



NAVIGATION ☰

Connective Tissue and Inflammation with Helene Langevin

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Dr. Helene Langevin received her medical degree from McGill University and did a post doctoral research fellowship in Neurochemistry in Cambridge, England. Her residency in Internal Medicine and fellowship in Endocrinology and Metabolism was at Johns Hopkins Hospital. She is a Professor in Residence of Medicine at Harvard Medical School, Brigham and Women's Hospital and is also a part-time Professor of Neurology,

Orthopedics and Rehabilitation at the University of Vermont College of Medicine. She was appointed as Director of the Osher Center for Integrative Medicine at Harvard Medical School and Brigham and Women's Hospital in November 2012.

As if that weren't enough to keep a person busy... In our worlds she is best known as the Principal Investigator of NIH-funded studies investigating the role of connective tissue in low back pain and the mechanisms of manual and movement based therapies and

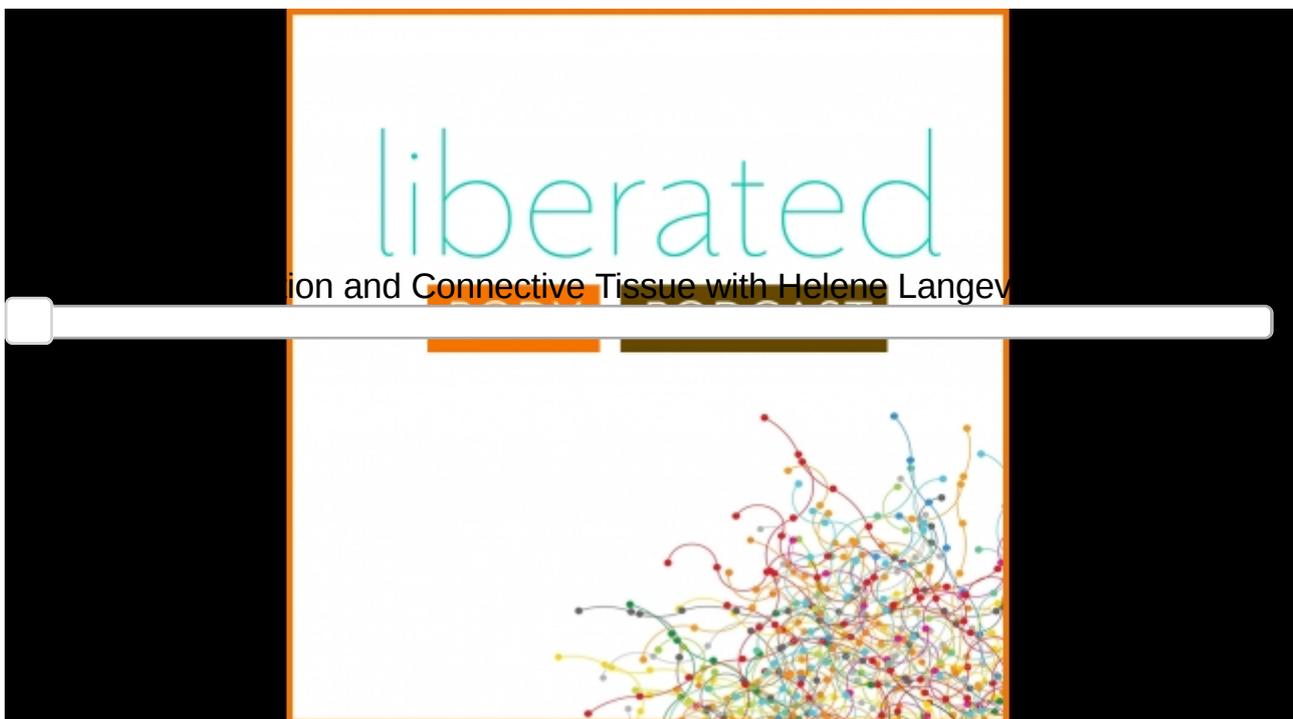
acupuncture.

