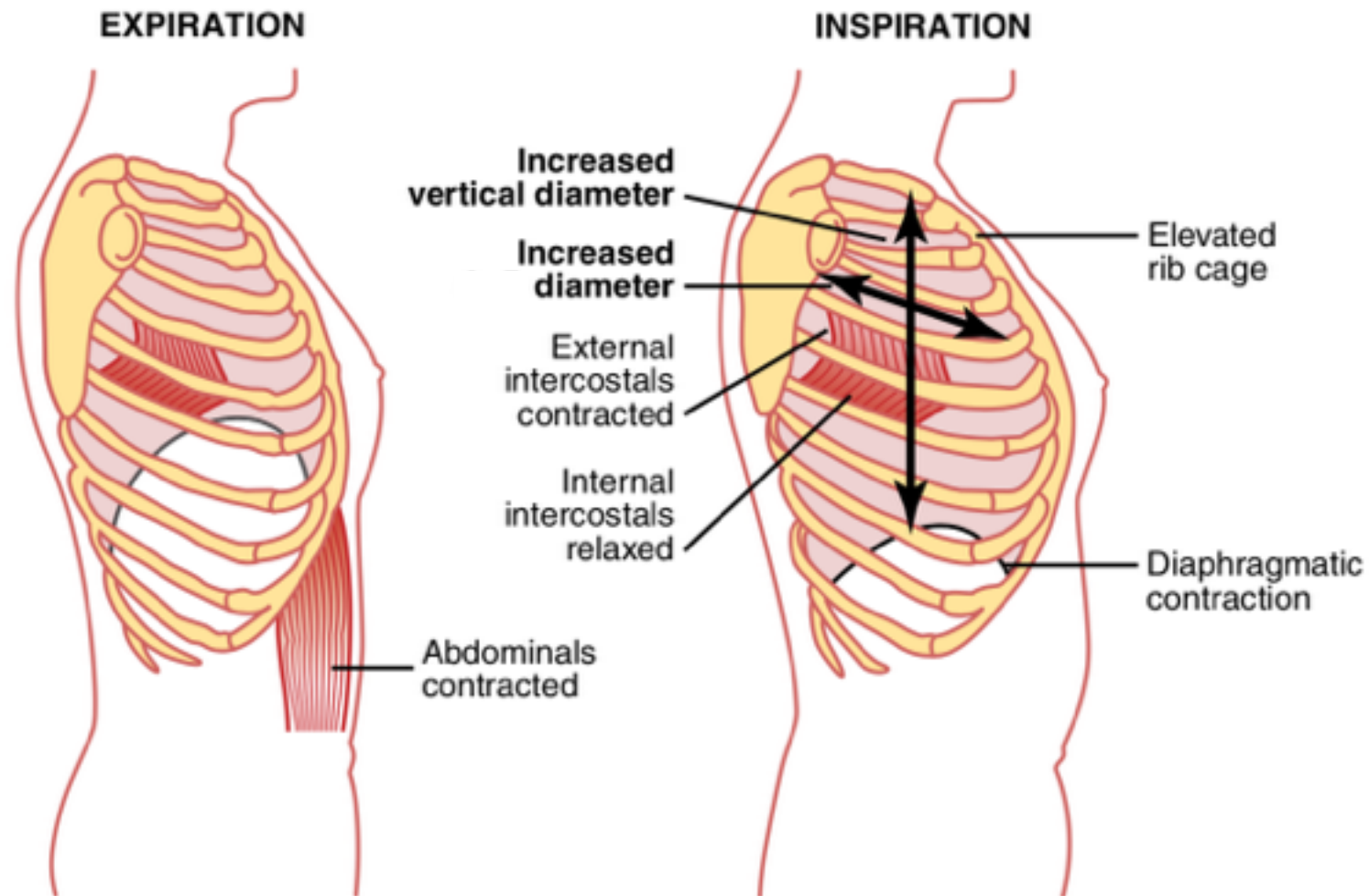
Nachlast

b Nachlasterhöhung (afterload)

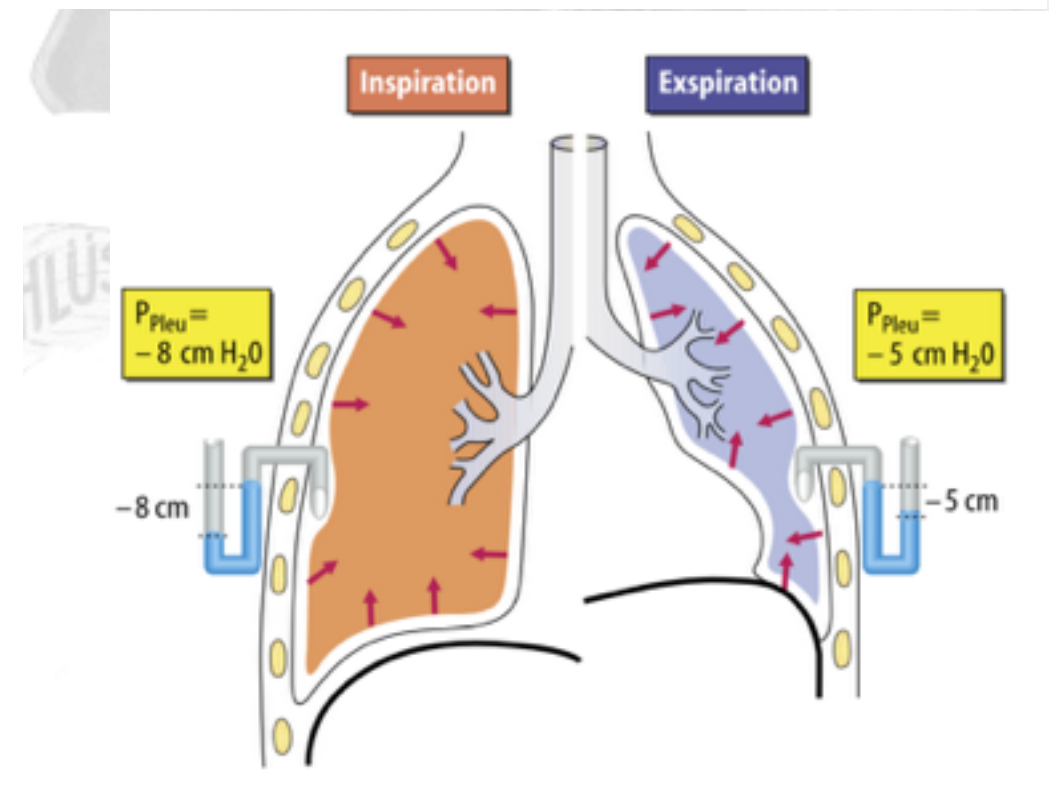
