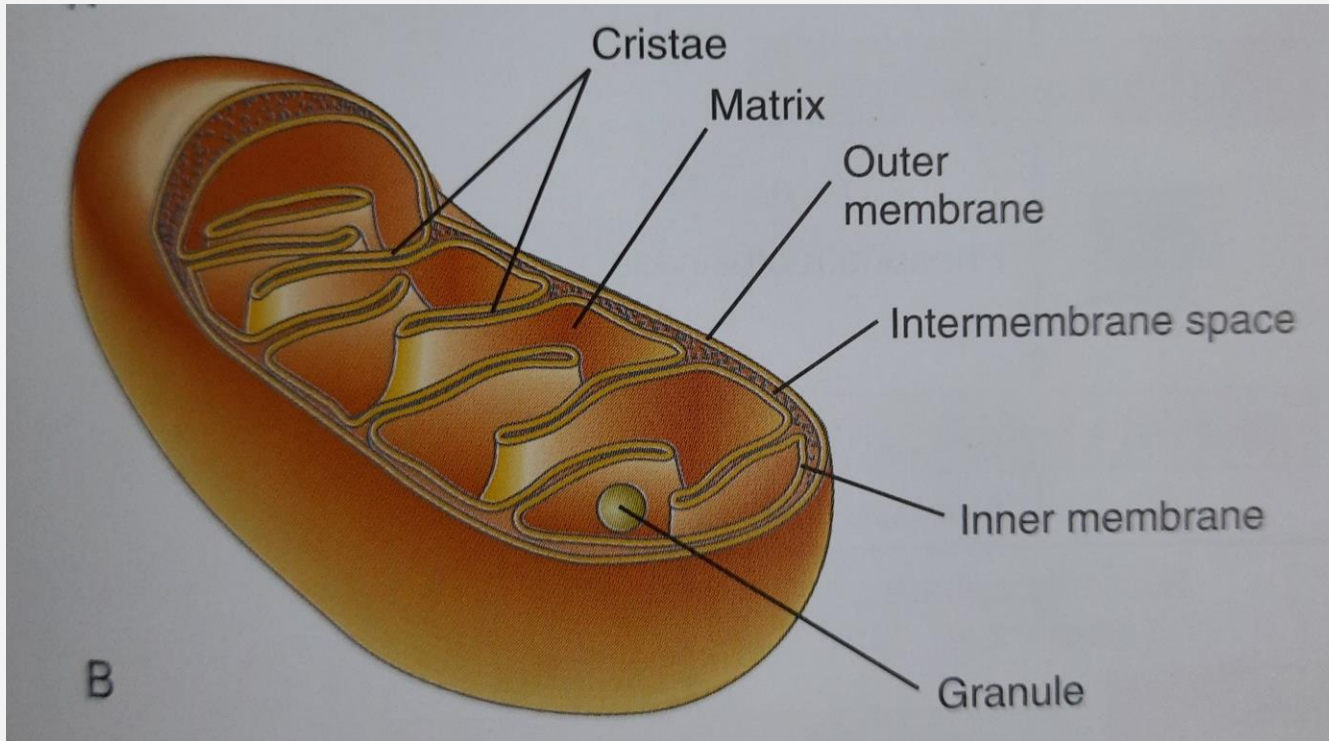
