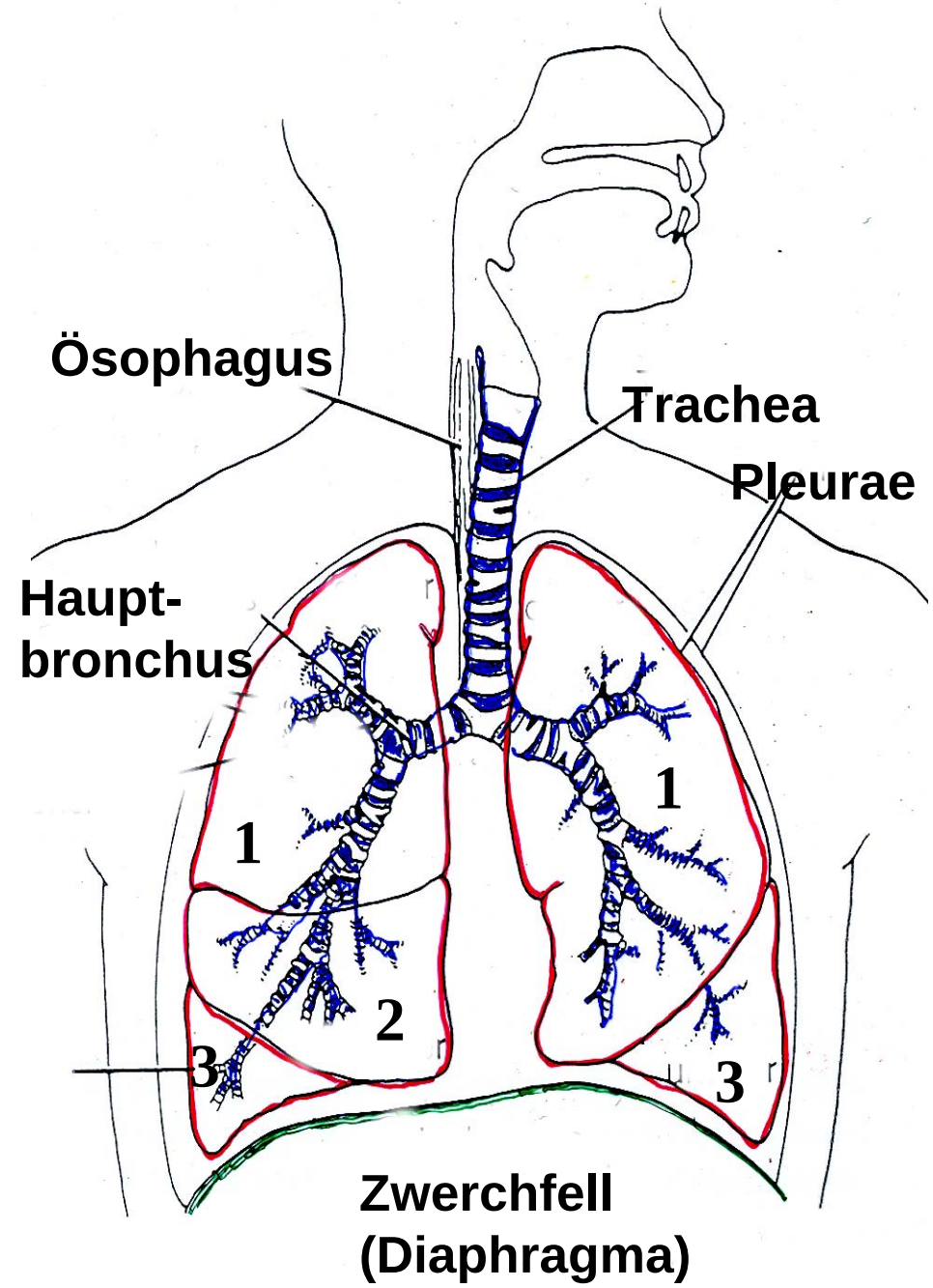
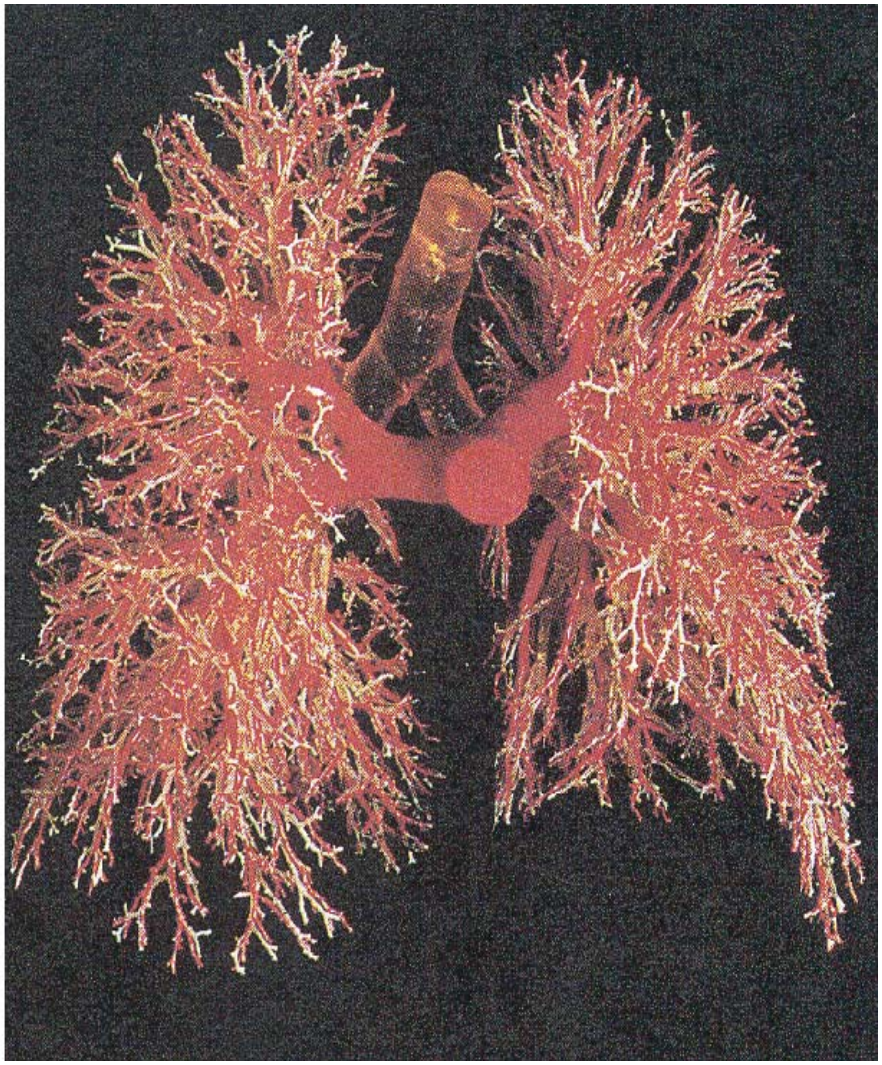
Säugerlunge

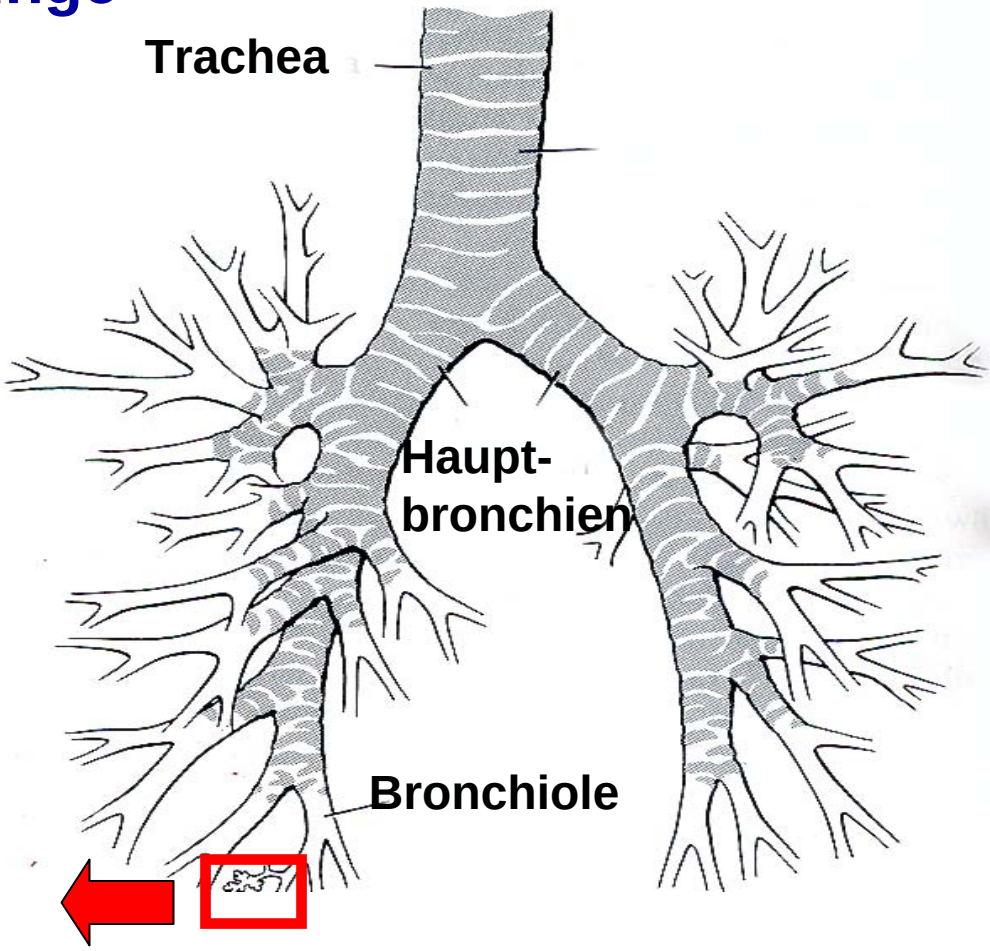


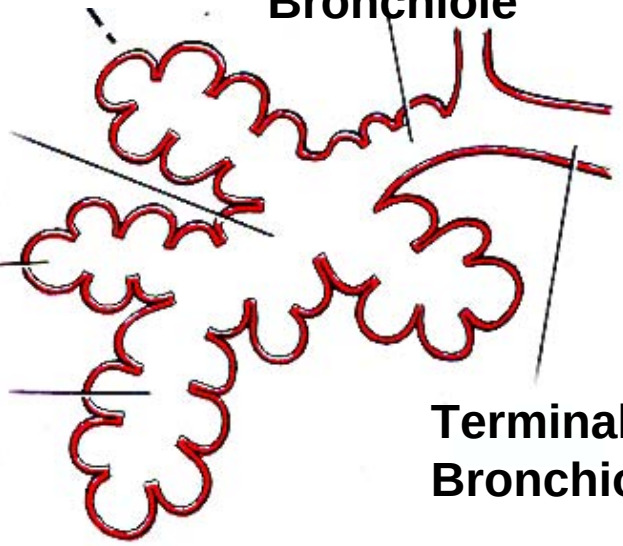
Innere Lungenoberfläche: 50-100 m^2
Körperoberfläche: 2 m^2