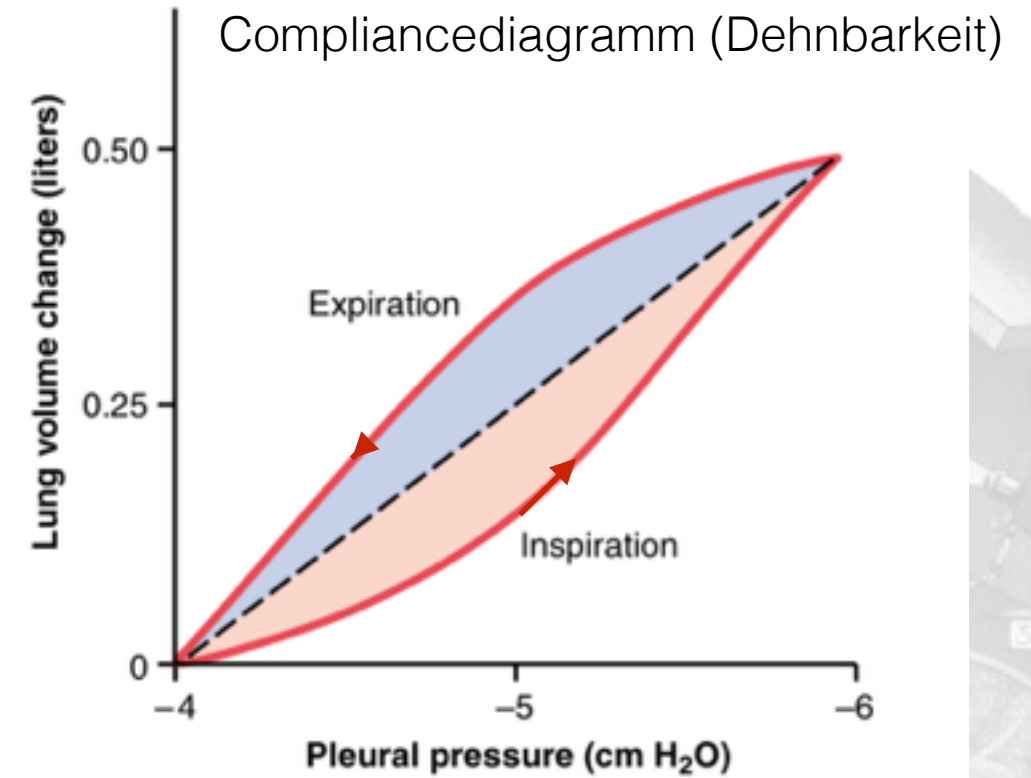
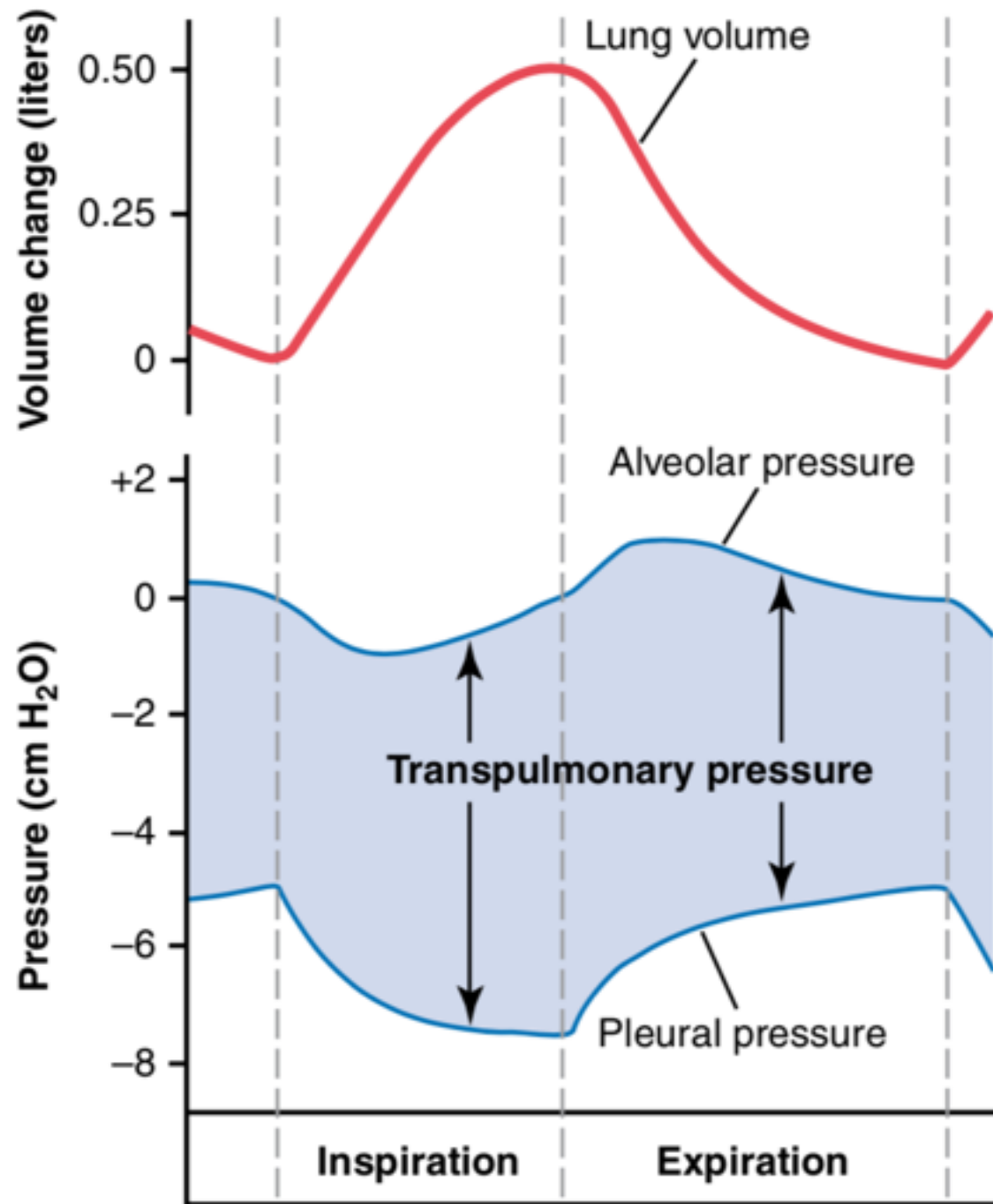


Bluthochdruck, Aorta
erste SV kleiner, Ventrikelrestvol. größer
