

Hot peppers really do bring the heat

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Chili peppers can do more than just make you feel hot, reports a study in the August 1 *Journal of Biological Chemistry*; the active chemical in peppers can directly induce thermogenesis, the process by which cells convert energy into heat.

Capsaicin is the chemical in chili peppers that contributes to their spiciness; CPS stimulates a receptor found in sensory neurons, creating the heat sensation and subsequent reactions like redness and sweating.

Now, Yasser Mahmoud has found that capsaicin can create "heat" in a more direct manner by altering the activity of a muscle protein called SERCA. Normally, muscle contraction initiates following the release of a wave of calcium ions from a compartment called the sarcoplasmic reticulum (SR); SERCA then actively pumps the calcium back into the SR (using ATP energy), causing muscle relaxation and renewing the cycle.

Capsaicin, however, can attach to SERCA and "uncouple" this pumping activity; that is, the protein still burns ATP energy but doesn't use it to pump calcium. Instead, all the ATP energy is given off as heat. This uncoupling, known as thermogenesis, is one important method of staying warm and is most often seen in hibernating animals.

Mahmoud notes that capsaicin is the first natural compound known to augment the thermogenesis process .

These findings further explain how capsaicin intake can increase

metabolism and body temperature. And although these studies required relatively high amounts of capsaicin (probably more than someone could eat), the structure of capsaicin could be used as a model to design more potent compounds that might have clinical use such as treating hypothermia.

Source: American Society for Biochemistry and Molecular Biology

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