

news THE UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER AT DALLAS

southwestern medical school - graduate school of biomedical sciences - school of allied health sciences

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******University of Texas medical researcher
to speak on mitochondria, the "power-
houses" of the cell.*

DALLAS--Dr. Ronald Butow, professor of biochemistry at The University of Texas Southwestern Medical School, will participate in a symposium on cell mechanisms at the 1977 annual meeting of the American Association for the Advancement of Science, to be held Feb. 20-25 in Denver.

Dr. Butow will speak on biochemical and genetic aspects of mitochondria biogenesis, including both a summary of his research and a review of the area.

Mitochondria are cell components that have been aptly termed the "powerhouses" of the cell because their prime function is the release of biologically useful energy.

The recent discovery that mitochondria contain their own genetic material (DNA and RNA) and are able to synthesize proteins has led to the hypothesis that they are at least partly independent of control by the nucleus.

"Because the mitochondrion has its own chromosome, this provides us with an opportunity to study the interaction of two permanent genetic systems within the cell," Dr. Butow says.

"We are studying fundamental genetic mechanisms and what we learn will be of fundamental importance in understanding both normal and abnormal genetic activity."

Although it has been recognized for some time that mitochondria synthesize certain proteins, Dr. Butow's research this past year produced the first demonstration of the proteins' genetic origin.

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"We have been able to show that the genes for certain proteins are located on mitochondrial DNA," he says. "Because the mitochondrial DNA is relatively simple, it is possible to study certain aspects of genetic regulation in the complex cell that until now were unknown."

Evidence indicating that mitochondria are partially autonomous intracellular symbionts has led to a popular "symbiosis hypothesis," which says that mitochondria represent a primitive bacteria that one or two billion years ago entered the cytoplasm of the cell and were incorporated. One type evolved into the energy-producing organelles of all higher organisms, the mitochondria; the other, into the photosynthetic organelles of plants, called plastids.

Dr. Butow emphasizes that although it is an attractive theory, it remains unproven.

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