

Extra Test Review Questions:

- Harry was very thirsty: he accidentally drank a poison named DCCD, to quench his thirst. Now he is feeling exhausted and he decides to lie down. Since you've studied cellular respiration in class, Harry is hoping that you can help determine what and where the problem is.

The facts:

- O_2 is present
- Harry is only producing 4 ATP molecules per glucose molecule
- Pyruvate is present in the cytosol and acetyl-CoA is present in the mitochondria
- NADH is at normal levels

- Give the facts above about Harry, where in the cellular respiration pathway does DCCD block?

- **Blockage in ETC (after NADH dehydrogenase)**

- How do you know? Justify your answer

- Only 4 ATP made (2 from glycolysis & 2 from Krebs cycle)
- NADH normal levels \rightarrow NADH dehydrogenase working properly
- Could be quinone, cytochrome b-c₁ complex, cytochrome c, cytochrome oxidase complex, ATP synthase
- More information needed to prove which one (ie NADH₂ levels, O_2 levels, H^+ concentrations...)

- Aruna is training to run a half marathon. She finds that if she runs at a slow, steady pace, she doesn't fatigue as easily and her muscles are not as sore afterwards. Today, Aruna has been jogging for about 45 minutes and is still full of energy. But Aruna can see that a thunderstorm is on its way and she begins to run at top speed to avoid getting wet. She starts to breathe heavier and heavier, eventually she gets so short of breath she has to stop. Explain why Aruna has to stop running. Use chemical changes and energy conversions to support your answer.

- Slow – enough oxygen supply to continue aerobic respiration
- Fast – not enough oxygen present to supply energy demands, begins lactic acid fermentation
- Body pants to increase intake of O_2
- Must stop due to buildup of lactic acid which causes pain & rigor in muscles

(a) Lactic acid fermentation occurs in humans.

