



## USING A PASSING GAME TO TEACH NERVE CONDUCTION

ANN GATHERS

As a neuroscientist, I am easily excited by the concept of the saltatory conduction of action potentials down a myelinated neuron. However, the complexity of the nervous system's anatomy and physiology can dampen the interest of some students. To pass my excitement along to my students and to clarify the effects of myelin on neuronal activity, I use a tangible analogy to teach action potential conduction down unmyelinated versus myelinated axons.

After explaining the general structure of neurons, the function of each neuronal component, and the composition and function of myelin, I choose 13 students to line up against a wall in the classroom. I select four males and nine females or four females and nine males to form a line at the front of the room. Each student lines up shoulder-to-shoulder alternating three male or female students with one male or female student (i.e. one male, three females, one male, three females, . . .). I explain that the line is representative of an unmyelinated neuron.

Using an object that can be passed quickly from hand to

hand (e.g., set of keys, small ball, etc.), I begin the illustration by giving the object (representative of the action potential) to the first student in the line. I coach the students to pass the object, from person to person, to the end of the line as quickly as possible while I time the transaction.

Next, I ask the alternating groups of three to take their seats leaving only four, widely-spaced individuals standing in line. The second line-up represents a myelinated neuron. I begin the illustration again by encouraging the remaining four students to toss the object down the line from person to person as quickly as possible. Again, I time the process and note how rapid the second method is compared to the first.

I explain that the gaps in the second line-up are representative of myelin patches called internodes and the participants are representative of the Nodes of Ranvier. The quick passing of the object from person to person across the gaps is similar to the "jumping" of action potentials down a myelinated axon.

Kinesthetic and visual learners find this activity beneficial. All students find the analogy entertaining and a nice break from the normal pace of the lecture. Using this activity and others, I have found that analogies and active participation stimulate concept learning and excitement about scientific topics.

*ANN GATHERS is Assistant Professor of Biological Sciences, The University of Tennessee at Martin, Martin, TN 38238; e-mail: [agathers@utm.edu](mailto:agathers@utm.edu).*

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