Säugerlunge

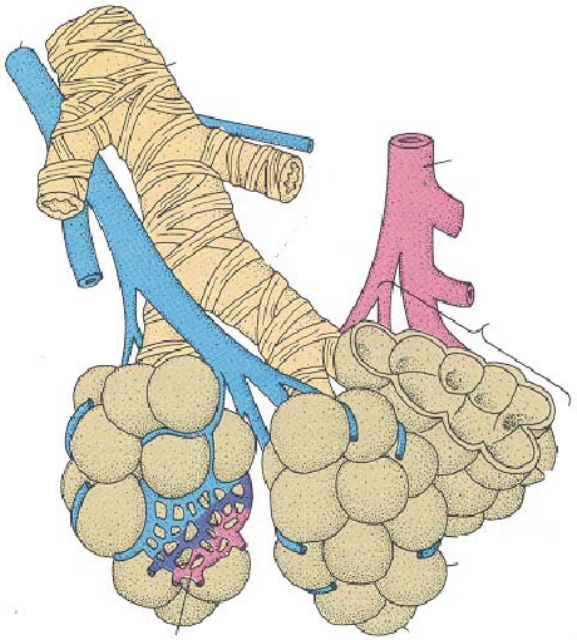
Alveole =
Lungenbläschen

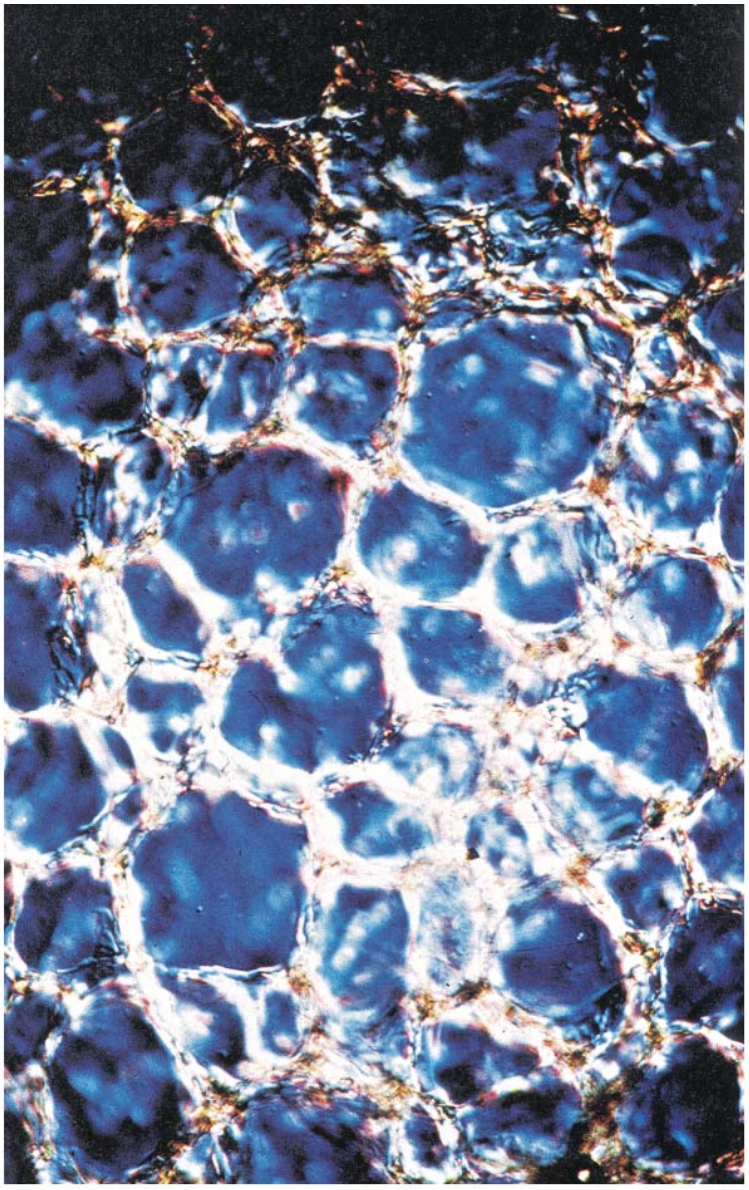




Eckert

Säugerlunge

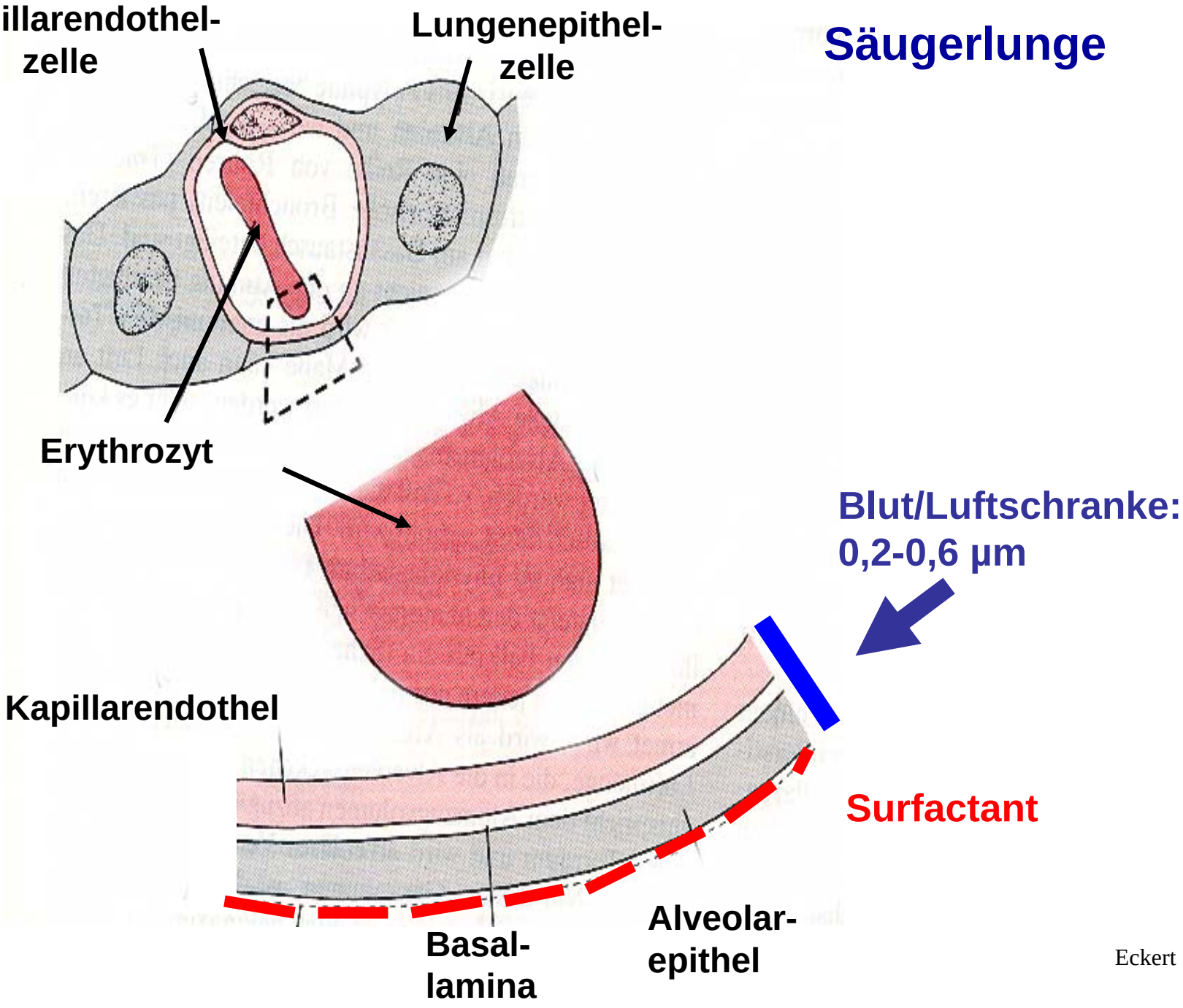




Zahl der Alveolen (Mensch):
300 Millionen
Alveolendurchmesser: 250 µm

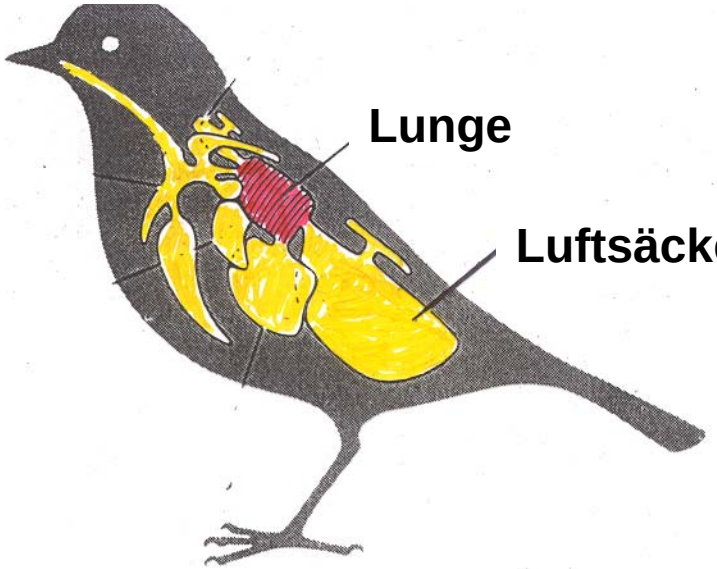
Dorrit;Benner

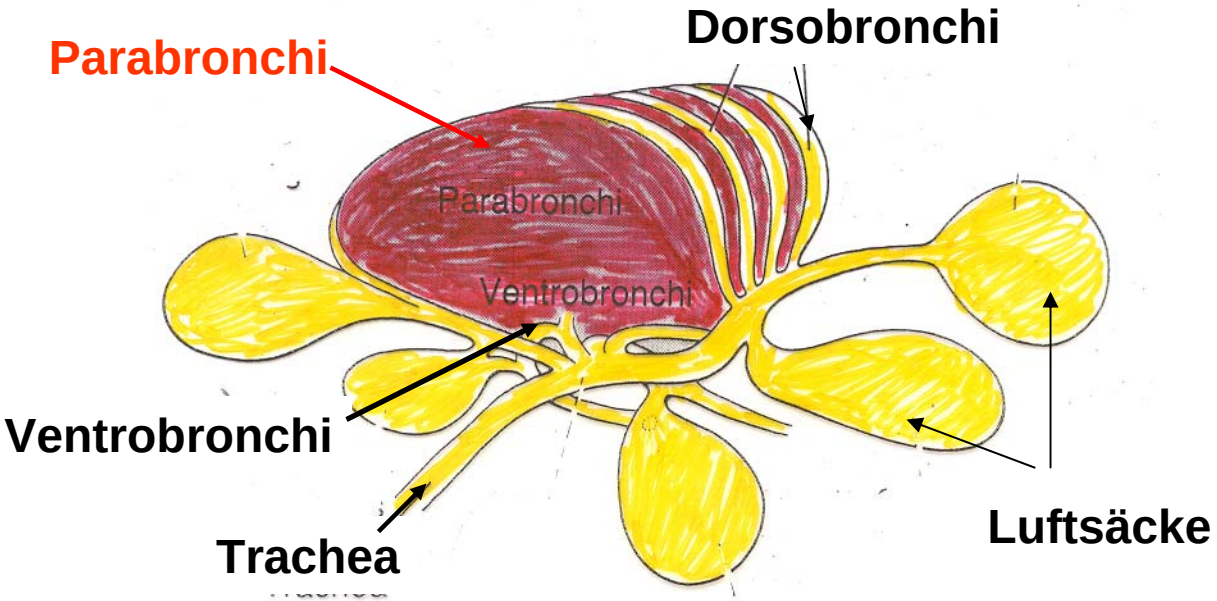
Säugerlunge



Eckert

Vogellunge

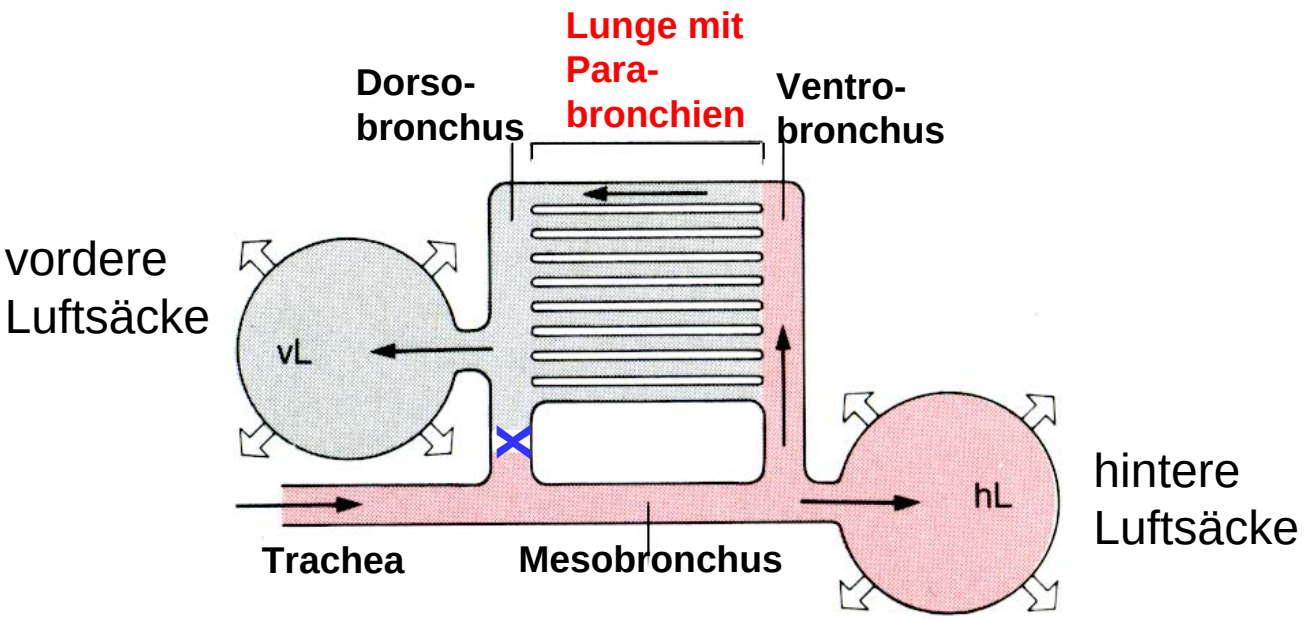




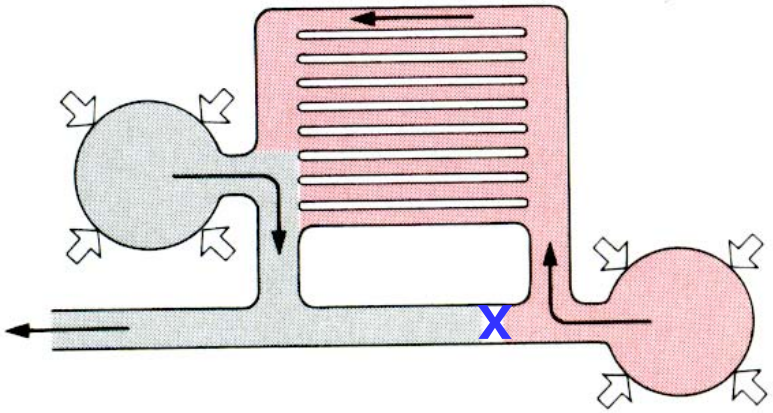
Eckert

Vogellunge

Einatmung



Ausatmung



Wehner Gehring p.295

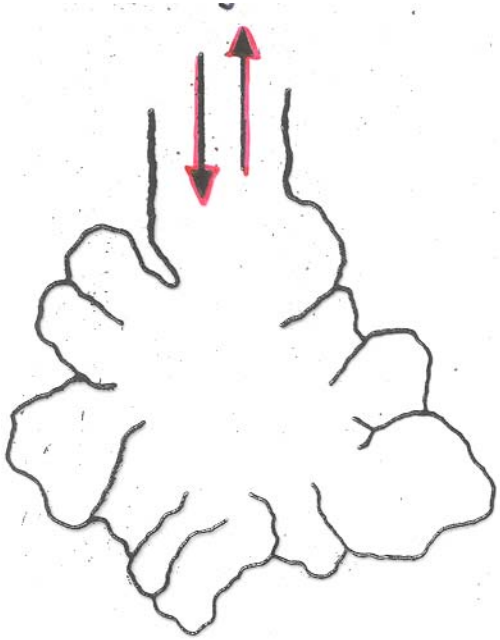
Säugetier

