

Alannah Grant 3MT Transcript | University of Guelph Campus Final 2020

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Title: City Living: the influence of urban stress on early rates of neurogenesis in eastern grey squirrels

Transcript: So right now I'd like you to think back to the last time you were in a large city. Picture the sites, sounds and smells you experienced while you were there. Now I'm sure we're all thinking of similar things; lots of people, heavy traffic and an flurry of lights and activity. To us, these things are just a harmless, if not annoying, part of city life. But for the wildlife we share our cities with, these things can actually be a source of a great deal of stress. Stress that in turn, may have impact on their survival. Currently, the Urban landscape is the fastest growing habitat type on the planet. Meaning more and more, animals are becoming exposed to human modified landscapes and the stress of a city life.

One city slicker you've probably noticed, is the Eastern grey squirrel. This species has been widely successful in colonizing the urban habitat, which leads us to ask: what impact is this new habitat having on them? Well, grey squirrels are characteristically known for their ability to hide food and find it later, known as "caching". Caching is fundamental to squirrel survival as it allows them to make it through periods of low food availability and our long Canadian winters.

The ability to find caches, sometimes months after hiding them, is possible through a process called neurogenesis. The phenomenon of neurogenesis is the creation and growth of brand new brain cells and typically takes place in the hippocampus region of the brain. A region closely associated with memory formation.

Some animals that exhibit neurogenesis, are able to produce up to 700 new brain cells a day! Mind blowing right? Or should I say mind growing? But, like any other function in the body, neurogenesis can change based off of lifestyle. Studies have shown that during periods of increased stress, neurogenesis slows down, and memory formation can stop all together. For example, humans with PTSD, a disorder closely linked to elevated stress levels, have been found to have reduced memory accuracy.

So what my research focuses on is examining the impact of urban areas on the stress, and rates of neurogenesis in grey squirrels. Where I expect that if urban environments are a source of stress, then we'll see reduced rates of neurogenesis in urban grey squirrels when compared to squirrels from natural habitat types. Using the University of Guelph campus and the rare research reserve in Cambridge as my study sites, I plan to monitor stress levels in the blood via

hormone markers and rates of neurogenesis, using tissue staining methods that allow me to see and count the number of newly developed brain cells in samples from squirrels in both habitat types.

But why is this important? Well, it may seem like a small drop in a very large bucket but by understanding the specific effects of urbanization on wildlife we are then able to create more accurate and meaningful conservation strategies to mitigate the consequences. And overall, from my study and others like it we are able to build on our own knowledge of our impact on the world around us, which truly is mind growing.

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