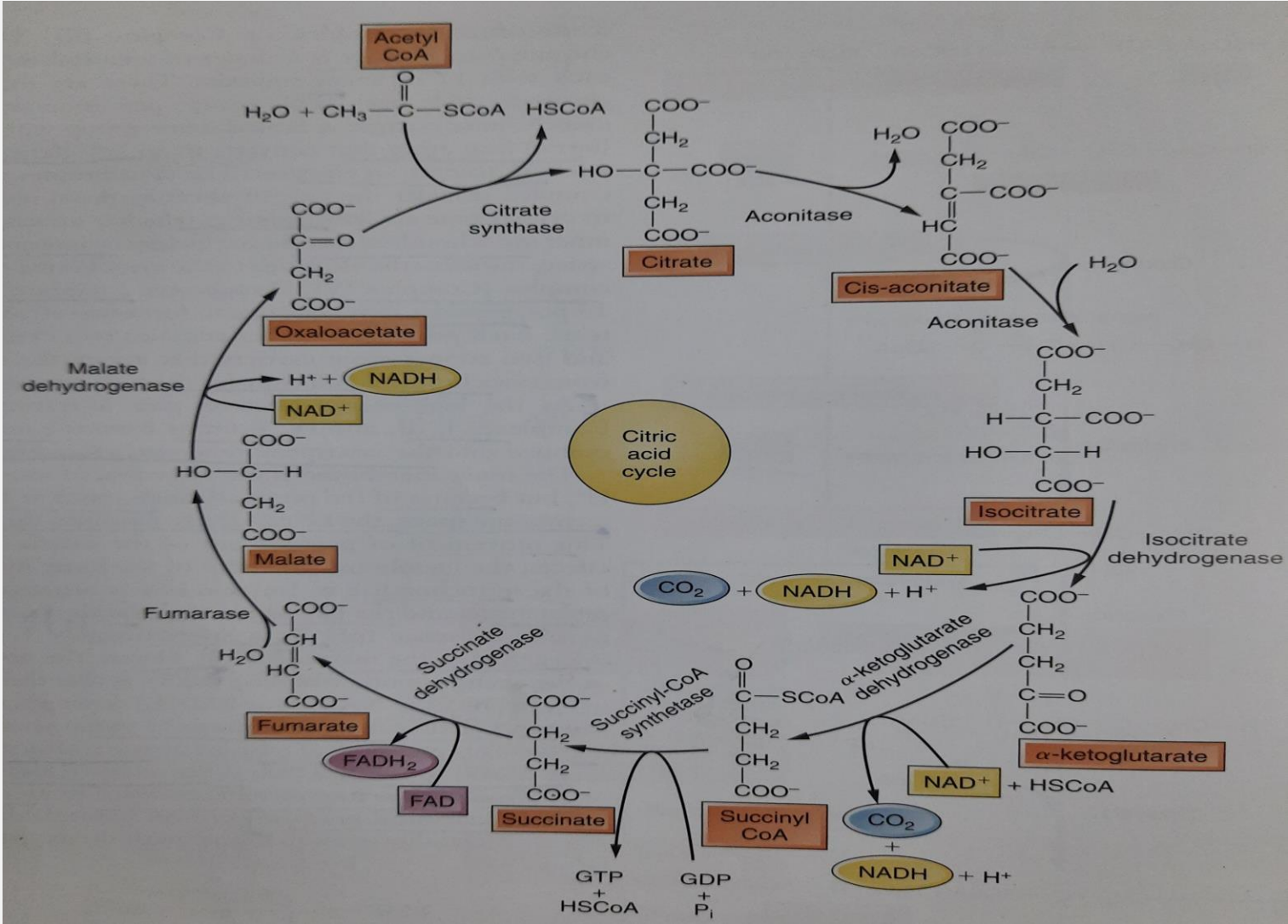


