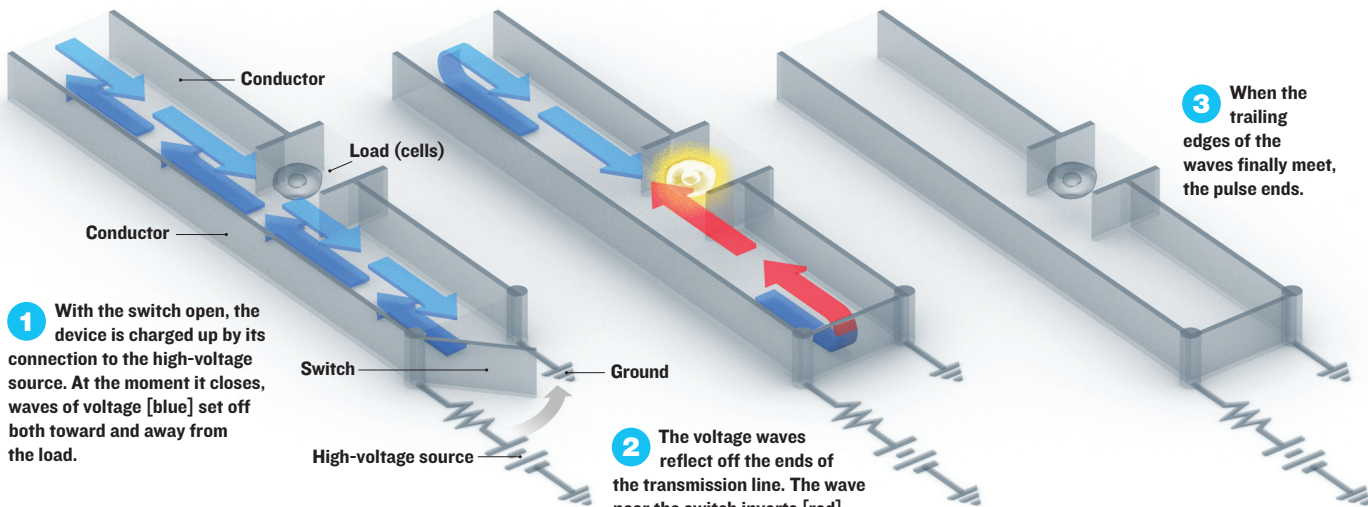
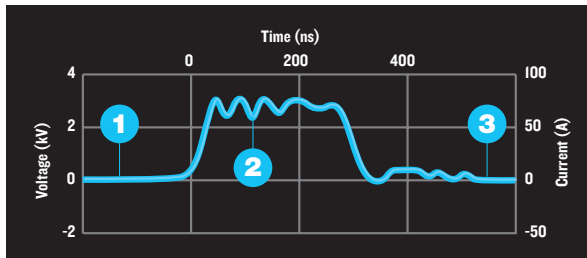


POWER PULSE: Bioelectrics experiments often use what are called Blumlein transmission line pulse generators, because they can deliver a nanoseconds-long pulse with the full voltage of a high-voltage source. The generator is made of transmission lines, that is, paired conductors [dark gray] sandwiching a dielectric [light gray]. The load, the cells to be shocked, sits in a break in one of the conductors, which is connected to ground. The device's other conductor is connected to a high-voltage source.



1 With the switch open, the device is charged up by its connection to the high-voltage source. At the moment it closes, waves of voltage [blue] set off both toward and away from the load.

2 The voltage waves reflect off the ends of the transmission line. The wave near the switch inverts [red]—its polarity changes—when it reflects, because that end is shorted. When the inverted and noninverted waves crash into each other at the load, a pulse of voltage results.

3 When the trailing edges of the waves finally meet, the pulse ends.