Animation Script

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Mitochondrial Biology with Dr. Bumsoo Ahn

To make the most out of this script, you could:

- Stick it in your notebook as a record of watching Bumsoo's animation
- Pause the animation and make notes as you go
- Add your own illustrations to the sheet
- Create your own animation to accompany it
- Add notes from classroom discussions
- Make notes of areas you will investigate further
- Make notes of keywords and definitions
- Add questions you would like answered – you can message Bumsoo through the comments box at the bottom of his article: **www.futurumcareers.com/mitochondrial-biology-with-dr-bumsoo-ahn**

SCRIPT:

Bumsoo grew up in South Korea, where he spent much of his time playing sports. This made him think about questions like, "Why does my heart beat faster during exercise?" and "How does training improve my performance?" He was fascinated by how exercise made his body feel stronger and more alive, which sparked his dream of studying human physiology.

During mandatory army service in South Korea, Bumsoo had to do parachute jumping. He found this terrifying, but sometimes, the only way to really know what you enjoy is through experience.

After completing his graduate degree, Bumsoo left academia and spent three years working in industry. These years were crucial for Bumsoo's professional development, but ultimately, he realized that he missed life as a research scientist, where he had the freedom to ask his own questions and take responsibility for the integrity of his work.

When he returned to academia, Bumsoo worked in a research lab where he studied mitochondrial defects in genetically-modified mice. While conducting this research, Bumsoo experienced the excitement of making unexpected scientific discoveries that raised new questions. He also gained the confidence and curiosity that continue to drive his research. Today, Bumsoo is a mitochondrial biologist at Wake Forest University School of Medicine, and his curiosity has turned into a deep desire to uncover how mitochondria support muscle health, and what happens when they fail.

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Mitochondria provide our cells with energy via the process of respiration, converting sugars and fats into energy-carrying molecules called ATP. Unfortunately, this vital process also produces reactive oxygen species, which can damage DNA and proteins, accelerating the aging process.

This can be particularly problematic in muscles, which require lots of energy to contract and relax. This energy demand is met by an abundance of mitochondria within muscle cells which can lead to a build-up of reactive oxygen species, damaging the muscles and leading to the loss of muscle mass and function known as sarcopenia.

Currently, the only effective method for reducing sarcopenia is exercise; however, even the positive effects of exercise decrease as we get older. Bumsoo is hoping to find new ways to delay sarcopenia so that people can maintain a high-quality lifestyle for longer.

Bumsoo has conducted promising experiments with a hormone called ghrelin. Although ghrelin is usually associated with controlling our appetite, the unacylated form has a different structure and functions. Bumsoo's experiments show that unacylated ghrelin may also counteract age-related muscle loss and weakness by enhancing mitochondrial function and promoting muscle growth, without increasing appetite.

While unacylated ghrelin may prove to be an excellent tool for slowing sarcopenia, it will likely need to work in tandem with other therapies, such as exercise regimens, to maximize its benefits. Bumsoo's overarching goal is to preserve mobility and independence in older adults for as long as possible.

Now that you've heard Bumsoo's story, what could you achieve as a mitochondrial biologist?

Let us know what you think of this educational and career resource. To provide input, simply scan the QR code or use this link: redcap.school.wakehealth.edu/surveys/?s=NPK347RYHCR3FNDC