ab nächster Füllung greift Frank-Starling
und korrigiert

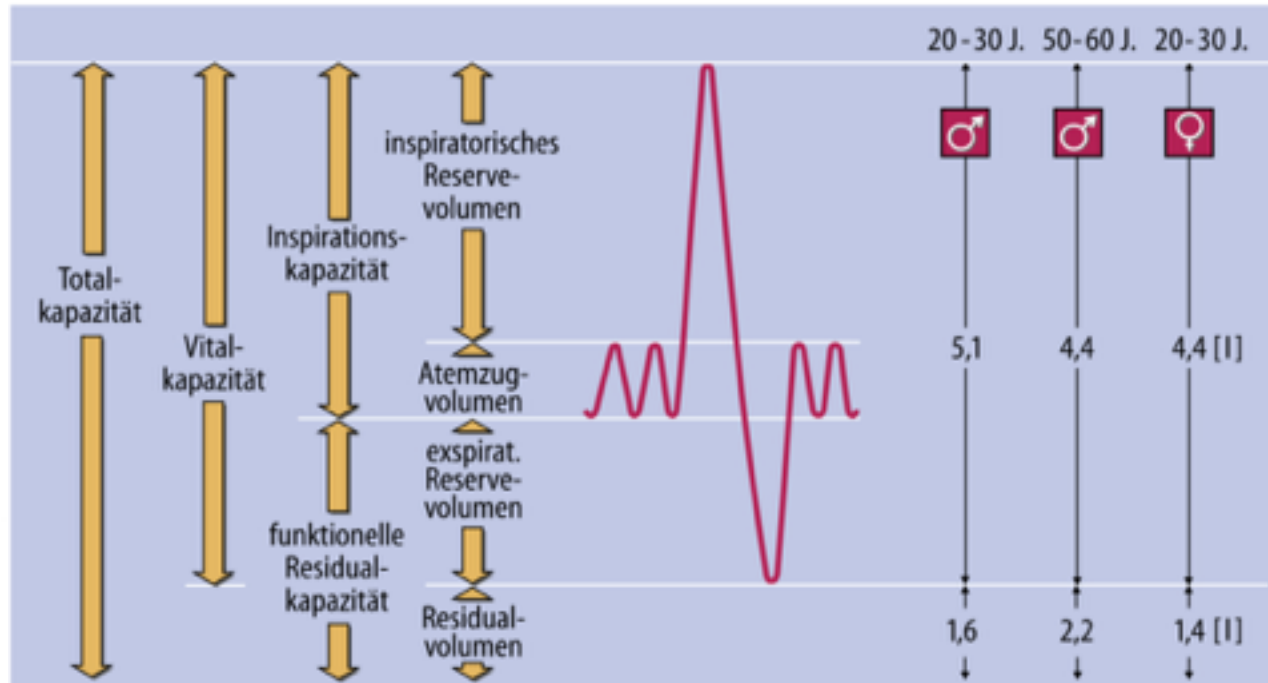
Atemmechanik