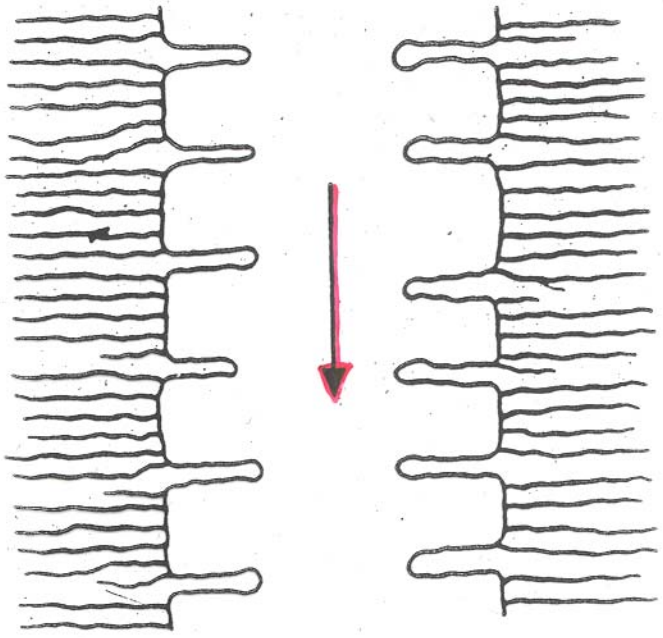
Vogel

Alveolen

Parabronchien

Blut/Luft-schranke: 0.2- 0.6 µm





Blut/Luft-schranke: 0.1 µm

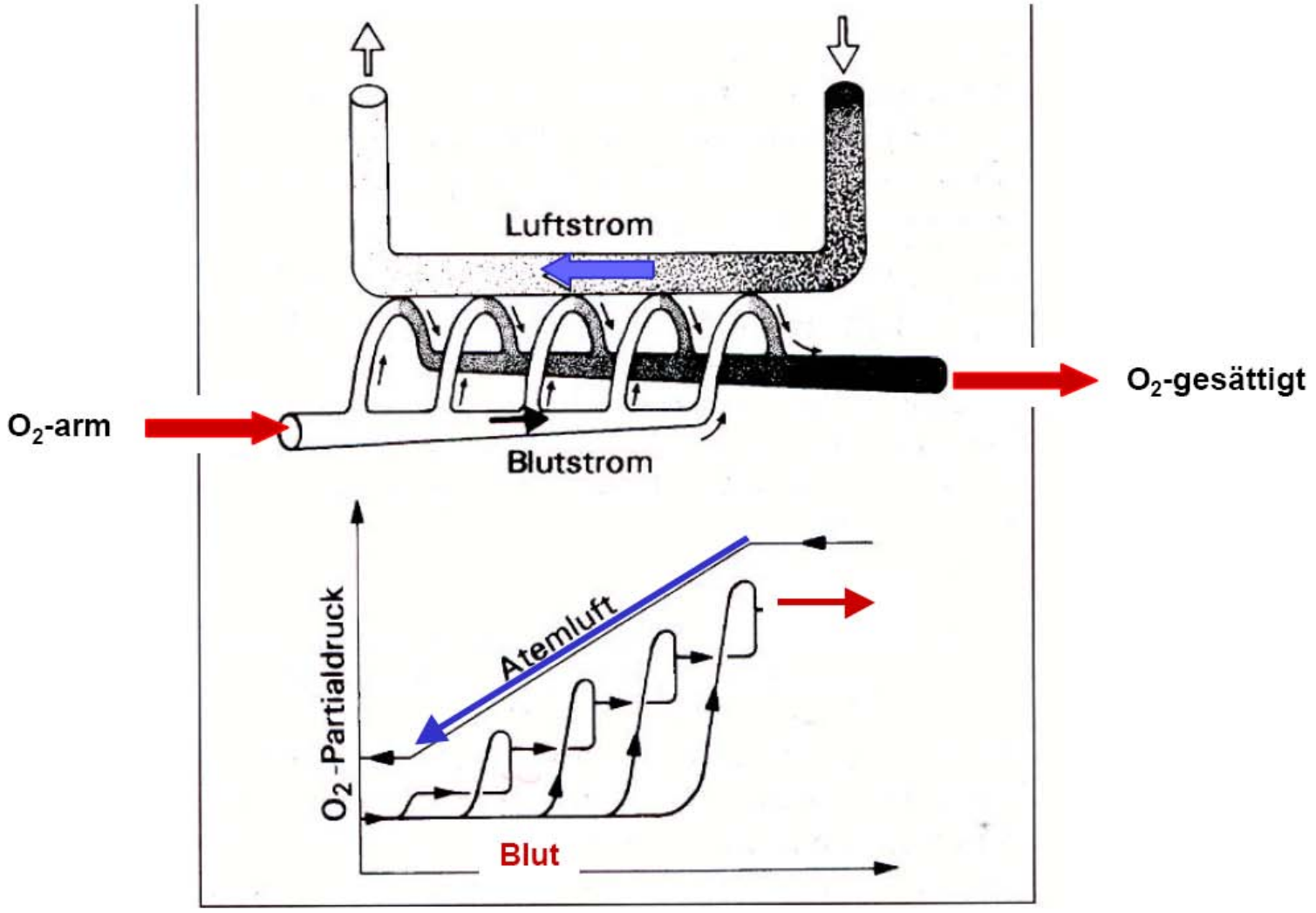
bidirektioneller Luftstrom

unidirektioneller Luftstrom

Eckert

Vogellunge

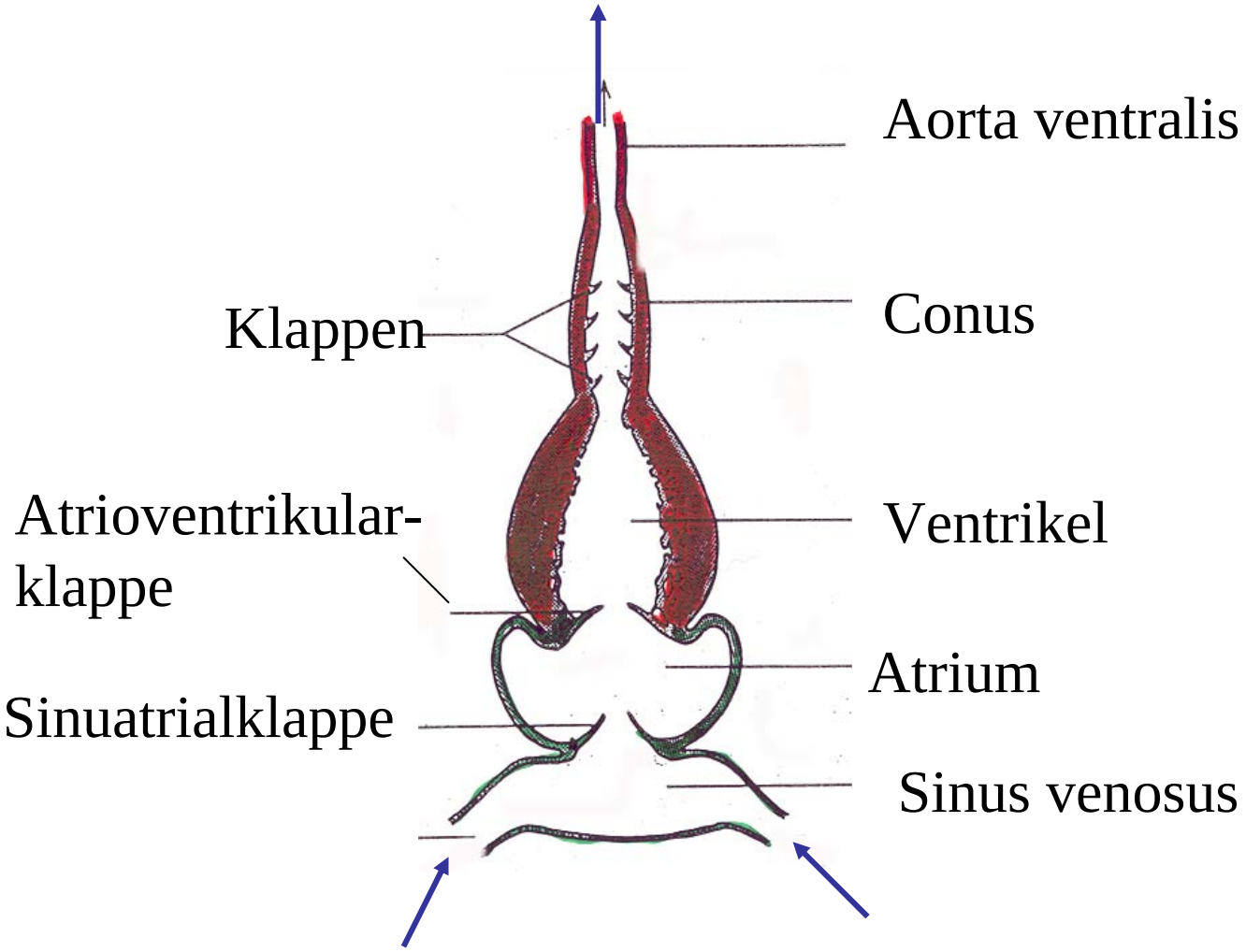
Vogellunge - Kreuzstromprinzip



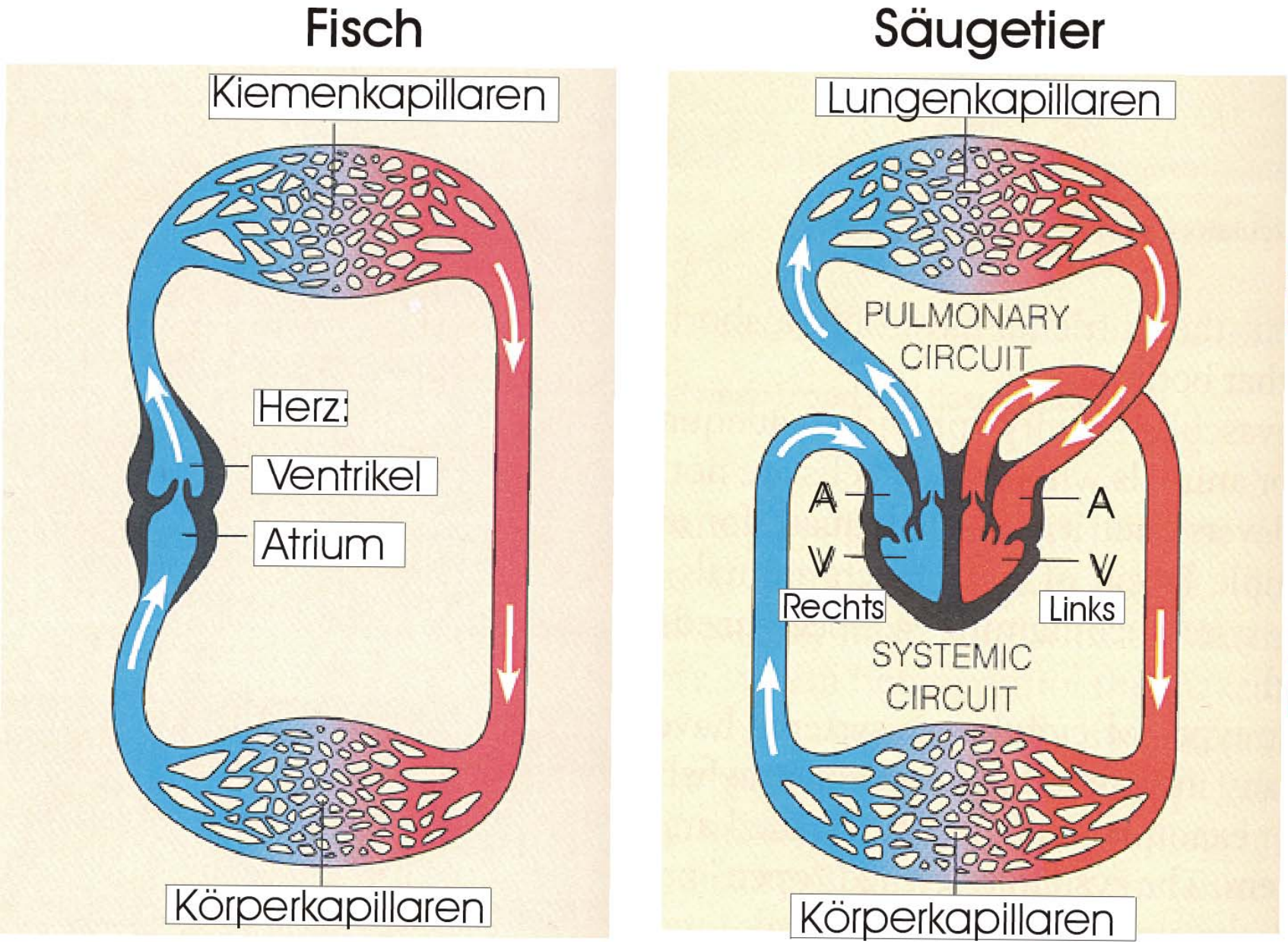
Stufenweise Erhöhung des O_2 Partialdruckes des Blutes

http://www.biologie.uni-regensburg.de/Zoologie/Neumann/pdf/Atmung.pdf

Herz: Fisch


Aorta ventralis
Conus
Klappen
Ventrikel
Atrioventrikular-
klappe
Atrium
Sinuatrialklappe
Sinus venosus

