



foundation of

molecular medicine

THE POWER TO CURE

Mitochondrial Disorders:

What happens when energy production fails?

Mitochondrial disorders are complex inherited disorders that affect the body's ability to adequately produce energy. These disorders affect at least 1 in 5,000 individuals and are difficult to diagnose. Many patients are left for months or years to struggle with no answers, with complex medical symptoms, and with little support from the medical community.

Recent research indicates that mitochondrial dysfunction contributes to a number of well-known disorders including Parkinson's, Alzheimer's, Huntington's disease, ALS, certain types muscular dystrophy, as well as certain types of deafness, diabetes and heart failure.

When the mitochondria fail to function properly and the energy production inside the cells of our body decreases, it is similar to a major city's power plant failing causing either isolated or widespread problems. Normally, the human body breaks down foods to form energy packets known as ATP that are needed to perform all of its bodily functions. This ATP is created by a series of enzymes in a process called **oxidative phosphorylation**. These enzymes live inside of the mitochondria and are responsible for making ATP (i.e. making mitochondria function like tiny batteries).

Mitochondrial diseases cause a decrease in energy production that generally affects brain and muscle most severely. However, symptoms are diverse and may include growth difficulties, developmental delays, autism, mental retardation, movement disorders, seizures, vision loss, deafness, heart disease, kidney disease, and liver disease.

The prognosis of a particular mitochondrial disorder varies significantly among individuals. In most cases, the mitochondrial disease produces lifelong symptoms but does NOT result in death.

The mission of The Foundation of Molecular Medicine's is to advance research protocols designed to treat mitochondrial disease patients or for research protocols that are likely to lead to treatment. The Foundation of Molecular Medicine is a nonprofit organization and all donations are tax deductible.

Scientific direction is provided by Dr. John Shoffner and Dr. Keith Hyland who bring over 20 years of clinical and research experience to the foundation. They have published extensively and are highly regarded nationally and internationally for their work. With the help and efforts of others, they are dedicated to promoting awareness and improving the lives of the patients affected with these diseases.

*On behalf of the many children and families who face the challenges of these disorders,
please accept our appreciation for considering supporting the efforts of the Foundation of Molecular Medicine.*