Today she joins me to talk about her research- specifically how stretching impacts inflammation resolution in connective tissue, how connective tissue is a critical component of the immune system, how movement influences immune processes, and what this all might mean for both prevention and resolution of both chronic pain and cancer.

GET IT ON ITUNES

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Conversation highlights

- Why her research focuses on the role of connective tissue in chronic pain, and the mechanisms of movement and manual based therapies as well as acupuncture.
- Her first NIH grant in which they designed a robotic arm to manipulate acupuncture needles and found that the cause of the force was greatly increased when the needle was rotated. This was due to the mechanical stimulation delivered to the connective tissue.
- How this got her interested in the effects of stretching tissue.
- Research suggests acupuncture needles interact with different pathways in the nervous system. The connective tissue can simply be the mechanical link between needle and sensory nerves.

- They found that there are cells within connective tissue- the fibroblasts- which change shape. They expand and remodel internally. So the needle might be having an effect on the connective tissue in addition to what happens in the nervous system.
- When the fibroblasts change shape they secrete ATP. It's a molecule we think of in terms of energy in production in the cell. However, ATP can be used in a different way and can function as a signaling molecule outside the cell. Release of ATP from cell is necessary for the cell to change shape.
- There is research being done at The University of Rochester by Dr. Nedergaard and Dr. Takano (in resources) on the effect ATP downstream- showing an analgesic effect on sensory nerves.
- Dr. Langevin clarifies her 2002 paper *Relationship of acupuncture points and meridians to connective tissue planes* (in resources) saying, "We have to be careful here when we talk about correlation of acupuncture meridians and fascial planes." and "it's not surprising the channels are found between a bone and a muscle or between two fascicles of a muscle... does that mean that fascial planes are the same as meridians? I wouldn't say that"
- Cancer is not just a collection of tumor cells growing out of control> They need a base and that base is the connective tissue- the stroma. The cancer takes the connective tissue hostage.
- Dr. Patricia Keely at The University of Wisconsin has studied that cancer is likely to spread along places where the connective tissue matrix forms these railroads where the cancer can spread. (in resources)
- Dr. Langevin's paper *Stretching Impacts Inflammation Resolution in Connective Tissue* (resources). She defines inflammation and what it means for both cancer and chronic pain.
- In musculoskeletal pain it's not always clear where the tissues are that are creating the pain. In low back pain for years the belief was that it was coming from the spine.
- How does fascia generate pain? The soft tissues of the back can be the source of pain if they have a source of persistent inflammation in the tissues.
- Dr. Langevin defines stretching and the protocol they used with the rats at UVM in the research study.
- Viscoelastic changes in fascia can happen fairly quickly, but the fibroblasts are much slower and didn't start changing until about the 10 minute mark.
- I ask Dr. Langevin to differentiate between movement and stretching.
- Static vs. dynamic stretching is a very important differentiation.
- In the studies of athletes and static stretching, "I'm not convinced athletes weren't stretching too much? Stretching beyond the limits is ripping the tissue, and the idea more is better may not apply. Achieving the right and specific force of the tissue may be very important."
- The connective tissue is really the home of the immune system.
- In her current research she is pursuing the aspect of inflammation resolution with respect to the dose of stretching. She also wants to see the role of connective tissue in back pain and the response to body based treatments- both manual and movement based.
- She is also interested in looking at longitudinal studies- observing back pain over time. Children and adolescents that are getting back pain at an earlier and earlier age- do changes in connective tissue precede the development of back pain?

Resources

[Dr. Helene Langevin on Brigham and Women's website](#)

Osher Center for Integrative Medicine- a partnership between Harvard University and Brigham and Women's Hospital

Dr. Langevin's paper *Stretching Impacts Inflammation Resolution in Connective Tissue*

Dr. Nedergaard and Dr. Takano research at the University of Rochester

Dr. Langevin's paper *Relationship of acupuncture points and meridians to connective tissue*

Dr. Patricia Keely's research at the University of Wisconsin on how cancer spreads along "lines" in the connective tissue

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