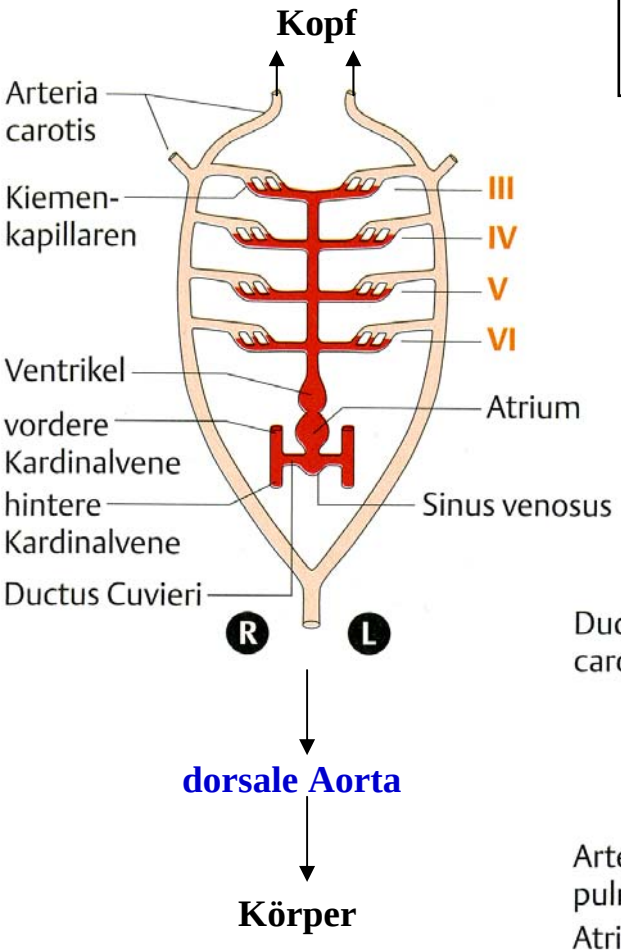
Kreislauf



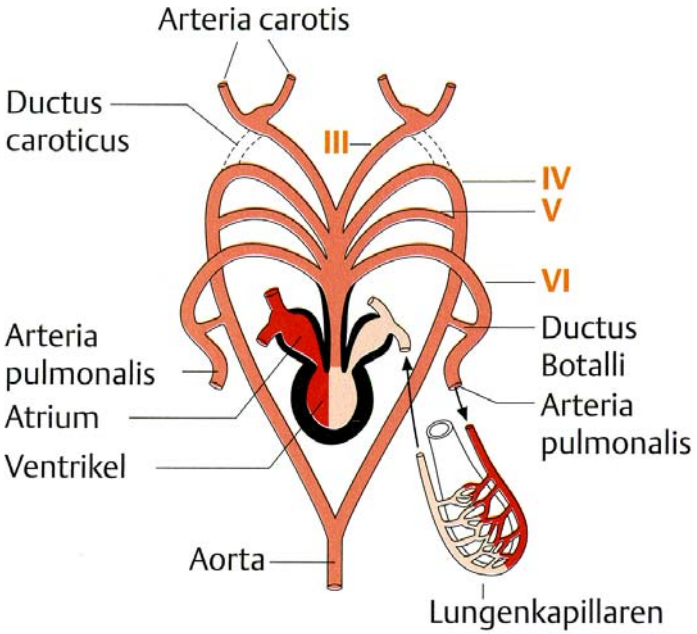
Campbell

Kreislaufsysteme

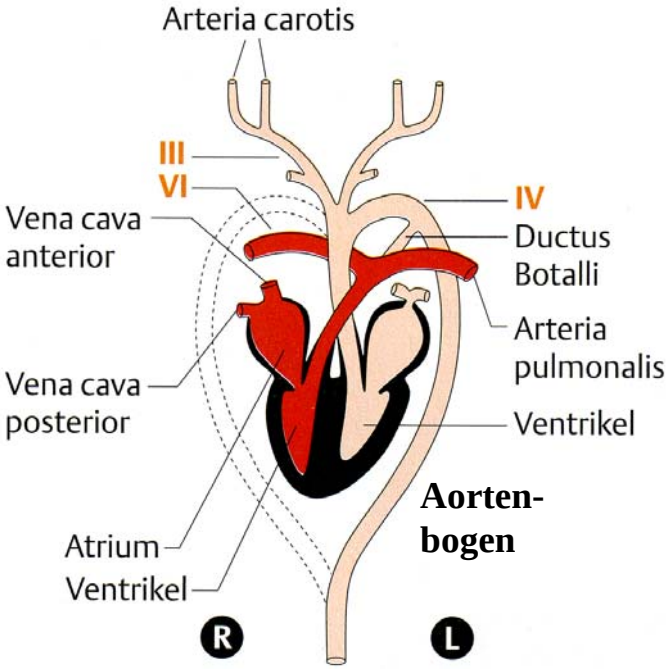
Knochenfisch



adultes Amphib

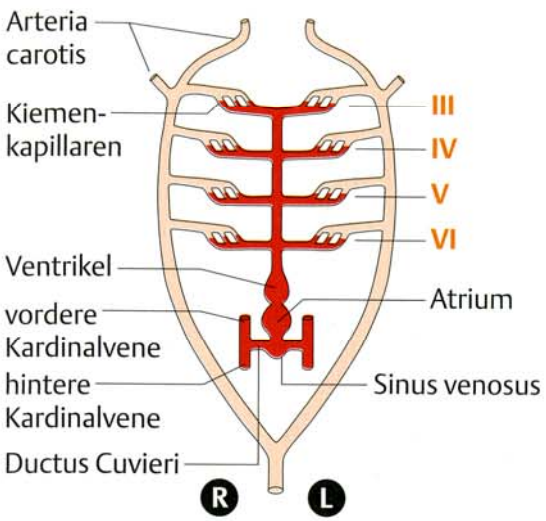


Säuger

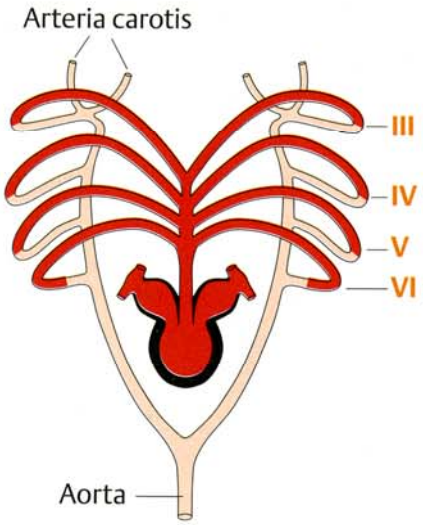


Wehner/Gehring

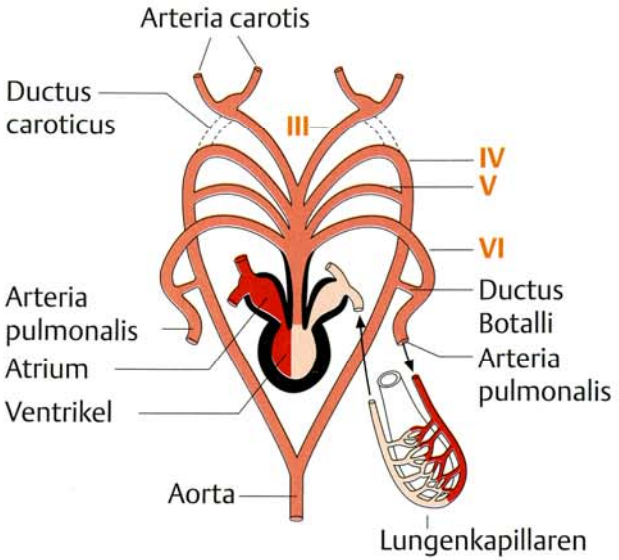
Fisch



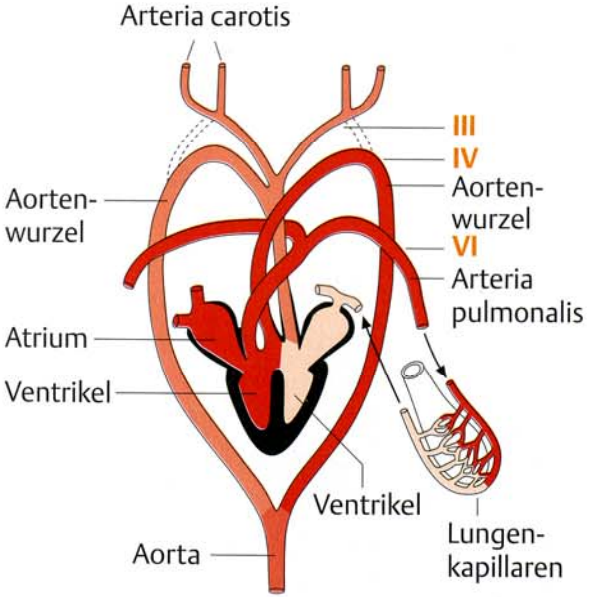
Amphibien-larve



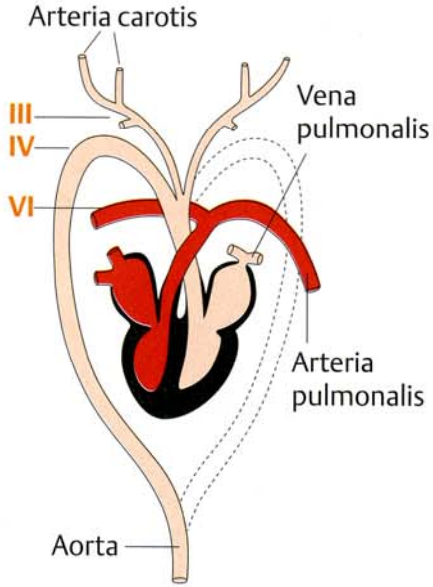
Amphib adult



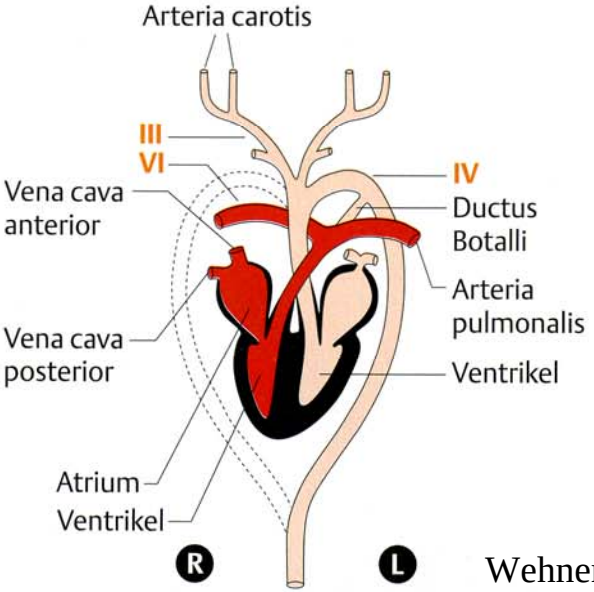
Reptil



Vogel

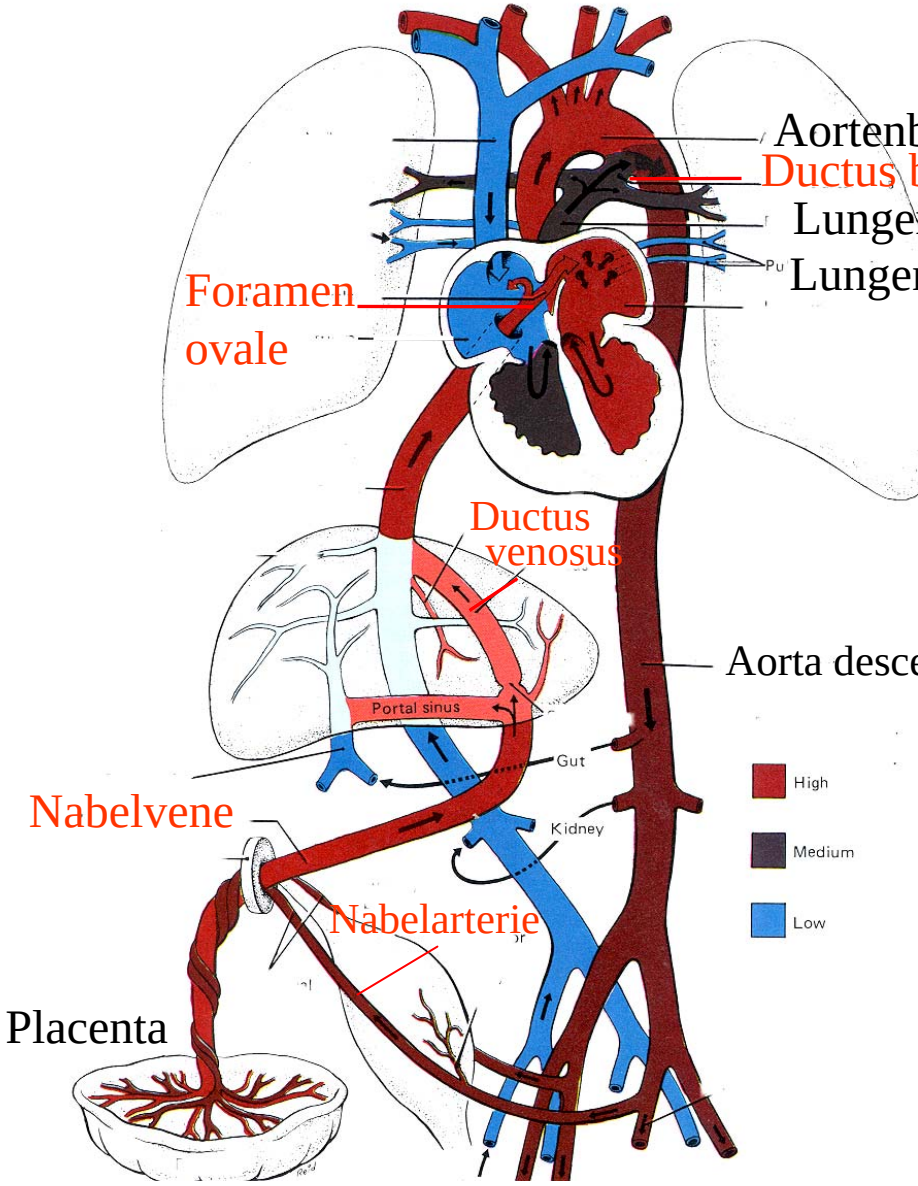


Säuger



Wehner/Gehring

Embryonaler Kreislauf



Nabelvene

⇩

Ductus venosus

⇩

Vena hepatica

⇩

Rechtes Atrium

⇩

Foramen ovale

⇩

Linkes Herz

⇩

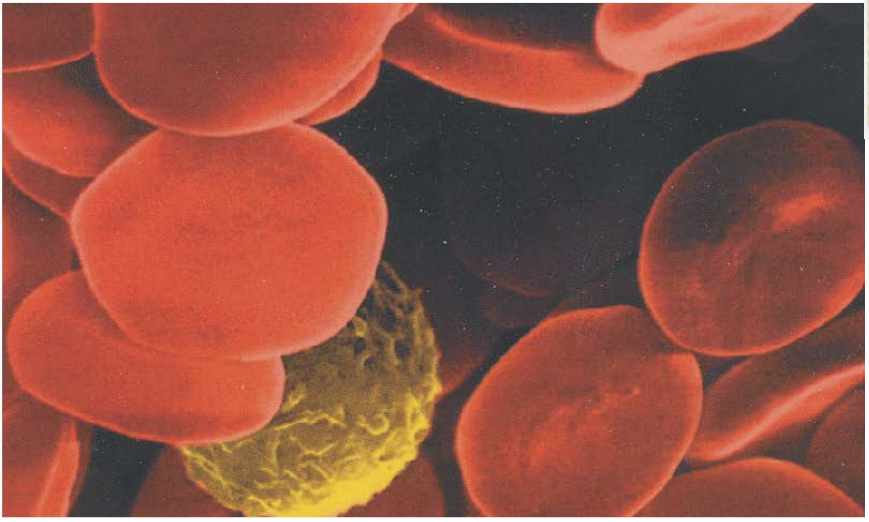
Aorta etc.

