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ANIMATION SCRIPT

BIOMEDICAL SCIENCE WITH DR CATHERINE BRISSETTE - UNDERSTANDING THE MECHANISMS BEHIND LYME DISEASE

TO MAKE THE MOST OUT OF THIS SCRIPT, YOU COULD:

- Stick it in your book as a record of watching Catherine'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 key words and definitions
- Add questions you would like answered – you can message Catherine through the comment box at the bottom of her article: **futurumcareers.com/understanding-the-mechanisms-behind-lyme-disease**

SCRIPT:

Lyme disease is a bacterial infection that can affect humans if they are bitten by infected ticks. Ticks become infected when they bite an animal that has Lyme disease. Ticks are not affected by the disease, but it can cause serious problems in humans.

Symptoms of Lyme disease include a circular red rash, high temperature, headaches, muscle pain and fatigue. The infection is treated with antibiotics and most patients get better relatively quickly, but some people experience severe symptoms that can last for months. For example, Lyme disease can cause neurological complications such as facial paralysis, decreased concentration, memory and sleep disorders and nerve damage in the arms and legs.

There are approximately 500,000 cases of Lyme disease every year in the US. It is also prevalent across Europe and parts of Asia.

Scientists know how the disease is spread and how to treat it. But there is still much we do not know about Borrelia, the bacterium that causes Lyme disease.

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To develop understanding in this area, Dr Catherine Brissette, a biomedical scientist, is investigating how the bacterium that causes Lyme disease persists and leads to long term infections. Catherine's team is hoping to answer important questions, such as why Borrelia grows in certain tissues, how Borrelia causes disease, and how Borrelia survives in ticks and in the host.

Interestingly, Borrelia itself does not make toxins. Catherine and her team believe the severity of Lyme disease depends on how individuals respond to the bacterium – which differs from person to person. It is likely that symptoms depend on several factors, such as genetic differences and environmental factors.

Catherine's studies revolve around three distinct (though related) focus groups:
1) interactions between the bacterium and the host – which might be humans or animals;
2) neuroscience; and
3) epigenetics.
Epigenetics is the study of how behaviours and environment cause changes that affect the way our genes work.

To be able to answer questions in these three areas, animal models are critical to Catherine's research. In fact, Catherine's work has shown the biomedical community that mice are a viable model system to study the neurological effects of Lyme disease.

Some of the team's results are focused on how the disease affects the nervous system; it has discovered that Borrelia colonise the lining of the brain, which results in a particular immune response within the brain itself.

Catherine believes we are very close to an effective therapy for all patients. As a biomedical scientist, she is passionate about helping people recover from Lyme disease. What could you achieve in the field of biomedical science?