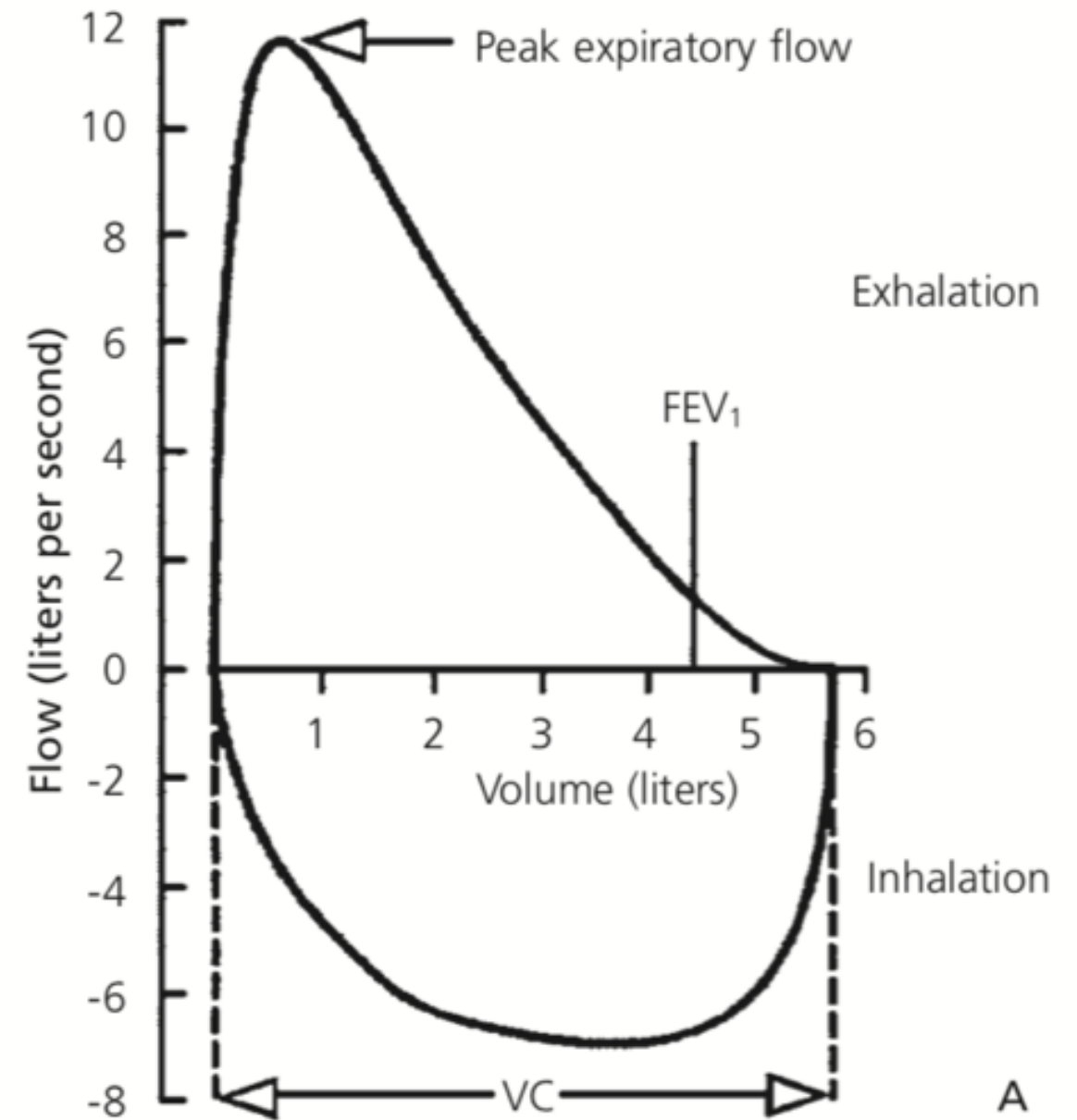
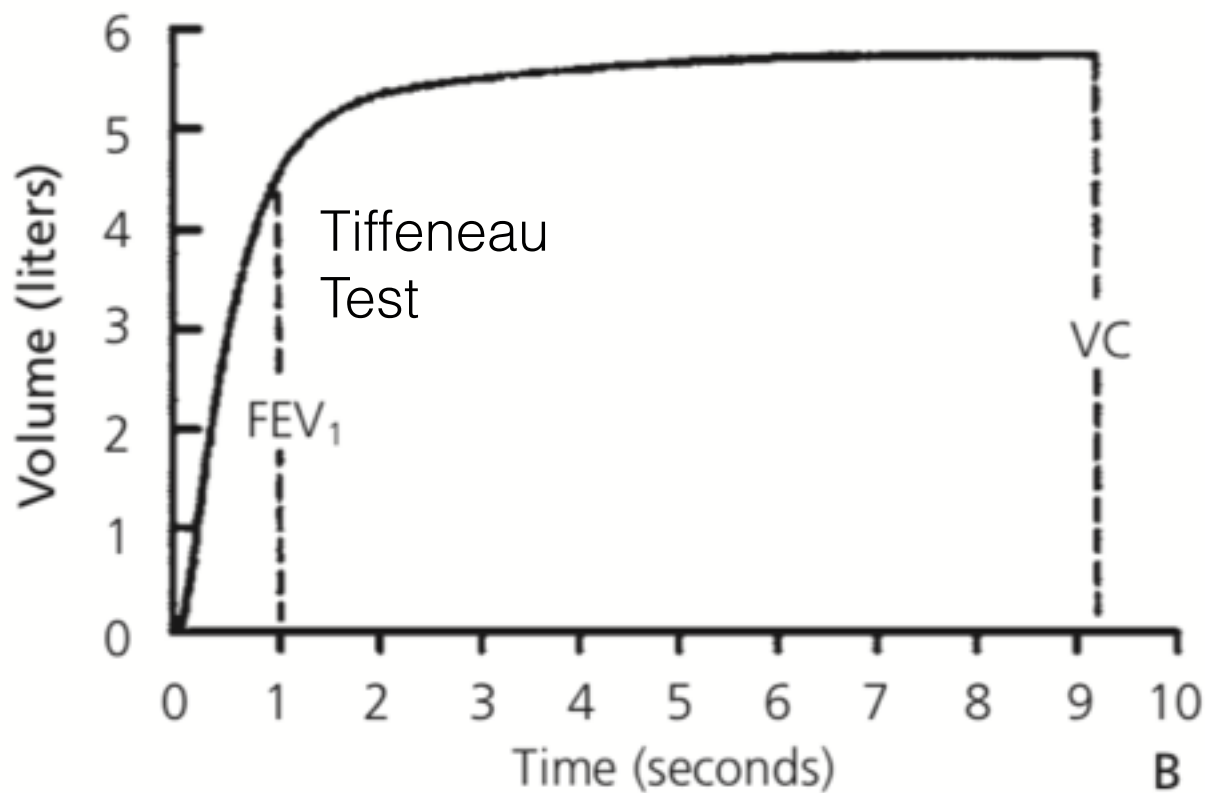
Atemmechanik



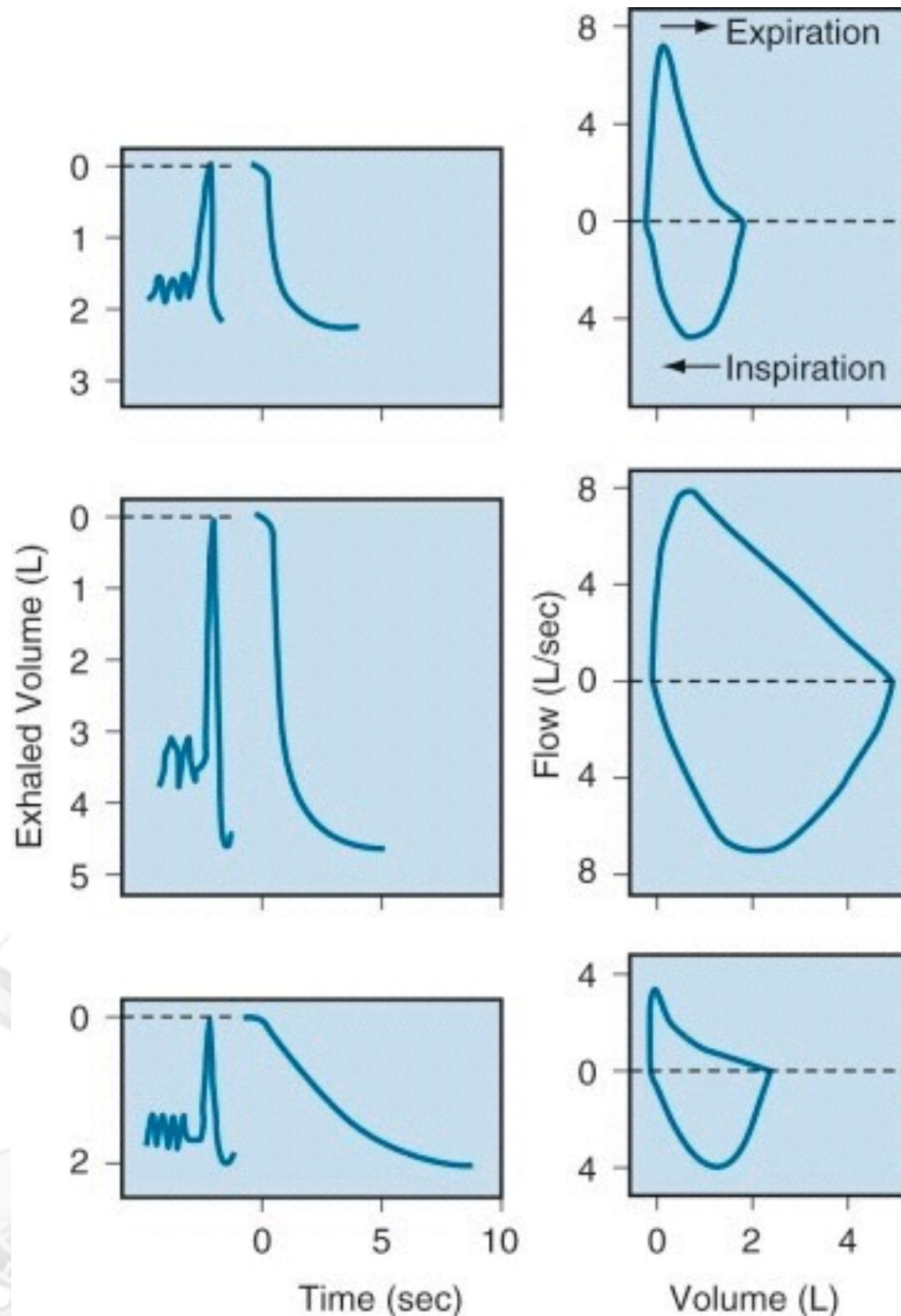
Spirometrie



R. F. Schmidt, F. Lang, G. Thews – Physiologie des Menschen



Spirometrie



Restriktive Ventilationsstörungen
 Compliance ↓
 Lungenvolumina ↓
 FEV1/FVK kann unverändert sein
 (Ödem, Traumata z.B. Rippenfraktur)

Gesund

Obstruktive Ventilationsstörungen
 Atemwegswiderstand ↑
 funktionelle Residualkapazität ↑
 Residualvolumen ↑
 (Asthma Bronchiale, COPD, chr. Bronchitis)
 ↓
 Lungenüberblähung
 (Emphysem)