

RETHINKING CRAMPS

New research reveals that cramps may have nothing to do with electrolytes or hydration level.

By Mackenzie Lobby Havey



IT STARTS AS a twinge in your calf or maybe your hamstring, usually on the run. Then suddenly, the muscle takes on a life of its own, seizing and twitching wildly. The pain leaves you clutching your leg and limping back home. Your workout, inexplicably, is over. ¶ Over the years there have been numerous hypotheses around what actually causes muscle cramping in athletes—theories such as hydration state, low potassium levels and fatigue. ¶ The latest studies, however, suggest that it may all come down to the communication between our nerves and muscles. Promising research conducted by neurobiology professor Bruce Bean and neuroscientist and Nobel Prize winner Rod MacKinnon suggests that during exercise, the motor neurons become overly excited, causing the muscles to contract. ¶ “A lot of exercise physiology research over the last five years has shown convincingly that muscle cramps come from the over-activity of the nerve and that it has nothing to do with dehydration, electrolyte loss or lactic acid build-up,” Bean explains. “What triggers the nerve to become hyper-excitable we still don’t exactly know, but the hypothesis is that it involves a positive feedback loop—that muscle activity increases the activity of the nerve and then the nerves controlling the muscles become very active, which then causes muscle cramping.”

WHAT'S IN HOTSHOT?

Each shot is made with non-GMO, organic ingredients, and the flavor comes from a proprietary combination of spice extracts that the creators determined were effective in treating and preventing muscle cramps. Non-active ingredients include cane sugar, lime juice concentrate and sea salt. The creators recommend taking it 15–30 minutes before workouts to prevent cramps, or during a workout as soon as you start feeling cramps taking hold.



Building on past research, Bean and MacKinnon discovered that certain tastes could activate ion receptors in the mouth and esophagus, helping to calm those excitable nerves, thereby preventing the muscles from cramping. While athletic trainers have experimented with things like pickle juice and mustard, Bean and MacKinnon have spent the last few years coming up with their own concoction that they hope is both palatable and effective. Dubbed “HOTSHOT,” their 1.7-ounce sharp-tasting drink promises to interrupt the process by which the muscle cramps occur to improve neuromuscular performance.

“We are tapping into very powerful modulatory circuits in the nervous system—all of which can help control the excitability of motor neurons in the spinal cord,” Bean says.

While the Bean-MacKinnon team has had plenty of success in their own trials with the drink, the real test run will be out on the roads and trails this season as athletes of all shapes, sizes and experience levels begin trying out this new solution for an age-old problem.