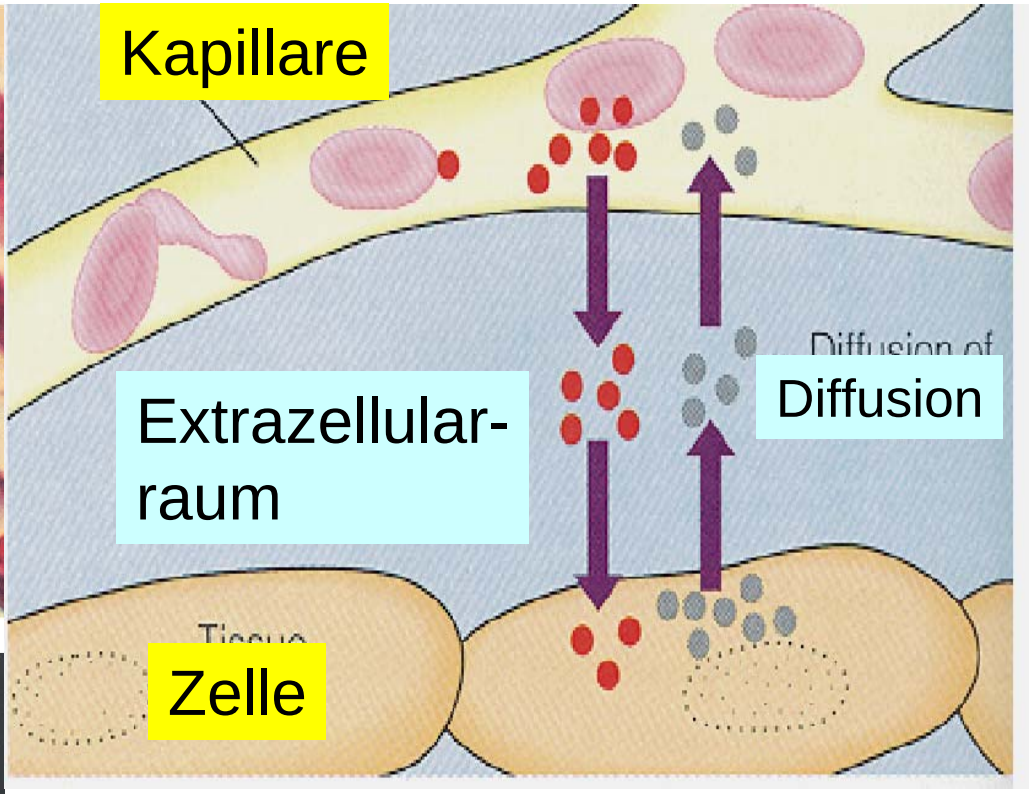
⇩

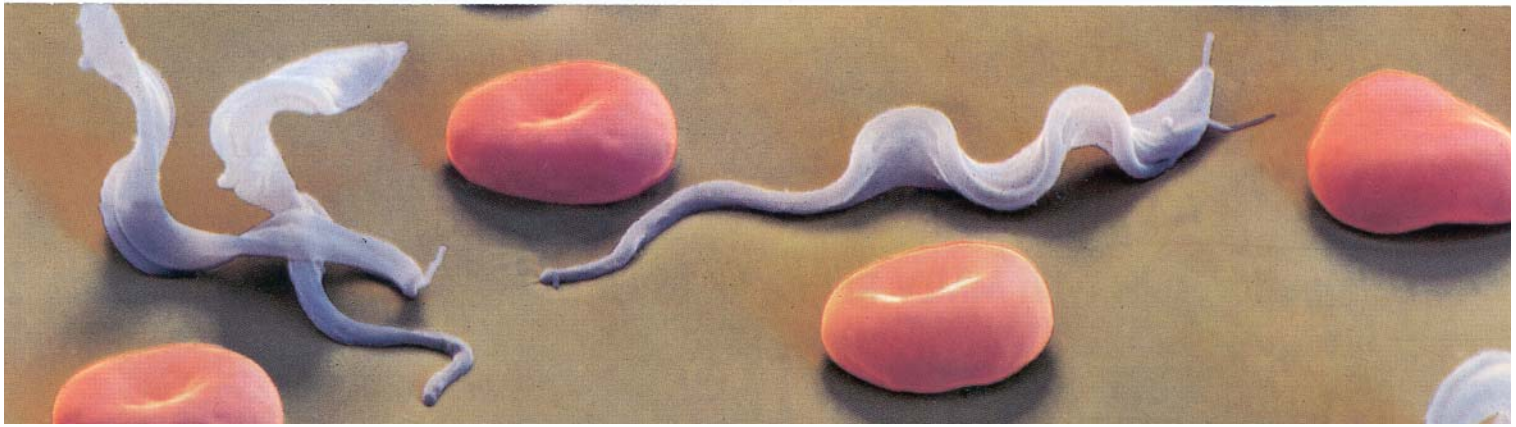
Nabelarterie

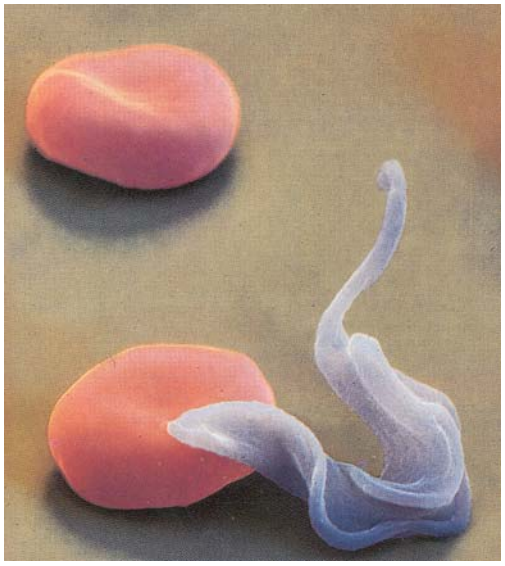
Blut

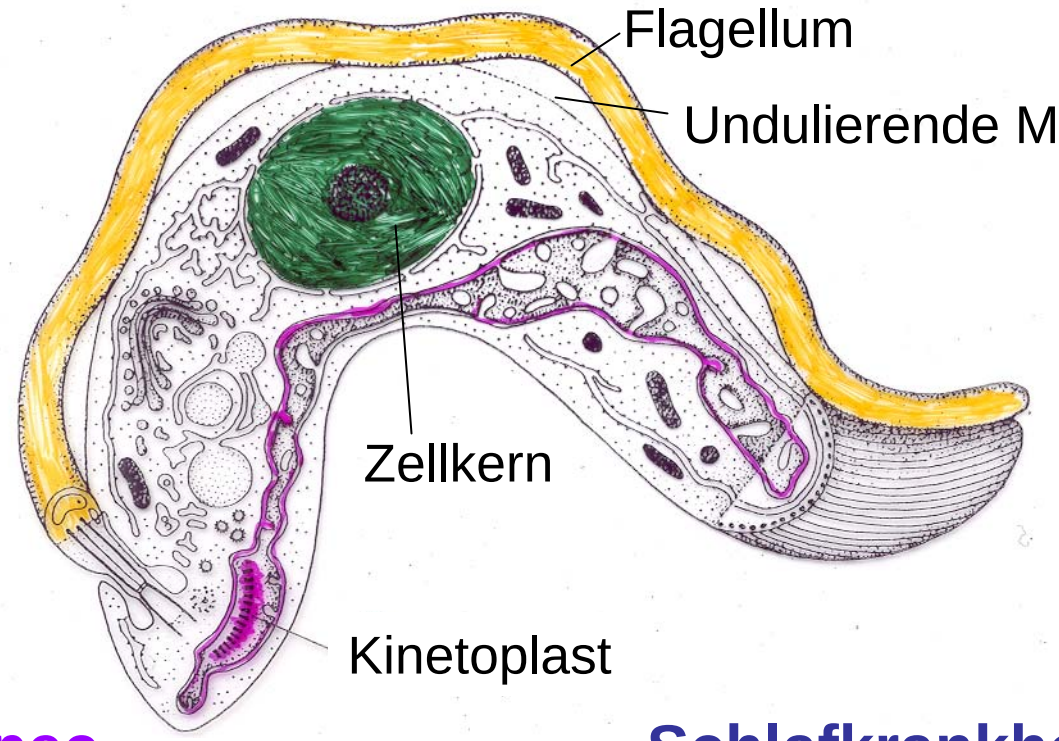
Erythrozyten der Säugetiere









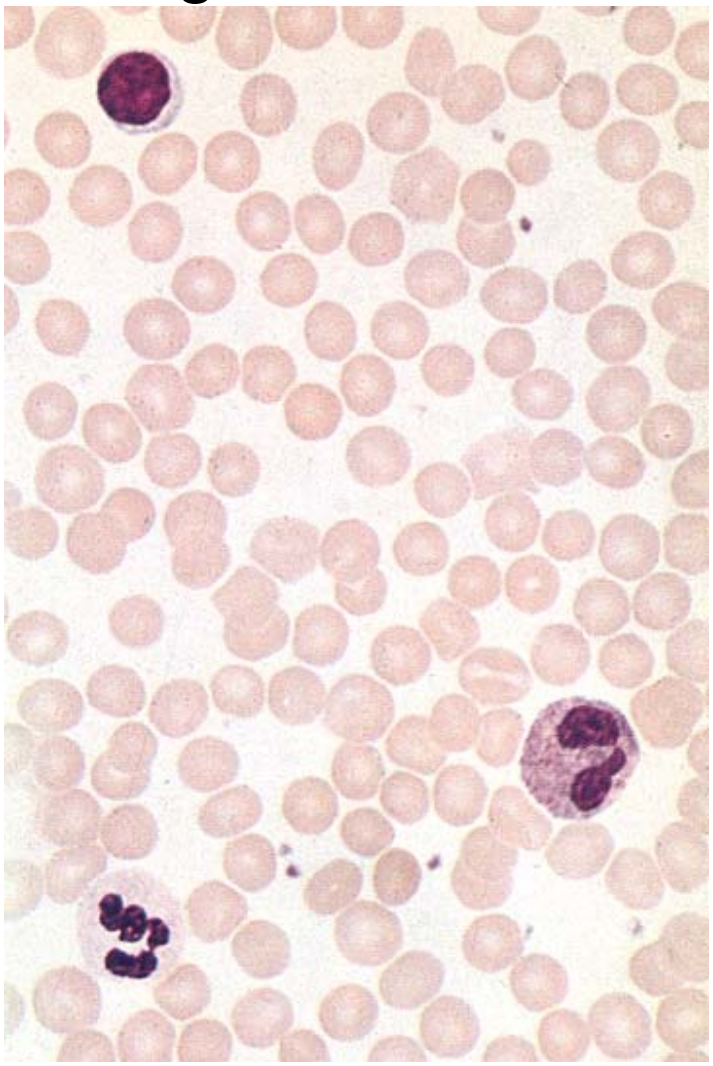


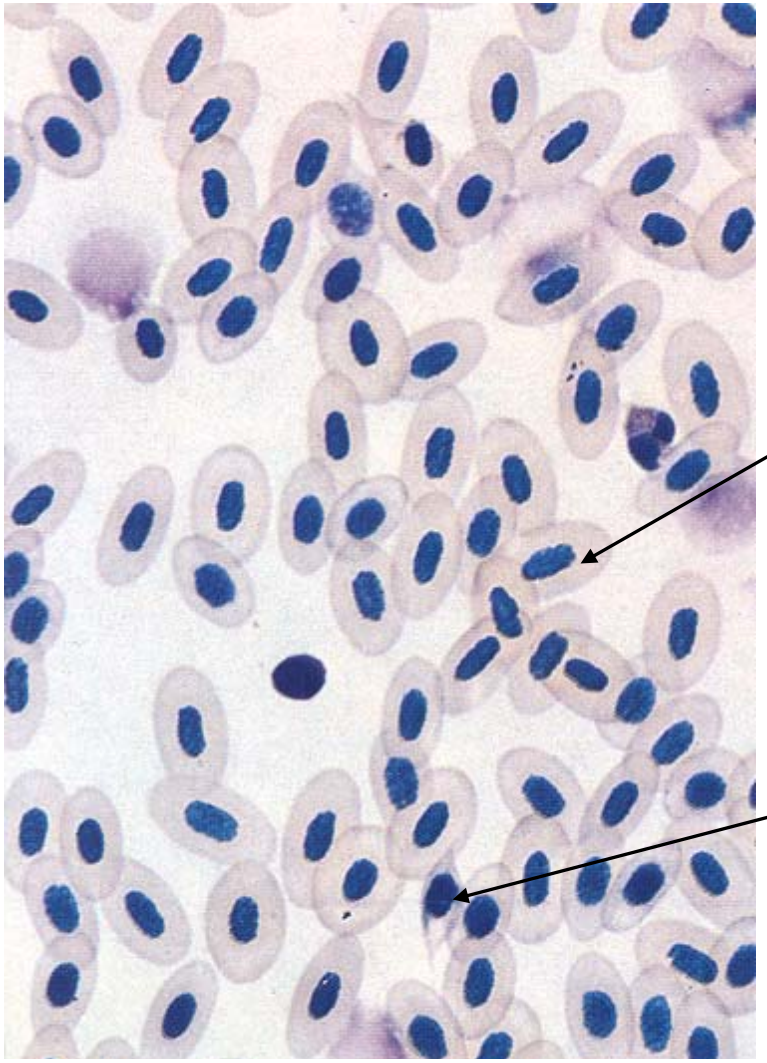
Trypanosoma spec.

Schlafkrankheit

Säugetierblut

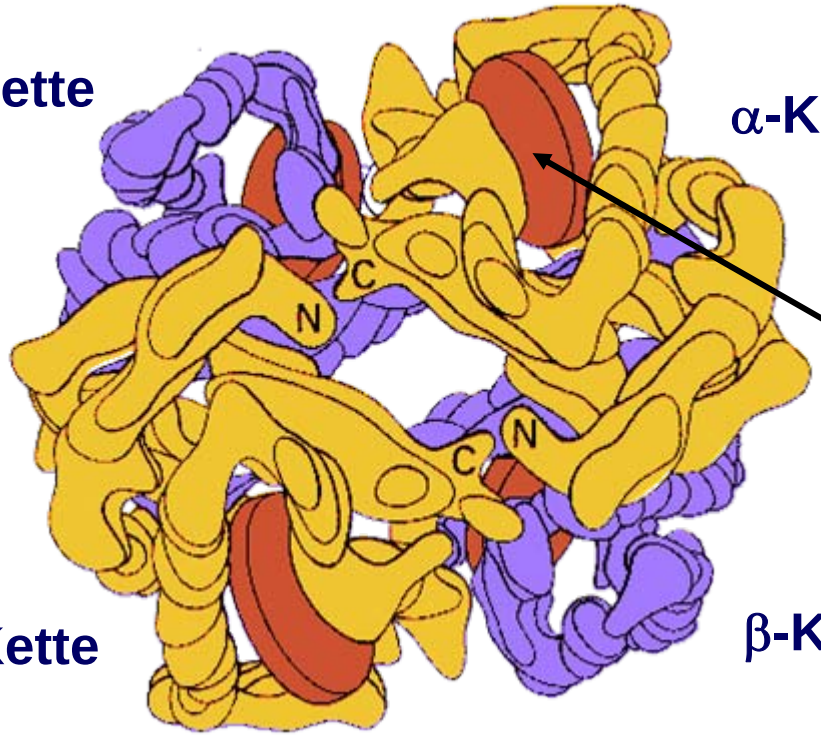
Froschblut

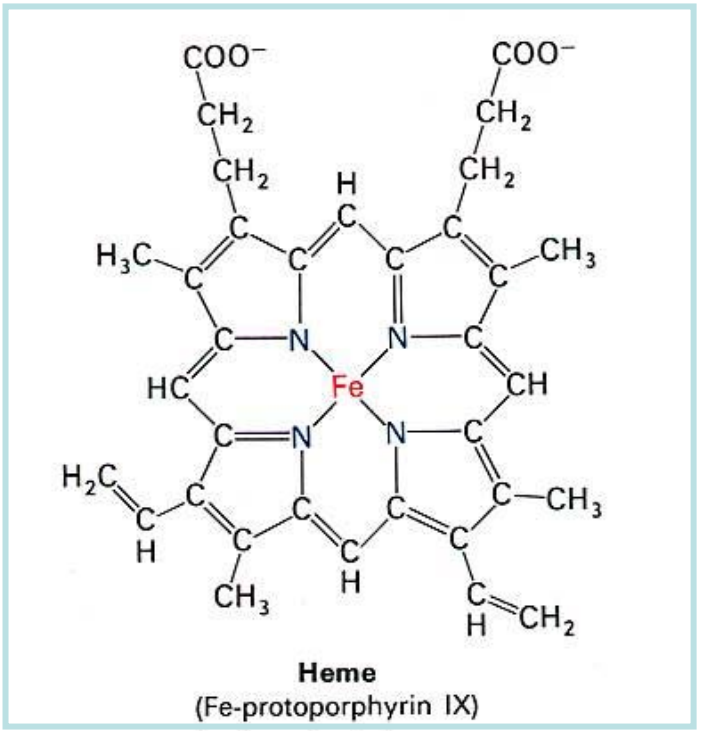




