

INTEGRATING BIOLOGY**● Electric Eels**

Electric eels are found in the Amazon, Orinoco, and other muddy rivers in the tropical regions of South America. They grow as large as 2.75 m (9 ft) long and weigh up to 22 kg (49 lb). Electric eels are one of the few animals that can make, store, and discharge electricity. Electric eels use the electricity they generate to navigate, communicate, stun or kill their prey, and defend themselves.

Electroplaques

You can understand how an eel generates electricity by imagining its body as a series of batteries. An eel's body is made mostly of an organ that produces electricity. This organ is made up of 5,000 to 6,000 special muscle cells called electroplaques. The electroplaques are lined up like cells in a dry battery. Each electroplaque produces only a small voltage. However, eels can activate all of their electroplaques at the same time and produce a much higher voltage. When electric eels discharge electricity, the current flows either from head to tail or in the opposite direction. The more electroplaques that are activated, the greater the discharge.

Electric eels have more than one level of discharge. They generally discharge about 25 to 75 V, but when they discharge from all the electroplaque cells at the same time, they can jolt the receiver with as much as 500 to 650 V of electricity. Electric eels can also emit low discharges of 5 to 10 V.

Your Turn to Think

1. Would the size of an electric eel influence the amount of volts that it could discharge? Why or why not?
2. How does the highest discharge of an electric eel compare with the voltage that comes out of a normal wall socket?
3. Would it be dangerous for a human to be in the water near an electric eel that discharged a jolt of electricity to stun a large fish? Why or why not?