Pain Management, Habanero Style

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TAU scientist works on "spicy" ways to manage chronic and intense pain

While most of our daily aches can be treated with common over-the-counter medications, there is no effective relief for millions of Americans debilitated by chronic inflammatory, neurogenic, or cancer pain. For them, pain treatments work only ten percent of the time, and those treatments have pronounced side effects.

Tel Aviv University's ***Dr. Alexander Binshtok***, however, is working on an alternative — based on the common chili.

Chili is credited with a variety of healing properties, such as easing the digestive system and clearing congestion. But by joining capsaicin, the substance that makes chili hot, with QX-314, a chemical derivative of the common local anaesthetic lidocaine, Dr. Binshtok and his colleagues are able to target selective pain fibers and effectively block the pain.

"We have demonstrated that this method blocks painful stimuli without any side effects," says Dr. Binshtok, who was recruited by TAU's ***Sackler School of Medicine*** from the Harvard School of Medicine to advance his groundbreaking work on pain management.

So Far and No Further

Dr. Alexander Binshtok

"The holy grail of any local anaesthetic treatment is to stop pain without causing any other effects," says the researcher. That's why this approach has the potential to change multiple applications of local anaesthesia, from the dental office to the delivery room.

Epidurals are one example of a pain management technique that will be revolutionized by this red-hot medication. Epidural anaesthesia compromises body function to the point where a woman cannot walk and her ability to "push" during labor is limited. With the new pain drug, she will be able to do both painlessly, says Dr. Binshtok, eliminating the need for an epidural.

But Dr. Binshtok, who will be directing his own pain management lab at Tel Aviv University beginning this fall, warns that before a "miracle drug" is produced, there is still more testing and research to be done — but he is confident that it will come about.

The Mysteries Behind Pain

"Many people suffer from chronic pain but we don't understand why. We don't understand the nature of it," says Dr. Binshtok. He is determined to solve this ultimate mystery of pain — the mechanism that causes it in the first place.

"Nobody knows what turns normal or protective pain to chronic or non-protective pain, and we don't yet understand the agents or molecules that turn normal into chronic pain," says Dr. Binshtok. Some lucky people carry a specific genetic variance that makes them more resistant not only to pain but to the development of chronic pain after surgery. Understanding this mechanism could be the key to solving pain problems.

Dr. Binshtok explains that the fibers in the body act as "telephone lines" along which pain travels from the skin to cell bodies and ultimately to the spinal cord. His work will study what happens on the periphery when painful stimuli attack the skin, and attempt to understand "how the process is analysed by pain fibers, and then how it is processed by the neurons in the spinal cord" which modify pain signals.

In collaboration with various departments at Tel Aviv University, Dr. Binshtok hopes he will be able to mimic chronic pain. In the meantime, he presses on to find a hot and spicy remedy for one of life's greatest mysteries.

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Effective pain relief? An Israeli researcher has discovered that the property that makes chili peppers hot, could be used to stop pain.

Health

Israeli scientists spice up chronic pain management

By ISRAEL21c staff

May 12, 2009

Ask people what they fear most about any medical procedure and they'll tell you it's not the operation itself but the pain that goes with it. Anaesthesia also has its drawbacks with side effects like loss of consciousness, wooziness and numbness.

"The holy grail of any local anaesthetic treatment is to stop pain without causing any other effects," says Dr. Alexander Binshtok of Tel Aviv University's Sackler School of Medicine. That noble goal may now be within reach with a new approach based on the common chili pepper.

Chili is credited with a variety of healing properties, such as easing the digestive system and clearing congestion. But by joining capsaicin, the substance that makes chili hot, with QX-314, a chemical derivative of the common local anaesthetic lidocaine, Binshtok and his colleagues are able to target selective pain fibers and effectively block the pain.

"We have demonstrated that this method blocks painful stimuli without any side effects," says Binshtok.

An end to epidurals

The new approach has the potential to change multiple applications of local anaesthesia, from the dental office to the delivery room. Epidurals are one example of a pain management technique that will be revolutionized by this red-hot medication.

Epidural anaesthesia compromises body function to the point where a woman cannot walk and her ability to "push" during labor is limited. With the new pain drug, she will be able to do both painlessly, says Binshtok, thus eliminating the need for an epidural.

Then there is the problem of the pain suffered by millions of Americans with chronic inflammatory diseases, neurogenic diseases, or cancer. "Many people suffer from chronic pain but we don't understand why," says Binshtok. "Nobody knows what turns normal or protective pain to chronic or non-protective pain, and we don't yet understand the agents or molecules that turn normal into chronic pain."

Binshtok explains that some lucky people carry a specific genetic variance that makes them more resistant not only to pain but to the development of chronic pain after surgery. Understanding this mechanism could be the key to solving pain problems.

Researching pain

As a post-graduate student, Binshtok was part of the research team from Massachusetts General Hospital (MGH) and Harvard Medical School (HMS) that succeeded in selectively blocking pain-sensing neurons in rats without interfering with other types of neurons, giving hope that someday there will be an anaesthetic that blocks pain but doesn't paralyze or numb the patient.

This fall, Binshtok will be directing his own pain management lab at Tel Aviv University. His work will study what happens on the periphery when painful stimuli attack the skin, and will attempt to understand "how the process is analysed by pain fibers, and then how it is processed by the neurons in the spinal cord" which modify pain signals.

And while he warns there is still more testing and research to be done before a "magic bullet" miracle drug is produced, he is confident that it will come.

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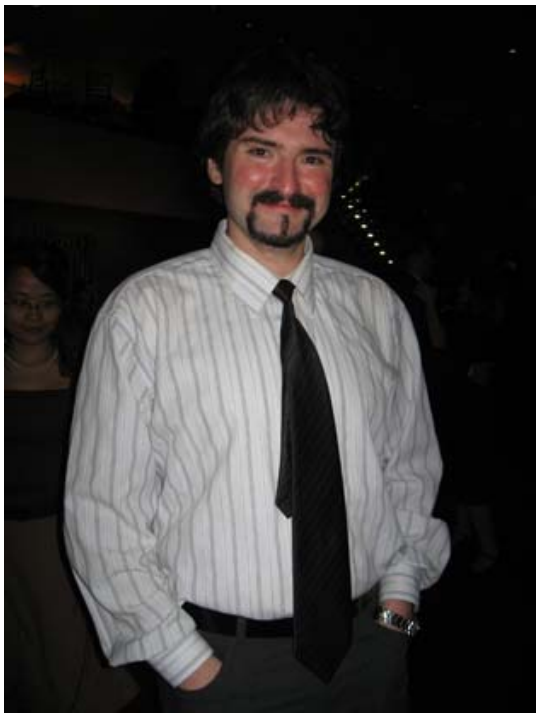

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Background

Alex received his B.S. in Physical Therapy from the Ben Gurion University in Israel. He joined the NPRG at 2006 after receiving a Ph.D. in Neuroscience from the Hebrew University of Jerusalem, Israel where he studied membranal and synaptical properties of cortical neurons. His current research interests focus on 1) Direct effect of cytokines on excitability of primary sensory neurons to contribute to peripheral and central sensitization and to inflammatory pain; 2) Mechanisms of tetrahydrobiopterin (BH4) producing pain and in particular the effect of BH4 on excitability of primary sensory neurons; 3) Development of novel local anesthetics 4) Changes in synaptic properties of primary and secondary order sensory neurons following nerve injury 5)The effect of prostaglandin and bradykinin on nociceptors to contribute to inflammatory pain.

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