Nur die (reifen) Erythozyten der Säugetiere sind kernlos, die Erythrozyten der übrigen Wirbeltiere (Fisch, Amphib, Reptil, Vogel) besitzen einen Zellkern.
Alle Nichtsäuger besitzen echte Thrombozyten (Spindelzellen); Säugetiere haben Blut-Plättchen (kernlose Plasmastücke).

Hämoglobin

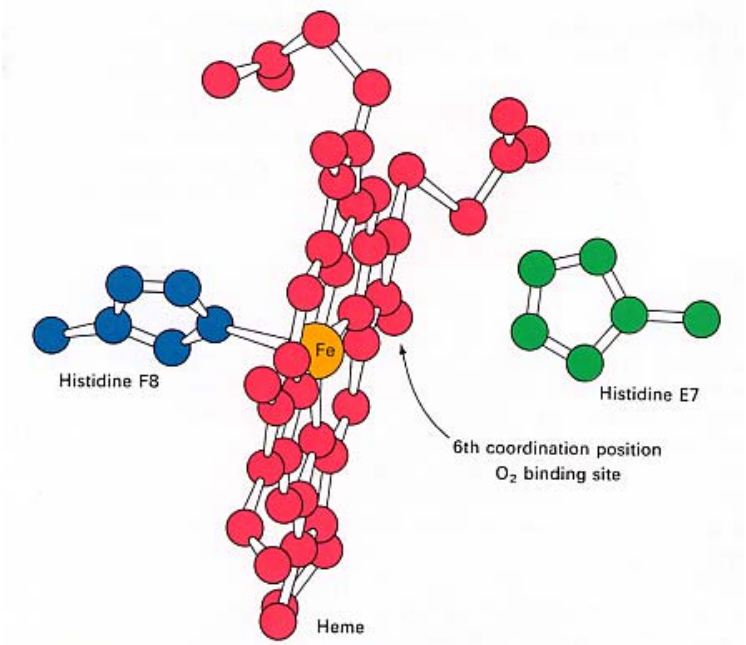


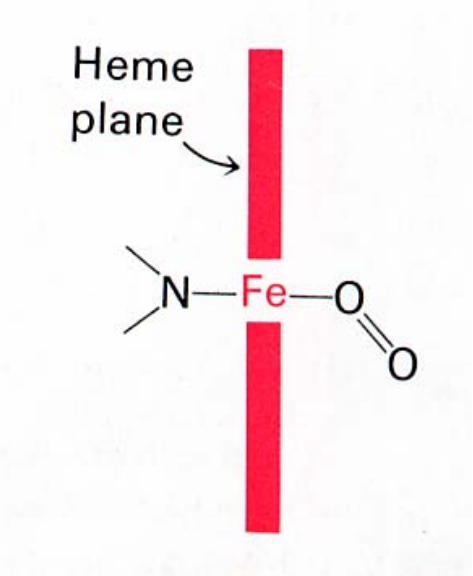


prosthetische Gruppe

Stryer

Bindung von O_2 an Häm





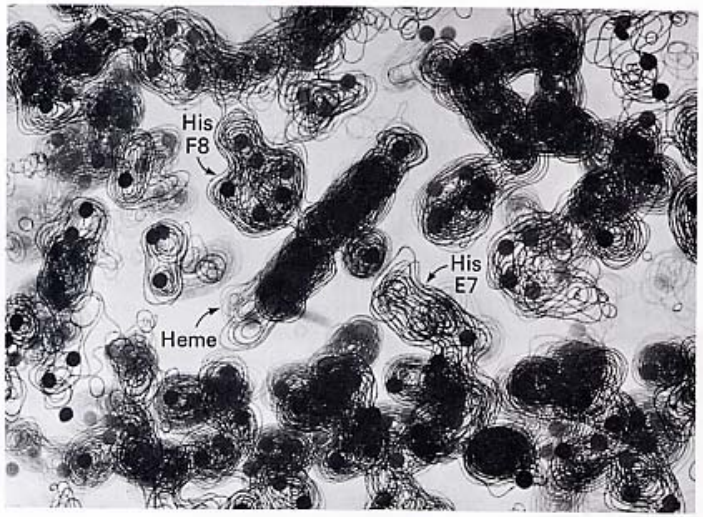
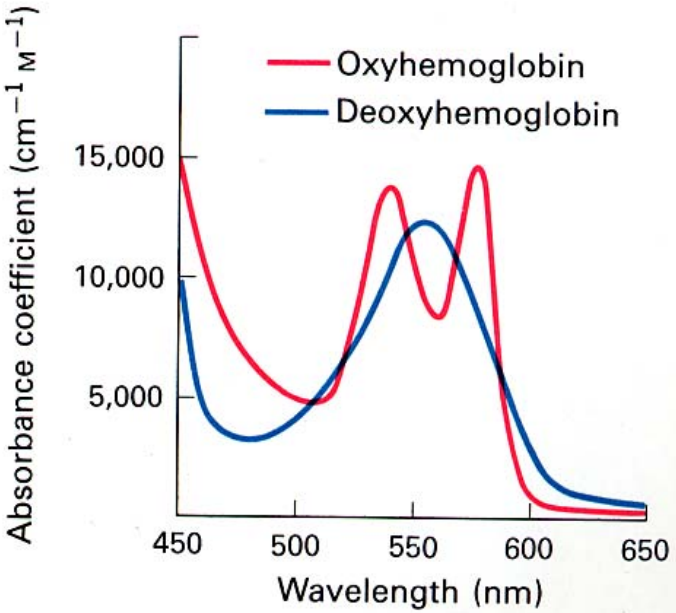
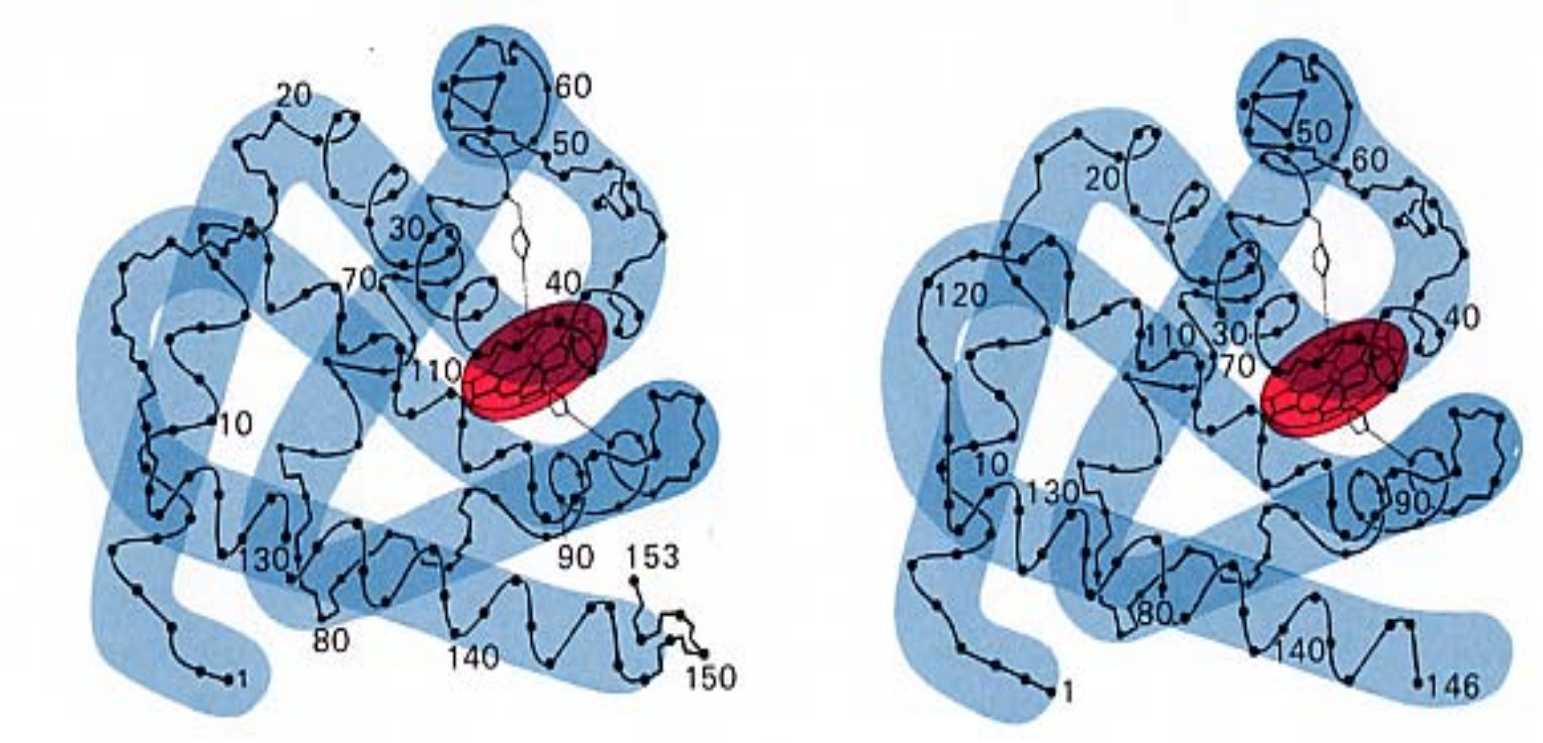


