



RUTH LEHMANN, Ph.D.

MITOCHONDRIA: GERMLINE INHERITANCE
AND SELECTION

MARCH 21, 2019

4:00 P.M.

208 LIGHT HALL



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DEPARTMENT OF CELL AND DEVELOPMENTAL BIOLOGY

Upcoming Discovery Lecture:

GERARD FRANCISCO, M.D.

Wulfe Family Chair in Physical Medicine and Rehabilitation

Professor and Chair of PM&R, UTHealth McGovern Medical School

*Chief Medical Officer and Director of the NeuroRecovery Research Center
at TIRR Memorial Hermann*

March 28, 2019

208 Light Hall / 4:00 P.M.

VANDERBILT  UNIVERSITY
MEDICAL CENTER

MITOCHONDRIA: GERMLINE INHERITANCE AND SELECTION

Mitochondria are membrane-bound organelles in the cytoplasm of almost all eukaryotic cells. They are the power generators of the cell. Unlike other cellular organelles, mitochondria have two distinct membranes and their own genome (nucleoid), suggesting an evolutionary connection with bacteria. Mitochondria are highly dynamic and can fuse into large webs which contain many nucleoids and are energetically most efficient and can fragment into more individual units, which can be used for propagation during cell divisions. This lecture will focus on mitochondrial inheritance. In contrast to the nuclear genome of the offspring, which receives equal contributions from mother and father, mitochondria and their genome are only passed through the maternal germline (oocyte). It has been proposed that mitochondria need to be selected for quality in the germline to avoid successive degeneration and due to their critical role in energy production, possible extinction of the species. The mechanism of this selection is unclear. Using the fruitfly *Drosophila* as a model, we present data that suggest distinct mechanisms by which mitochondria become initially enriched in primordial germ cells, the precursors of egg and sperm, and by which they are selected on the basis of their functionality during early stages of oogenesis.



RUTH LEHMANN, Ph.D.

CHAIR, DEPARTMENT OF CELL BIOLOGY AND DIRECTOR,
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INVESTIGATOR, HOWARD HUGHES MEDICAL INSTITUTE

Dr. Lehmann is an investigator of the Howard Hughes Medical Institute and Professor and Chair of the department of Cell Biology at NYU Langone Medical Center, where she directs the Skirball Institute for Biomolecular Medicine. Dr. Lehmann received her Ph.D with Nobel Laureate Dr. Christiane Nüsslein-Volhard at the Max Plank Institute in Tübingen, Germany. After postdoctoral training at Medical Research Council in Cambridge, UK, she joined the Whitehead Institute and the faculty of MIT, before she was recruited to the newly founded Skirball Institute at NYU in 1996.

Her research focuses on germ cells, the only cells in the body able to give rise to a new generation. Research in her laboratory focuses on reproductive biology. Germ cells, the cells that mature into egg and sperm, are the only cells in the body with the potential to naturally generate a completely new organism. The lab has made important discoveries in understanding how germ cells are specified in the early embryo and how they maintain the potential for totipotency while differentiating into egg and sperm in the adult. Dr. Lehmann is a member of the American Academy of Arts Sciences and the National Academy of Sciences.
