FRACTIONAL SATURATION

Find the fractional saturation for hemoglobin at the oxygen pressure that causes, for myoglobin, 75% of it saturated with oxygen

Assume that for hemoglobin, p50 is 26 torr and the Hill constant is 3. For myoglobin, p50 is 2.8 torr.

① First, find the pO_2 for myoglobin

$$\theta_{(myo)} = \frac{pO_2}{pO_2 + p50_{myo}}$$

$$0.75 = \frac{pO_2}{pO_2 + 2.8}$$

$$0.75(pO_2 + 2.8) = pO_2$$

$$0.75\,pO_2 + 2.1 = pO_2$$

$$2.1 = 0.25\,pO_2$$

$8.4 = pO_2 \rightarrow$ oxygen pressure that causes myo. to be 75% saturated

② Use this pO_2

$$\theta_{(hemo)} = \frac{(pO_2)^n}{(pO_2)^n + (p50_{(hemo)})^n}$$

$$\theta = \frac{(8.4)^3}{(8.4)^3 + (26)^3} = 0.0326 \rightarrow$$ 3.3% hemoglobin is saturated