Figure 7-9
Section of an electron-density map of myoglobin near the oxygen-binding site. Electron density extending across the lower part of the map is the E helix. [Courtesy of Dr. John Kendrew.]



Stryer

Myoglobinstruktur

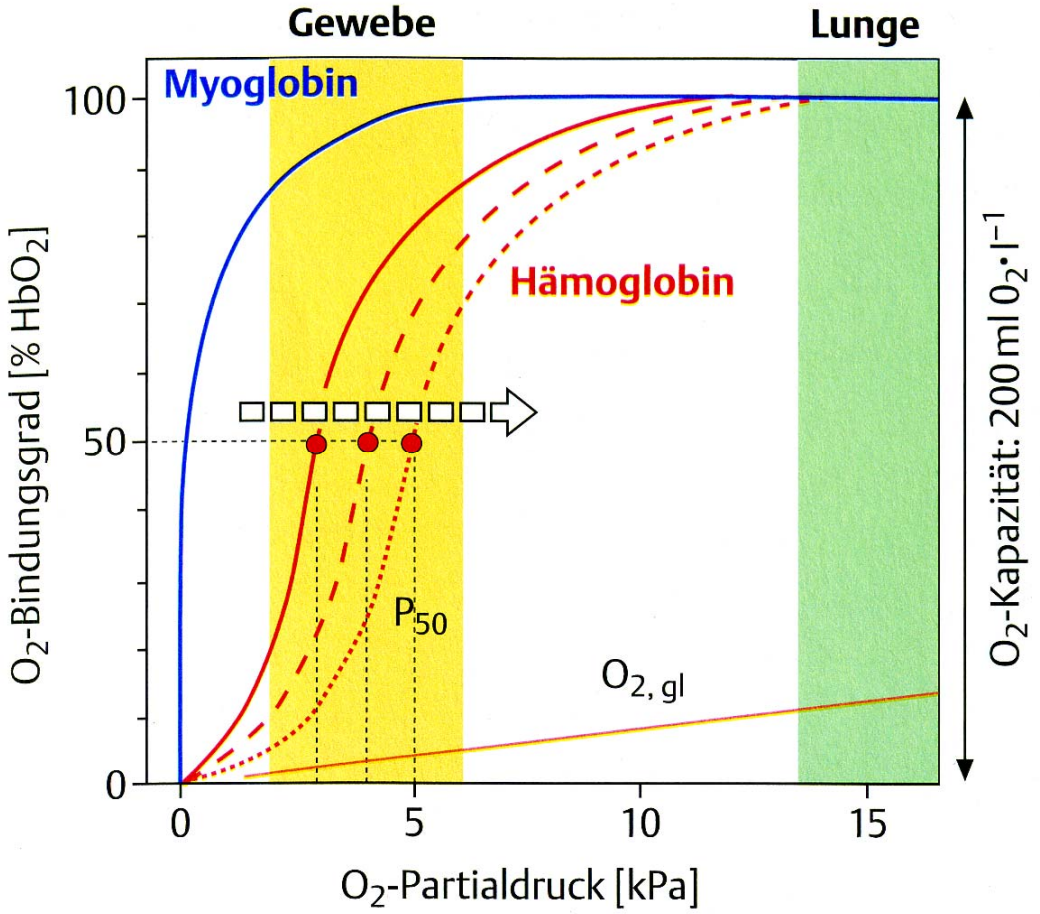


Myoglobin

β-Kette Hämoglobin

Stryer

O_2-Bindungskurve von Hämoglobin



P_{50}= Halbsättigungsdruck

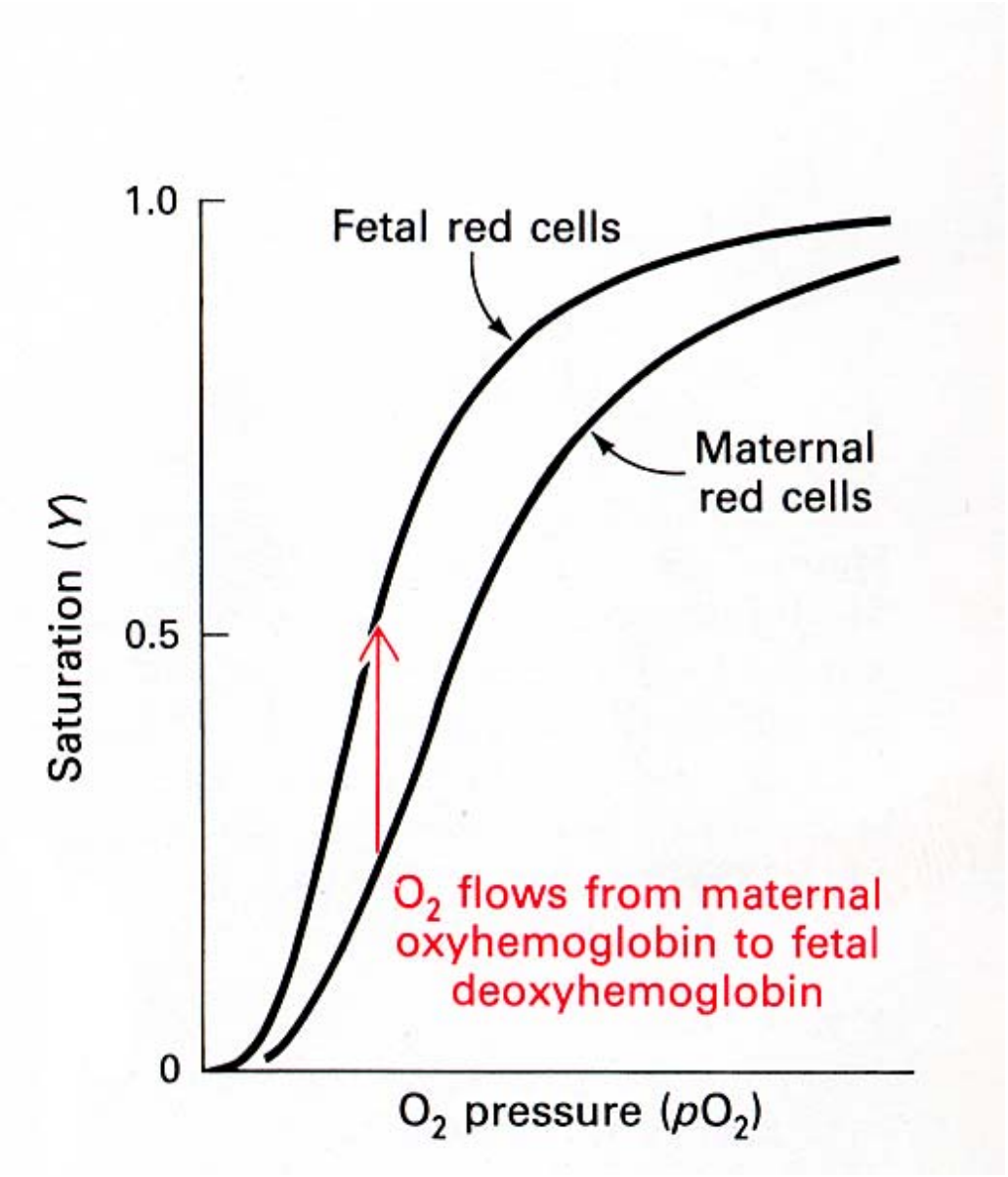
d.h. der O2-Partialdruck, bei dem Hb-lösung zu 50% gesättigt ist.

Maß für O2-Bindungs-Fähigkeit (Affinität)

Hoher P_{50}: geringe Affinität
Kleiner P_{50}: hohe Affinität

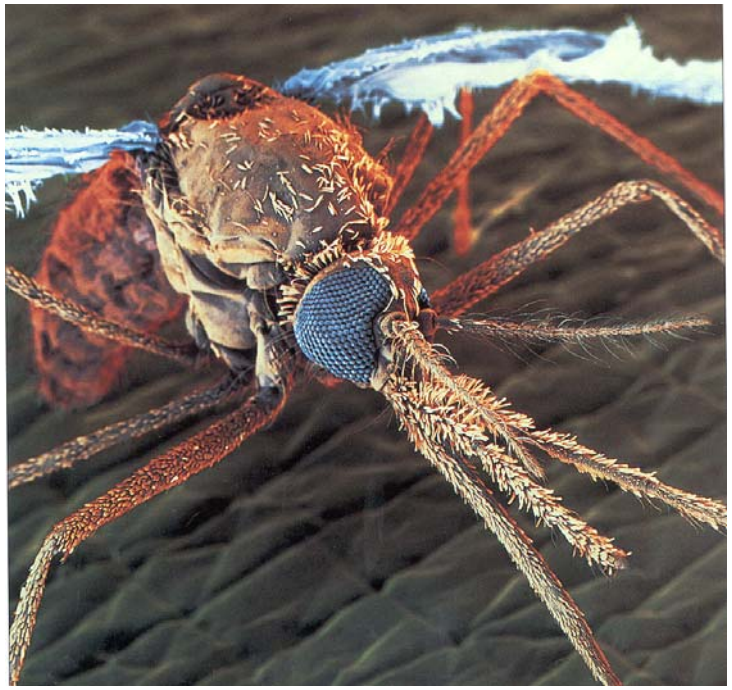
Wehner/Gehring

Foetales Hämoglobin saugt O_2 an

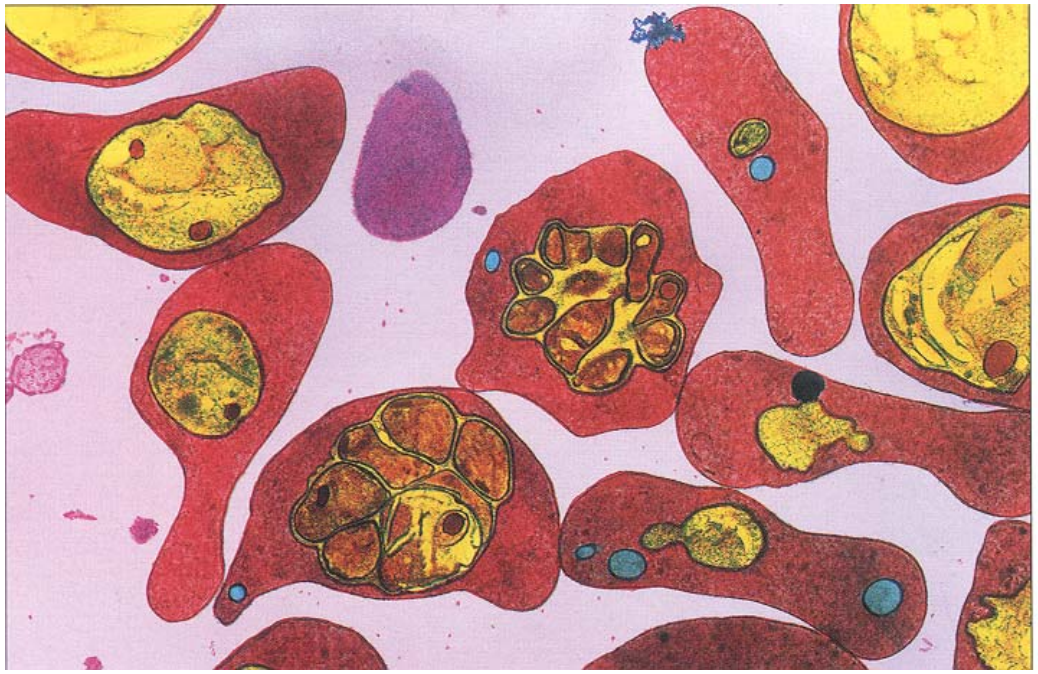


Stryer

Sporozoa: Plasmodium spec. (Malariaerreger)

