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2009 : November 2009 - Fast Moving Fronts : Jan Nedergaard on Brown Adipose Tissue

FAST MOVING FRONTS - 2009

November 2009



Jan Nedergaard talks with *ScienceWatch.com* and answers a few questions about this month's Fast Moving Front in the field of Biology & Biochemistry. The author has also sent along images of his work.



Article: Brown adipose tissue: Function and physiological significance

Authors: Cannon, B;Nedergaard, J
 Journal: PHYSIOL REV, 84 (1): 277-359 JAN 2004
 Addresses: Stockholm Univ, Arrhenius Labs F3, Wenner Gren Inst, SE-10691 Stockholm, Sweden.
 Stockholm Univ, Arrhenius Labs F3, Wenner Gren Inst, SE-10691 Stockholm, Sweden.

SW: Why do you think your paper is highly cited? Does it describe a new discovery, methodology, or synthesis of knowledge?

It represents the most updated general and critical overview of what is known about brown adipose tissue physiology and the underlying cellular and molecular processes. It was published at a time which coincided with an accelerating interest in brown adipose tissue.

It's clearly a synthesis of knowledge, leading to the identification of several issues that require experimental clarification.

SW: Would you summarize the significance of your paper in layman's terms?

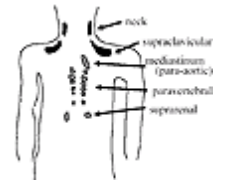
With many scientists entering the brown adipose tissue field, there is a necessity for an accessible source of information written by scientists with lengthy experience in the field. What we especially attempted in this paper was to arrive at clear statements on different discussed issues; these statements may not necessarily withstand the pressure of time, but they present the new worker in the field with a coherent picture of the scientific markers in this field.

SW: How did you become involved in this research and were any particular problems encountered along the way?

I have been working on brown adipose tissue for, at the time of the article's publication, nearly 30 years, and now even longer as I still pursue these issues. When I first became involved, it was in a purely scientific field of study



which was not intended to lead to benefits for mankind other than a greater general understanding. It has rewardingly turned out that this basic research—as with other types of scientific investigation—can often point toward developments of understanding which may lead to new avenues in practical life.



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SW: Where do you see your research leading in the future?

The developments in the field that occurred after this paper had been published have been impressive, with three major breakthroughs within the last several years: an unexpected understanding of the origin of the brown fat cells, demonstrations that the tissue actually protects against obesity and the realization that active brown adipose tissue is found in adult humans.

SW: Do you foresee any social or political implications for your research?

An understanding of one of the reasons for obesity—i.e., an absence of active brown adipose tissue—may reasonably be said to have potential social effects, especially if this knowledge can lead toward real possibilities to counteract obesity.

Jan Nedergaard, Ph.D.

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KEYWORDS: UNCOUPLING PROTEIN GENE; DIET-INDUCED THERMOGENESIS; SYMPATHETIC-NERVOUS-SYSTEM; COLD-ACCLIMATED RATS; MESSENGER-RNA EXPRESSION; CORTICOTROPIN-RELEASING-FACTOR; HORMONE-SENSITIVE LIPASE; BETA-ADRENERGIC STIMULATION; NON-SHIVERING THERMOGENESIS; GROWTH-FACTOR-I.



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