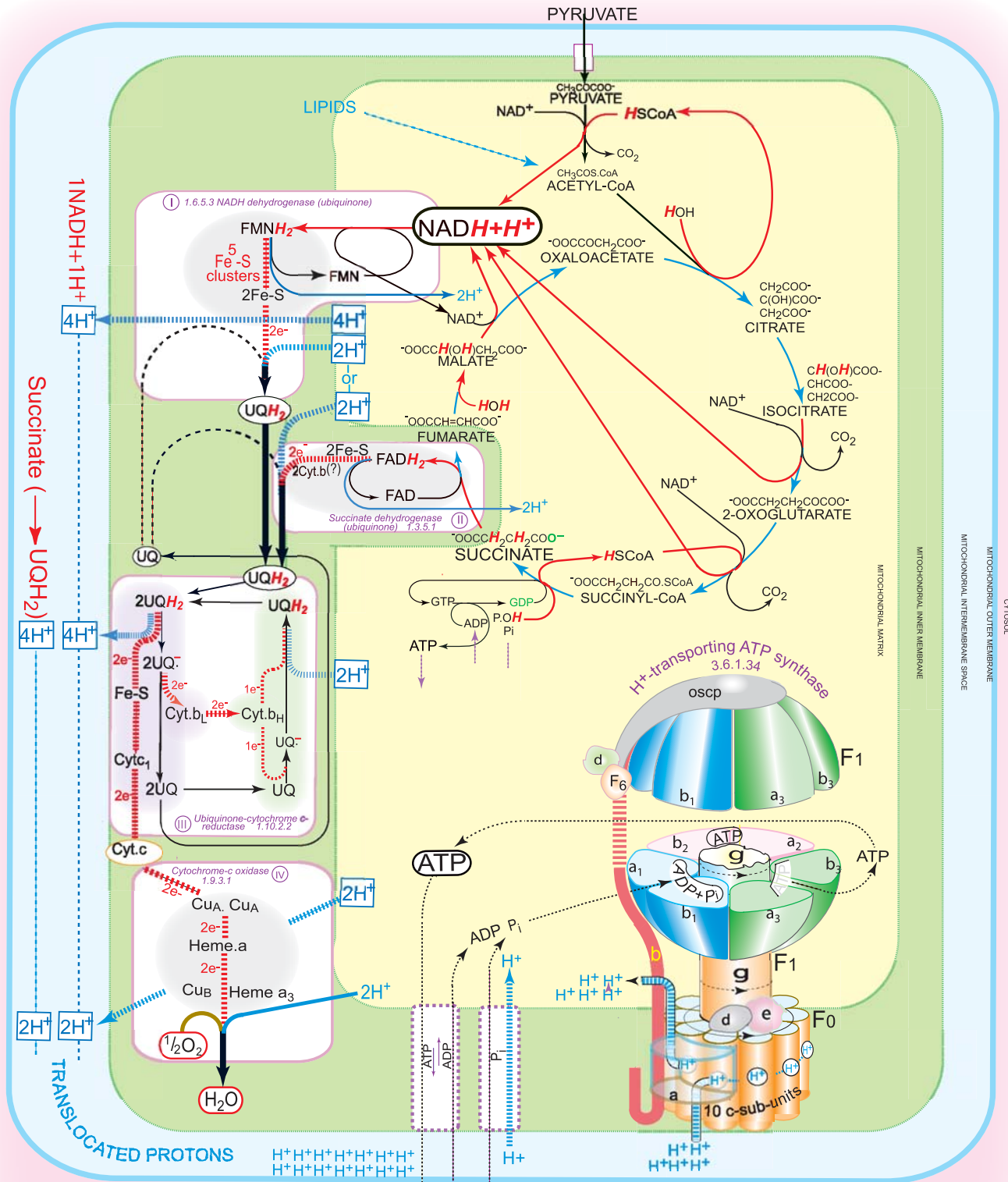


MITOCHONDRIAL ATP FORMATION



- (2) Electron flow (electric current)
- Source of hydride ions in NADH
- (2) Proton flow
- (2) Proton Translocation from Matrix to Intermembrane space or vice versa

The **g**rotor rotates in three 120° stages within the three (static) **a₁b₁**, **a₂b₂**, and **a₃b₃** subunit pairs in the F₁ complex
 In each revolution each of these pairs is sequentially activated
Stage 1: (Loose) **a₁b₁** binds ADP and Pi **loosely**
Stage 2: (Tight) **a₂b₂** binds ADP and Pi **tightly** to form ATP
Stage 3: (Open) **a₃b₃** **releases** ATP

Thus 3 ATP is formed from 3ADP+3Pi in each revolution of **g**
 One revolution of **g** is driven by 10 retro-located protons circulating through 10 c-subunits (- but this may vary)

The design and function of some of the sub-units shown is not yet clear and others (not shown) are a major focus of research