**MITOCHONDRIA**

- Double membrane cellular organelle
- Outer & inner membranes ( more surface areas due to cristae), matrix, inter membrane space
- Oxidative breakdown of glucose & fatty acids; electron transport chain & ATP synthesis
- Permeable outer membrane due to Porins; impermeable inner membrane

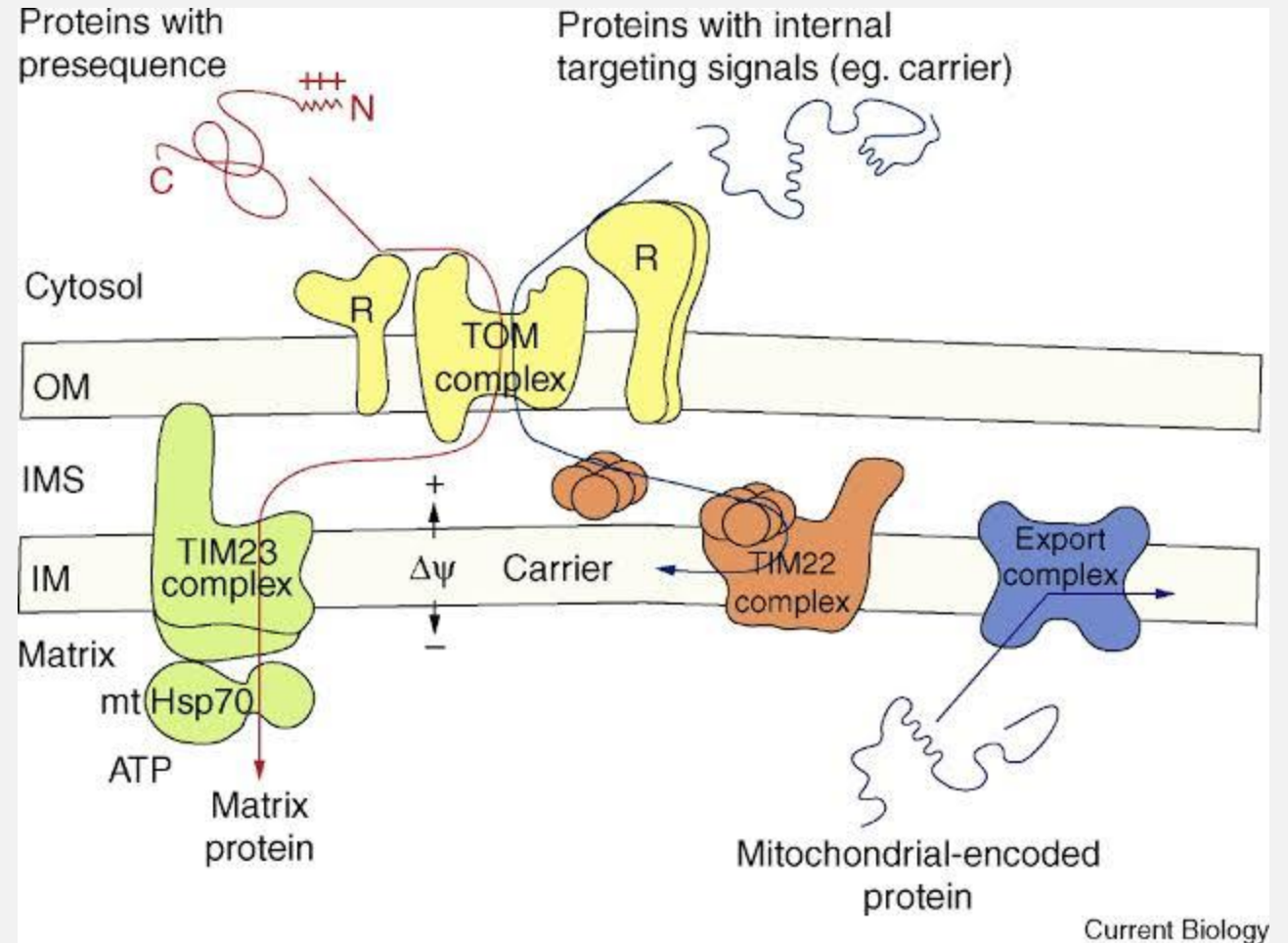


# CITRIC ACID CYCLE

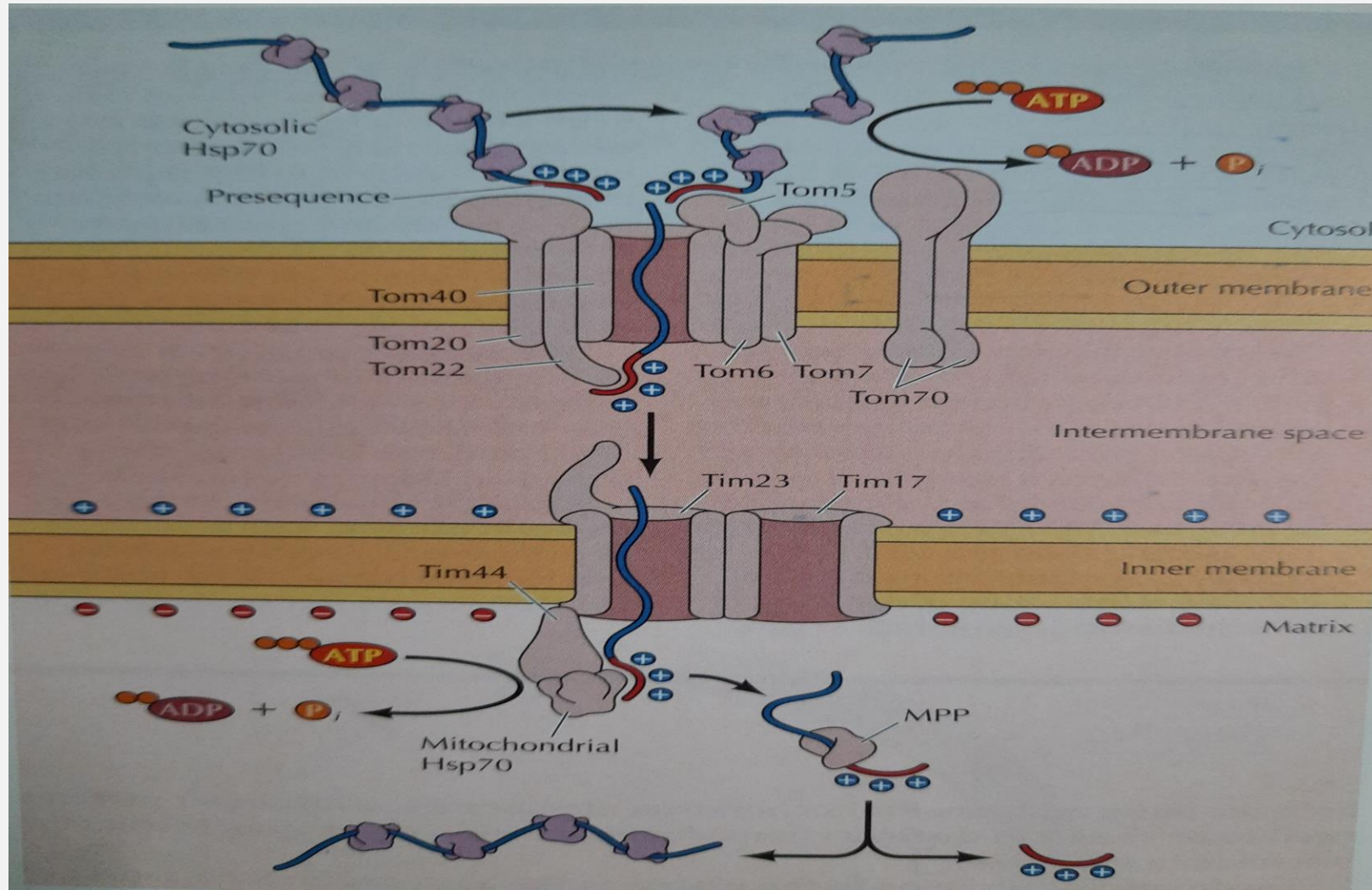


# PROTEIN IMPORT SYSTEM

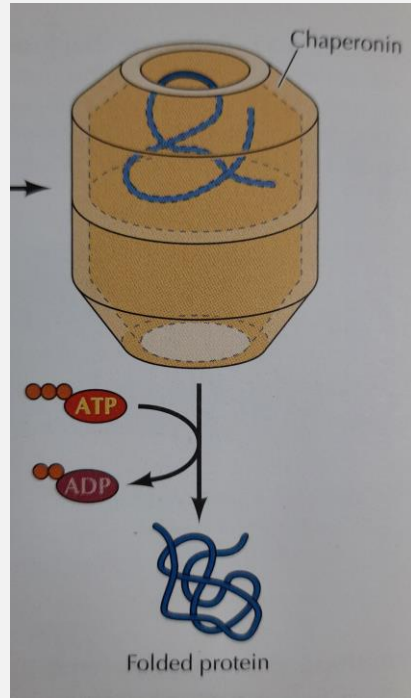
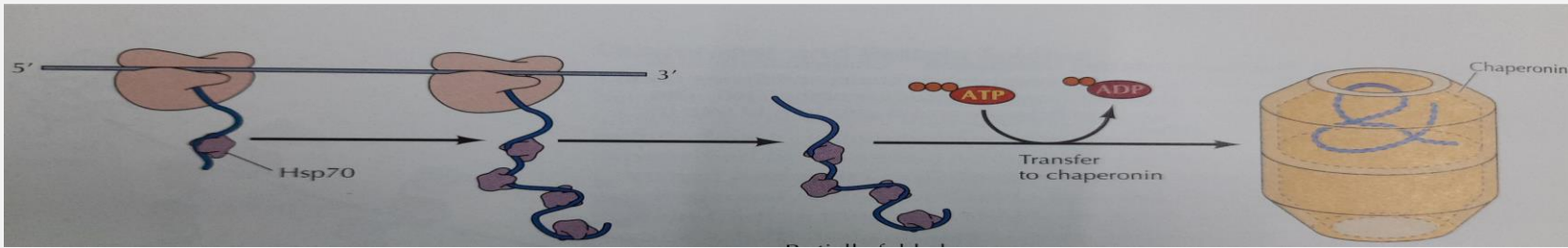
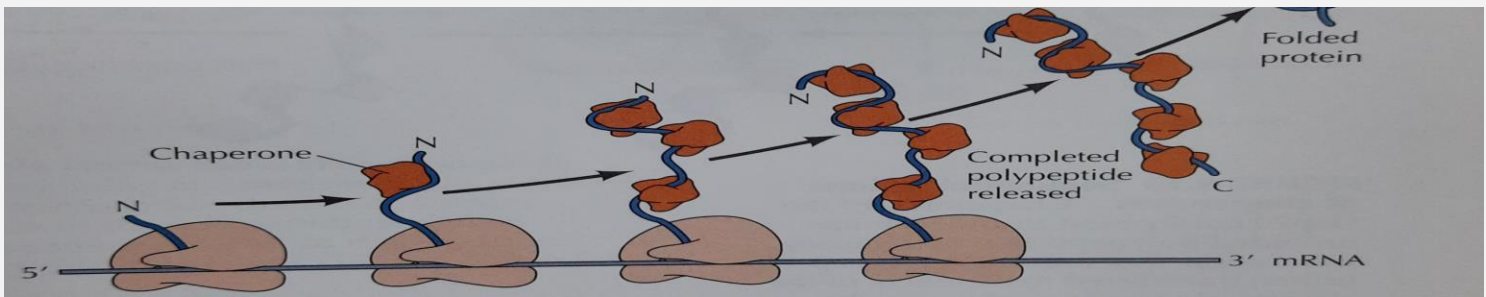
