

## The Enigmatic Puzzle of Pain

The research endeavors into the complex pain mechanisms of fibromyalgia are a daily struggle from passionate scientists on a constant quest to link new pieces in the enigmatic puzzle of pain. One of the pioneers is Professor Lars Arendt-Nielsen who provides an update on the current fibromyalgia research.

### The invisible pain

But you don't look sick at all...! This comment is often a daily part of the lives of many fibromyalgia patients because life with a chronic pain disease may be invisible to friends, family and colleagues. Thus, it can be difficult for all external surroundings to understand how a person can live every single day with such pain and torment that it feels like living with both hands on a boiling hot kettle or having one's body wrapped in the sharpest barbed wire. These touching and telling metaphors are used by fibromyalgia patients themselves to put into words how disabling the invisible pain of fibromyalgia can be. But how can one make the invisible pain visible?

This question is at the heart of pain research, explains Professor, dr. Lars Arendt-Nielsen from Aalborg University in Denmark. "Fibromyalgia patients were labeled as neurotic 30 years ago. It was this lack of recognition of fibromyalgia pain and the lack of understanding of the underlying mechanisms that started my interest in the entire field of scientific research in chronic pain conditions as I wanted to develop scientific techniques for measuring pain."

Such techniques have been developed whereby fibromyalgia patients are exposed to standardised pain stimuli at various points on the body while monitoring patients' pain response which may be, for example, a pain threshold to a pressure stimulus or a reaction from the brain. These scientific pain measurement techniques demonstrate unequivocally that people with fibromyalgia respond much more strongly to pain than the average person, Lars Arendt emphasizes.



*Lars Arendt-Nielsen is a Professor at Aalborg University where he has founded the human pain research group which today is ranked is among the world's largest and most productive. The research focuses specifically on the measurement of so-called neuroplastic mechanisms in the pain system.*

*These mechanisms are essential for patients with chronic pain in developing a hypersensitive pain system. The group's international status is primarily due to the objective pain measurement methods that have been developed and clinically tested to meet the highest scientific standards.*

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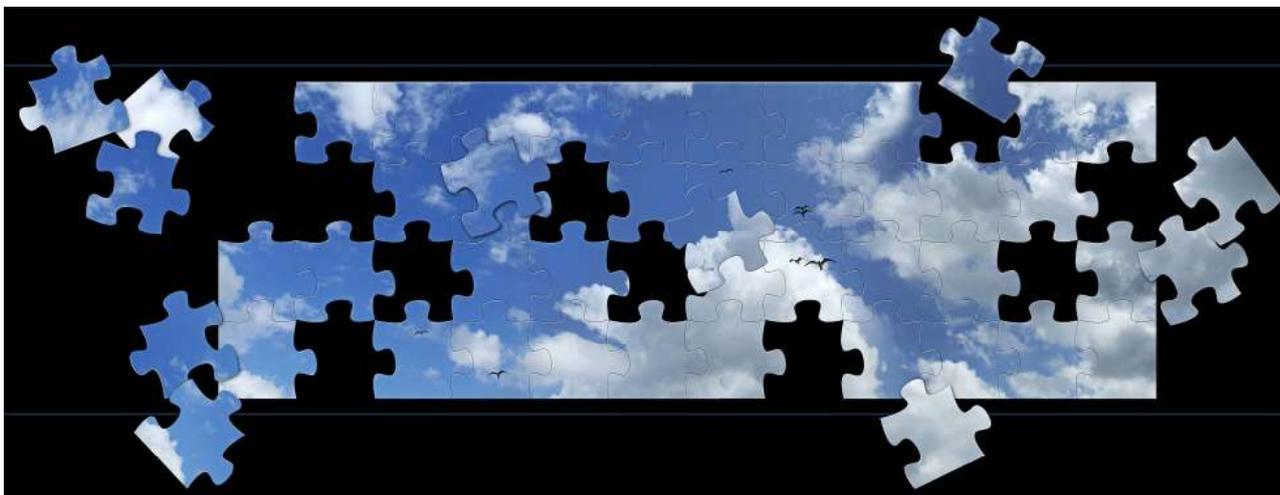
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### **Immune system off-balance**

One possible explanation for the hypersensitive pain system may be that the immune system of fibromyalgia patients is off-balance, Lars Arendt points out and refers to the current clinical trials on LDN ('Low-Dose-Naltrexone').

"Naltrexone may be able to modulate pain in fibromyalgia patients and this is probably because Naltrexone, among other things, may contribute to restoring the balance of the immune system or inhibiting the so-called glial cells' production of pain-causing substances. An improved balance of the immune system has been shown in various studies to have a positive effect with respect to reducing pain."

Research in fibromyalgia and other chronic pain diseases has also focused on genetics in order to find a specific genetic composition in fibromyalgia patients. However, limited knowledge has been achieved by specific genetic profiling, but genetic research has gained a new discipline called 'epigenetics'. Here, science seeks to uncover how environmental factors can affect the function of genes and this research field has already proven very successful in other fields such as cancer treatment. Specific epigenetic changes may be of importance for understanding chronic pain including patients with fibromyalgia.



*Day by day, new pieces are linked in understanding the enigmatic puzzle of pain. With this gradual understanding, the invisible pain becomes more and more visible and this gives hope for a better life for all fibromyalgia patients.*

### **New pieces of the puzzle**

As part of the research in epigenetics, Lars Arendt is currently investigating twins, one of whom has fibromyalgia. "Here we have two people who have quite identical genetic profiles but may have different epigenetic profiles as one twin has developed a chronic pain disease while the other has not. In some cases, opposing life cycles may have attributed to different external influences from the environment which can induce the 'epigenetic fingerprint'. With a specific fingerprint, there may be changes in the way the genes express different pain-producing substances, modulate specific pain mechanisms, or induce changes in specific pain receptors."

Thus, new elements are constantly being added to the understanding of the effects of chronic pain on the human body and Lars Arendt welcomes the fact that pain patients are playing an ever-increasing role in the global scientific agenda. A stronger interaction between the professional world and the patient world is thus a hallmark for Lars Arendt in his role as president of the International Association for the Study of Pain (IASP).

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“At the recent World Pain Congress in Boston in 2018, we had a designated area where pain patients could meet and discuss the scientific presentations directly with the researchers. Furthermore, we have established a global forum for pain patients, and I am proud that we have succeeded in integrating pain patients and patient associations to a much greater extent in the global advocacy campaign for better pain management worldwide.”

### **The long haul**

So far - so good. Many achievements have been reached for fibromyalgia patients and other chronic pain patients during the 30 years where Lars Arendt has been one of the pioneers in the field of pain research. When glancing at the many important milestones, the inevitable question is: When do these research results translate into new and more effective treatment methods?

Lars Arendt responds: “The research into epigenetics and the importance of the immune system for fibromyalgia patients may prove to be crucial milestones which provide future hope for new treatment options. Unfortunately, this is not going to happen in the very near future. As with all research, thorough clinical trials need to be conducted over a number of years before we can come up with new treatment methods. In other words, we are still facing the long haul.”

Every person living with the consequences of fibromyalgia dreams of the “ultimate treatment” becoming reality. However, it is not possible to conclude this article with any guarantees about the outcome of the research in fibromyalgia. But day by day, new pieces are linked in understanding the enigmatic puzzle of pain. With this gradual understanding, the invisible pain becomes more and more visible and this gives hope for a better life for all fibromyalgia patients.