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Genetic map reveals clues to degenerative diseases

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An international research team, spearheaded by Dr. Tim Mercer from The University of Queensland's Institute for Molecular Bioscience (IMB), has unlocked the blueprints to the ‘power plants' of the cell in an effort that will provide clues on treating a range of degenerative diseases.

The scientists, from UQ, the University of Western Australia and the University of Washington (Seattle), mapped the transcriptome of the human mitochondrion, which supplies energy to the body's cells.

Professor John Mattick of UQ's IMB, one of the leaders of the study, said the genome was like a static set of plans for the mitochondria's genetic function, while the transcriptome revealed which genes were active at particular points in time.

“This is the first highly detailed map of the human mitochondrial transcriptome, as well as insights into its control mechanisms, and will provide an important resource for the future study of mitochondrial function and disease,” he said.

“By examining which genes are being expressed under various environmental conditions, such as in healthy cells versus infected cells, we can determine the changes in gene activity that may indicate or cause disease.”

Mutations in mitochondrial DNA lead to a range of disorders, many of which affect the nervous and muscular systems.

The information the team has compiled will provide an improved framework to analyse how genetic mutations in the mitochondria affect gene activity and thus the body itself.

The study is published in the current edition of the leading science journal *Cell*, while the data sets are accessible at the mitochondria-specific genome browser mitochondria.matticklab.com .

Provided by University of Queensland