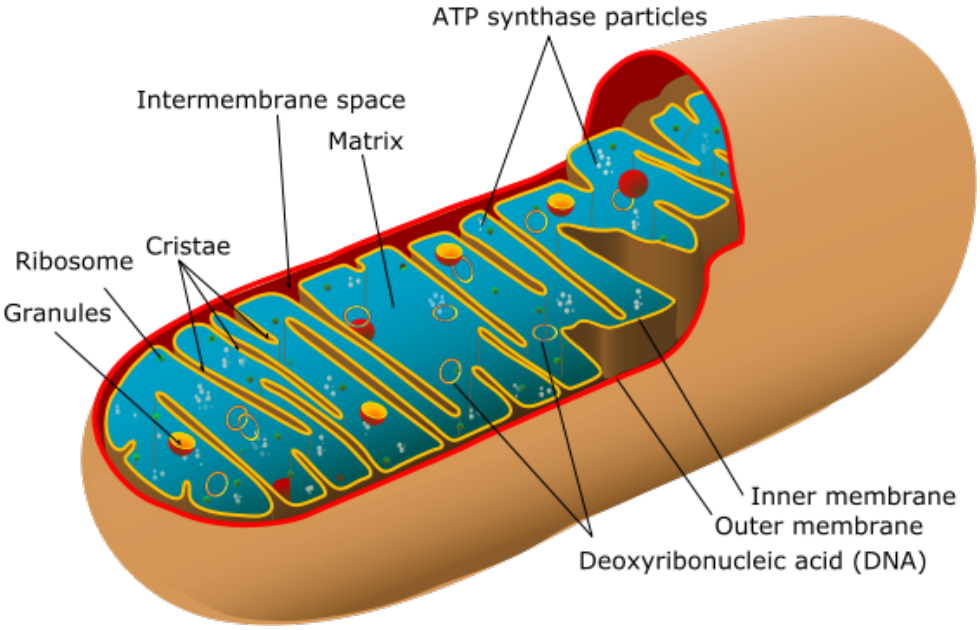
CONCEPT: MITOCHONDRIA

- The mitochondria has a distinctive structure
  - □ It is surrounded by _____ membranes
    - **Outer membrane**: Contains porin proteins which allow larger molecules to flow into
    - **Intermembrane space**: Space between the two membranes. Chemically equivalent to cytosol
    - **Inner membrane**: Impermeable to ions and small molecules – contains transmembrane proteins
      - Site of oxidative phosphorylation
      - Folded into **cristae**, which are infolds that increase the surface area of the membrane
  - □ The **matrix** is the internal space of the mitochondria

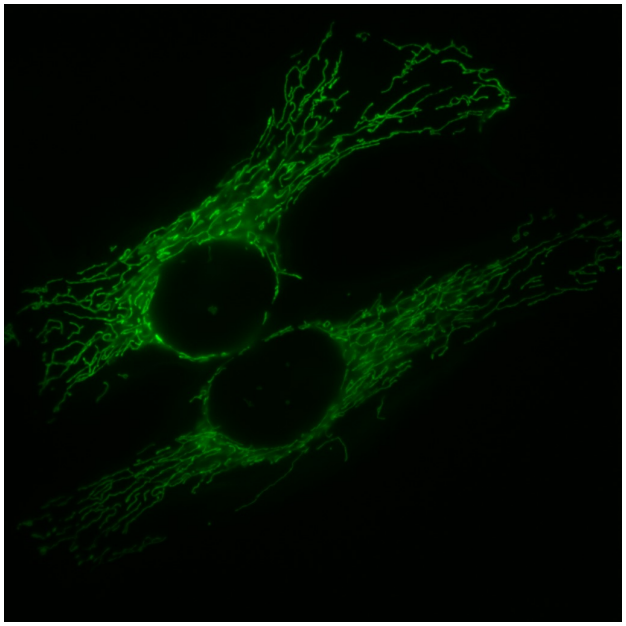
EXAMPLE: Mitochondria structure



- The mitochondria have _____ characteristics
  - □ Mitochondria can remain in fixed locations, or can move throughout the cell by traveling on microtubules
  - □ Mitochondria can fuse together to create long tubular networks
  - □ Mitochondria have their own, circular DNA genome
    - Encodes for 13 polypeptides, 22 tRNAs, and 2rRNAs
    - Create their own ribosomes that exist within the mitochondrial matrix

□ Mitochondria must important cellular proteins into the matrix

EXAMPLE: Fused mitochondria form tubular networks



PRACTICE

1. Match the mitochondrial structure with the correct definition

I.	Outer membrane	_____
II.	Intermembrane space	_____
III.	Inner membrane	_____
IV.	Cristae	_____
V.	Matrix	_____

a. Space between the two membranes
b. Internal space of the mitochondria
c. Contains porin proteins which allow larger molecules to flow into
d. Impermeable to ions and small molecules
e. Infolds that increase the surface area of the membrane

2. Which mitochondrial structure is the location of oxidative phosphorylation?
    a. Outermembrane
    b. Intermembrane space
    c. Inner membrane
    d. Matrix

3. True or False: Mitochondria always exist as distinct organelles that never come together to form larger structures.
    a. True
    b. False