



SCOTTISH RITE CHARITABLE FOUNDATION
VALLEY LIAISON COMMITTEE

We have heard a great deal about autism or Autism Spectrum Disorder (ASD) over the past many months, in large part related to its predominance whereby it is recognized as existing in an estimated 1 in 66 Canadian children. Our understanding of ASD is complicated by the fact that a combination of diverse factors such as genetic background and environmental exposure are thought to contribute to its development. Currently, there is growing evidence for a link between ASD and mitochondrial dysfunction. Dr. Tim Schutt is a researcher at the University of Calgary who is looking into this connection and who has been awarded a research grant from our Scottish Rite Charitable Foundation.

Mitochondria are best known as the cellular components that produce the bulk of the cell's energy. Importantly, many of the same factors thought to cause ASD also result in mitochondrial dysfunction. Research findings suggest that mitochondrial dysfunction underlie a significant proportion of ASD with estimates suggesting its occurrence in 30 to 50% of those with ASD. That mitochondria are involved in ASD should not be surprising as they provide energy for the brain and play essential roles in brain development. Although the exact role of mitochondrial dysfunction in ASD remains undefined, targeting mitochondrial dysfunction is nonetheless a promising therapeutic approach.

One way to improve mitochondrial dysfunction is by changing the food source they are given. To this end, the high-fat, low carbohydrate ketogenic diet (KD), is a therapeutic approach that is beneficial in a growing list of neurological disorders with mitochondrial dysfunction. Importantly, the KD shows behavioural benefits in ASD patients. Despite this exciting finding, we do not understand exactly how this occurs. Further highlighting the need for a better mechanistic understanding to develop alternative approaches, the KD is not without side effects and comes with implementation challenges, particularly in children.

The objective of Dr. Schutt's research is to understand how the KD improves mitochondrial structure and function, and to evaluate its applicability to ASD. He will endeavour to clarify mechanisms through which the KD improves mitochondrial structure and function by determining how metabolic products generated by the KD regulate the structure of mitochondria.

While this may not lead to a cure for ASD, the goal is to find a way to help deal with it. In addition to the stress that a child with ASD puts on a family, children with ASD also add a burden to the educational system and the economy. In 2001, the lifetime cost per Canadian with an autism condition was estimated at \$2 million, with an overall Canadian annual cost estimated at more than \$3 billion. While identification and treatment can reduce the impact of ASD, there is no cure, in part, because we do not understand the cause.

This is but another example of how your donations to the Scottish Rite Charitable Foundation are, in turn, working towards "Solving the Puzzles of the Mind". To read more about this intriguing research visit the Foundation website at www.srcf.ca and remember to use the blue envelope to make your donation!

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