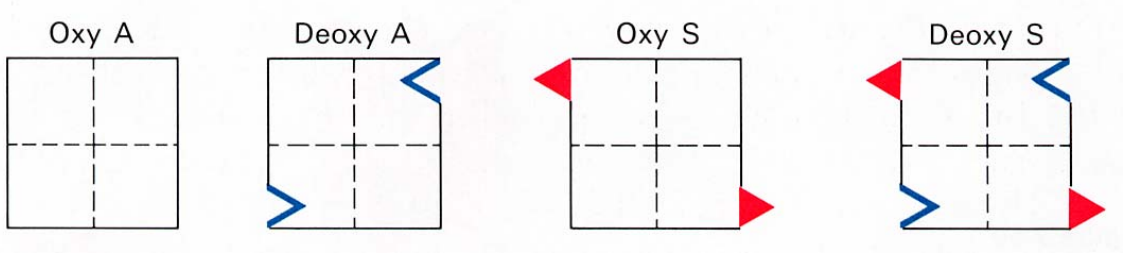


Zwischenwirt: Anopheles



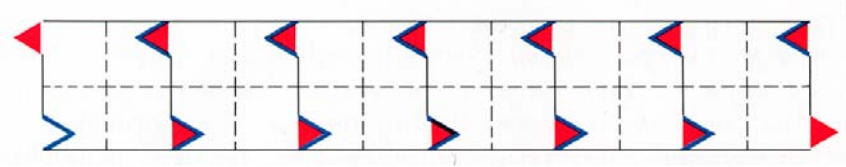
befallene Erythrozyten (Schizontenstadium)

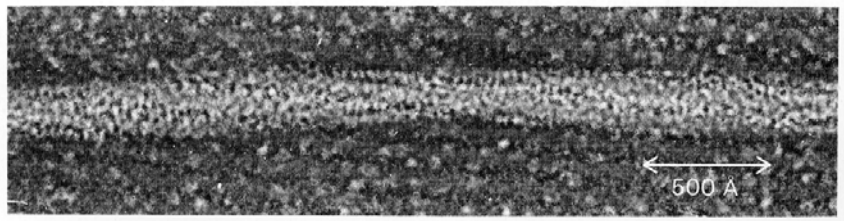
Sichelzellen Anämie



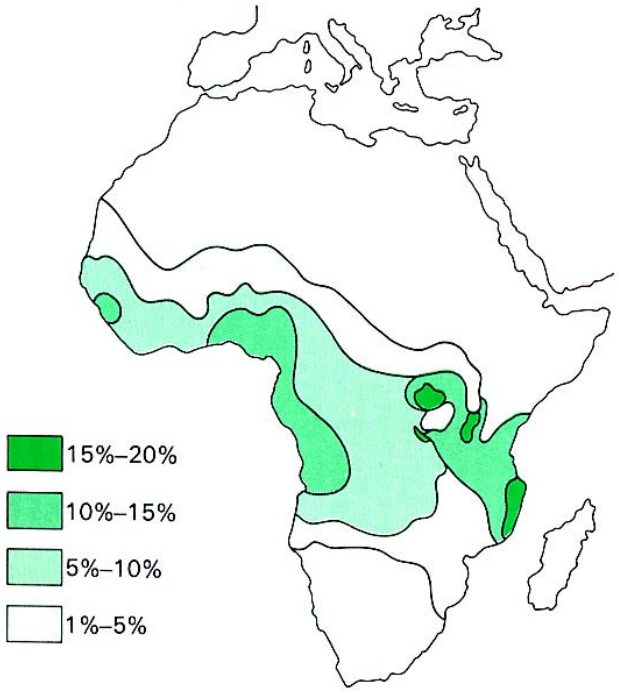
Heterozygote sind vor Malaria geschützt und haben kaum Sichelzellsymptome

Aminosäure 6 in der β-Kette val statt glu
→ „ sticky patch“
→ Bildung langer Ketten von DeoxyS
→ Sichelzellen
→ Erythrozytenbefall und -zerstörung durch Plasmodium ist reduziert





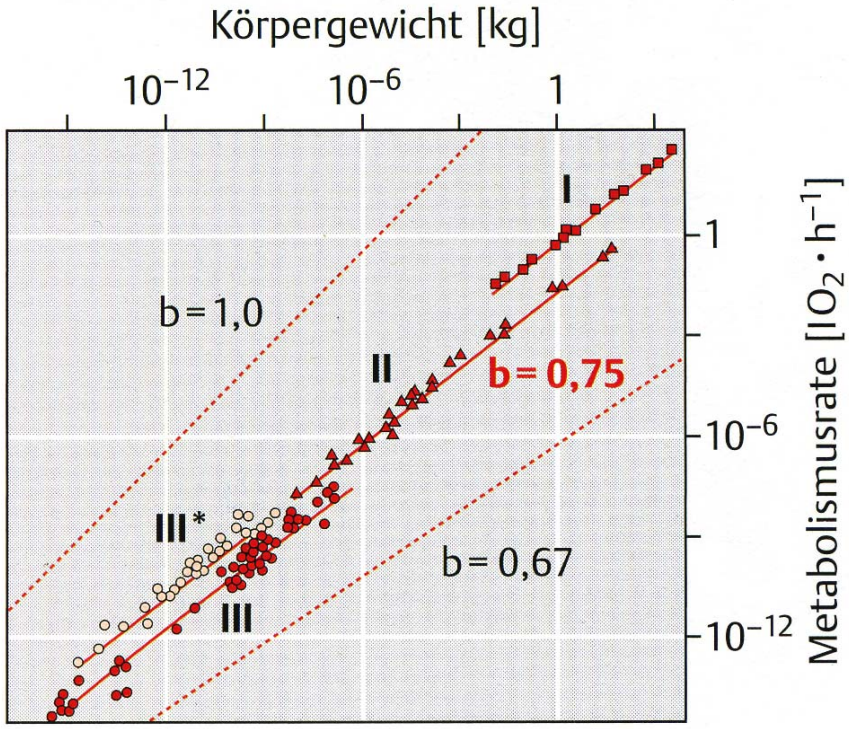
Große Häufigkeit des Sichelzellengens in Gebieten mit hoher Dichte von Anophelesmücken



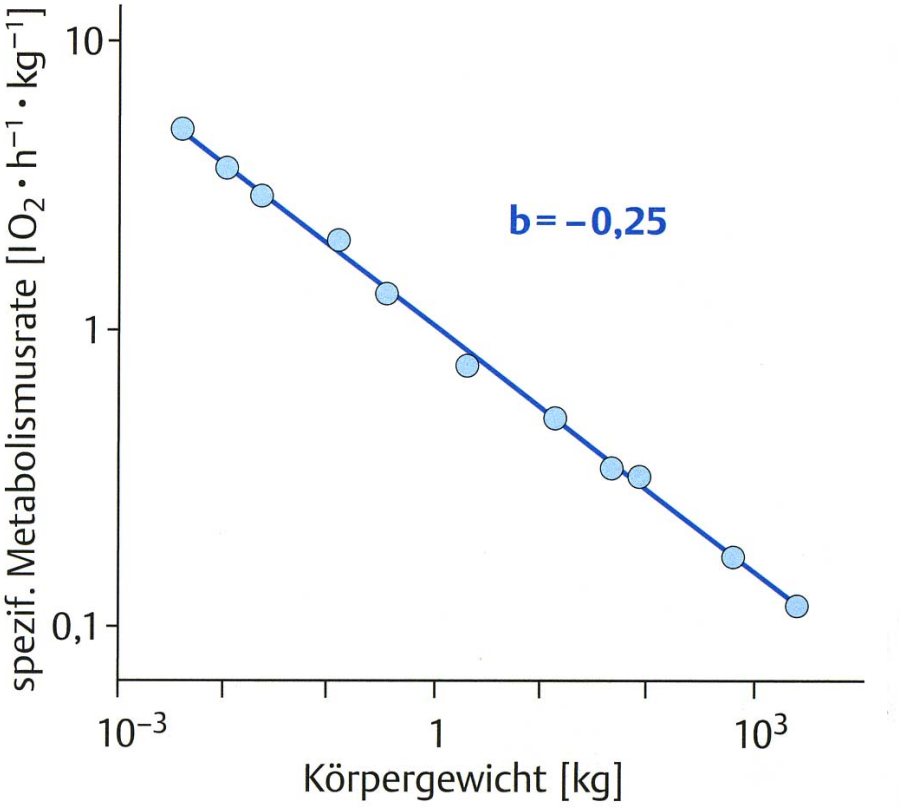
Stryer

O_2-Verbrauch unterschiedlicher Wirbeltiergruppen

I Homoitherme
II Poikilotherme
III Einzeller *in Zellteilung

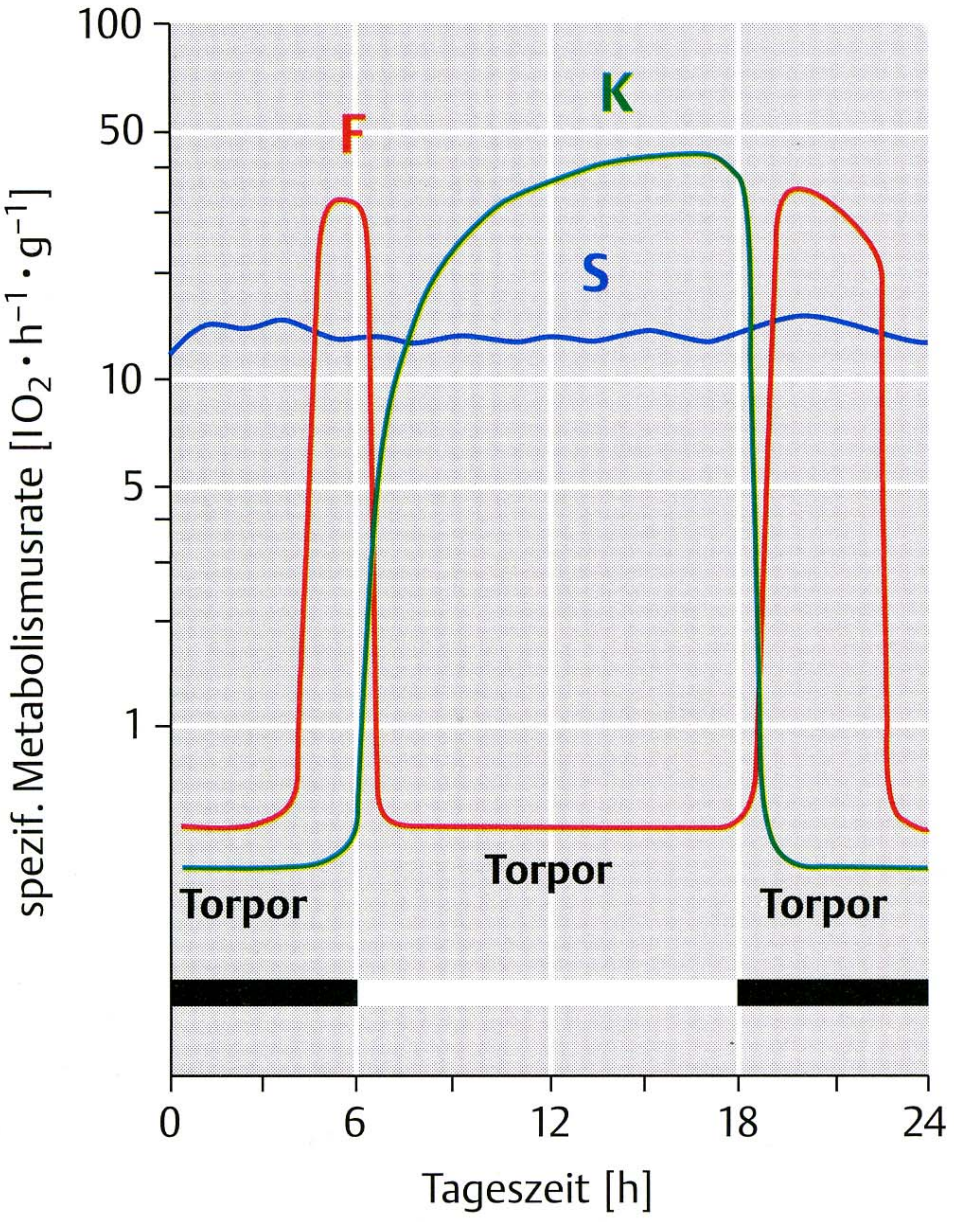


Säuger



Wehner/Gehring

Torpor



Fledermäuse
Spitzmäuse
Kolibris

Wehner/Gehring