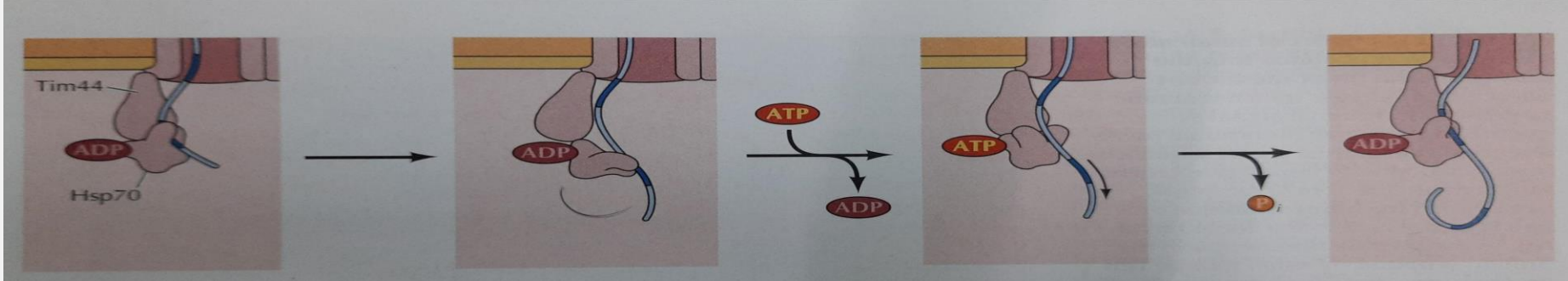
- Why mitochondria needs import?
- Presequences or internal sequences?
- Chaperone & Chaperonin (Heat Shock Proteins)
- TOM & TIM complexes
- Matrix Processing Peptidase (MPP)
- Second sorting signal & Exporter proteins (Oxa I)



