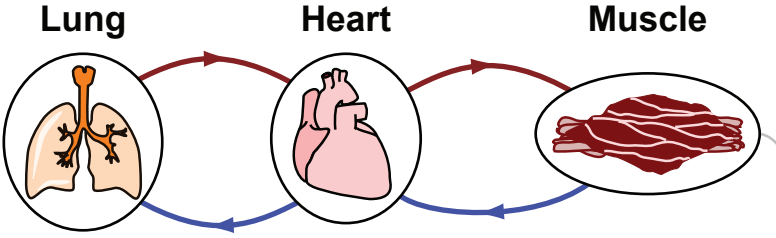
Aerobic Model of Marathon Performance:

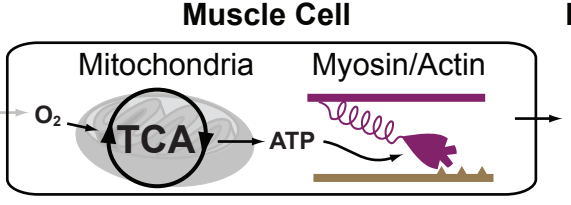
$$v_{marathon}(\mathrm{m\cdot s^{-1}}) = \mathbf{VO_{2MAX}}(\mathrm{mol\cdot s^{-1}}) \times \boldsymbol{RE}(\mathrm{m\cdot mol^{-1}}) \times LT$$

Oxygen Transport Factors ($\mathbf{VO_{2\ MAX}}$)



$$\frac{[O_2]^{lung} \times [Heme]_t}{K_{Heme} + [O_2]^{lung}} \times V_{stroke} \times HR_{MAX} \times \frac{[Myo]}{K_{myo}\left(\frac{[Heme]}{K_{heme}}\right) + [Myo]}$$

Running Economy Factors (*RE*)



× 3ATP/O_2 × 10 joules Work / ATP (20% efficiency) × meters / joule