**Case Study: Are Great Kenyan Runners Born or Made?**

Alison found her seat on the flight from New York to Nairobi. An older woman sat down next to her and smiled. “I’m a nervous flyer” the older woman confessed. “Do you mind if I talk to you while the plane is taking off so I have a distraction?”

“Not at all,” said Alison. “What should we talk about?”

“Well, we could talk about the trip! Are you on vacation?”

“No,” Alison replied, “I’m going to work at a training camp for runners in Kaptagat. I’m an exercise physiologist.”

“Oh, how interesting! We Kenyans are great runners. I was never a very good athlete myself, but then, I’m not a Kalenjin. You know, in Kenya, we call them ‘the running tribe.’ They have the best genes for running!”

“I’ve heard that,” Alison said, “but I’m not totally sure it’s true.”

“Oh really, why is that?”

“There have been quite a few studies done to understand why Kenyan athletes have been so dominant when it comes to distance running, but nobody has really shown that Kenyans or Kalenjin athletes have a clear genetic advantage. There was one study that looked at the amount of mitochondrial oxidative enzymes in the muscles of Kenyan and Scandinavian runners and non-runners, which is something that has been shown to increase the body’s ability to use fat during exercise, and which is higher in distance runners, but they didn’t see any difference between Kenyans and Scandinavians, either among the runners or the untrained group. A lot of other studies have also failed to find innate differences between Kenyans or Kalenjin and athletes of other ethnicities.”

“That’s interesting. So why do you think Kenyans are such good runners if it isn’t in our genes?”

“I don’t know! It might be in the genes, and maybe we just haven’t found it yet, but I think more likely it’s something in the culture or the environment.”

“Maybe it’s because most Kenyans live in the mountains. And a lot of the great Kenyan runners are from rural areas and grow up having to run or walk long distances to school. And you know, lots of Kenyan kids grow up wanting to be the next Lornah Kiplagat or the next Kip Keino, but the American kids want to be LeBron James!” Use the information from this sheet and any other reliable resources available to you to answer the following questions.

 **Questions**

1. Why is mitochondrial oxidative enzyme content considered to be a measure of lipid utilization, and why might it specifically be helpful for an endurance athlete to have high levels of these enzymes?

2. Based on what you have learned about muscle fatigue in this module, propose a mechanism by which some people (Kenyan or otherwise) might be genetically predisposed to be better distance runners than others.

3. Based on what you learned about muscle fiber type in this module, propose a mechanism by which some people might be genetically predisposed to be better distance runners than others.