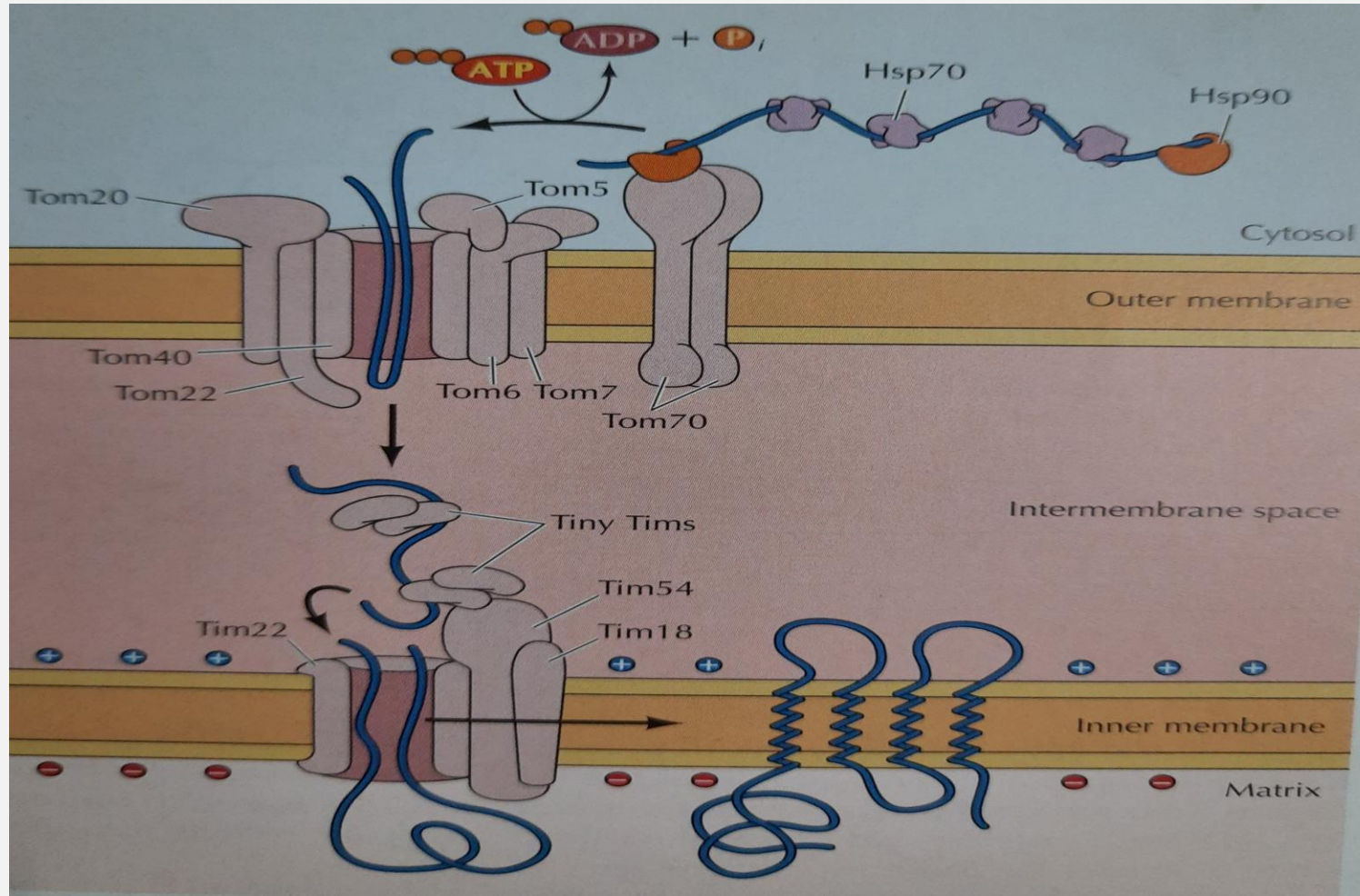
# IMPORT OF MITOCHONDRIAL MATRIX PROTEINS



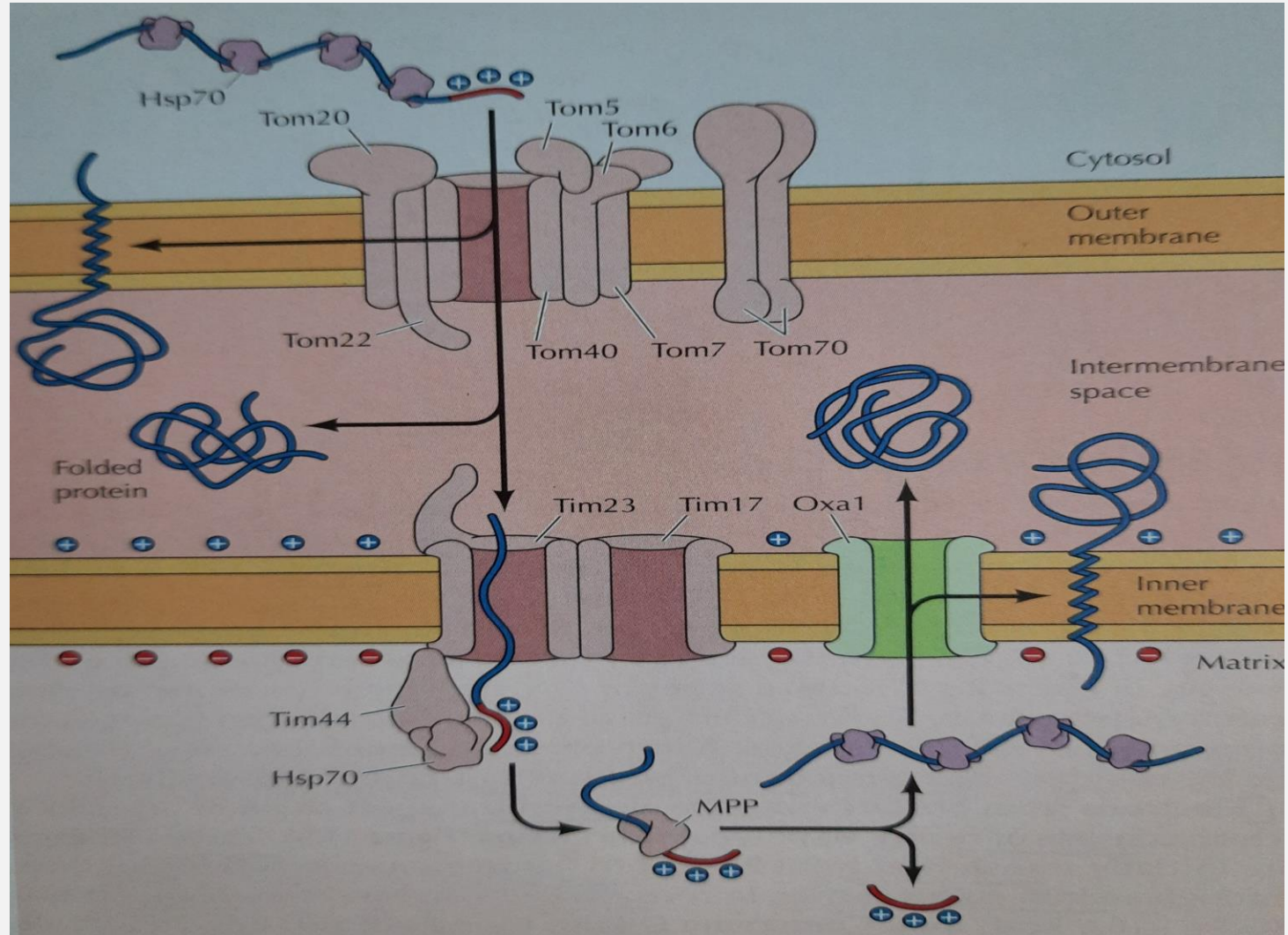
# FUNCTIONS OF CHAPERONES & CHAPERONINS



# IMPORT INTO MITOCHONDRIAL INNER MEMBRANE



# SORTING TO DIFFERENT MITOCHONDRIAL COMPARTMENTS





# ETC & ATP SYNTHESIS

- ETC complexes; I, II, III, IV
- Electron & Proton transfer
- Proton motive force
- ATP Synthase (complex V)

$$PMF = \Psi - \left( \frac{2.3(RT)}{F} \times \Delta pH \right)$$

where

- $\Psi$  = membrane potential = -160 mV across inner membrane (negative inside matrix)
- $R$  = gas constant = 1.987 cal/degree · mol
- $T$  = temperature (°K)
- $F$  = Faraday constant = 23.062 cal/mV · mol

