

## **Metabolic Memory and Potential Therapeutics**

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Retinopathy is a microvascular disease which plaques most of the diabetic patients. The major causative factor in the development of retinopathy is the sustained hyperglycemia leading to disrupted normal cellular metabolisms, but the exact mechanism remains elusive. Diabetes Control and Complications Trial and Epidemiology of Diabetes Interventions and Complications studies have shown that the deleterious effects of hyperglycemia on the pathogenesis of retinopathy continue for a considerable period, and the benefits of good glycemic control persist beyond the period of maintenance of the glycemic control. This 'metabolic memory' is stored early in the course of diabetes, and glycemic control initiated prior to the onset of overt pathology is considered to have the most profound long-term impact, and animal models of diabetic retinopathy have duplicated this phenomenon. Animal studies have shown that the histopathology associated with diabetic retinopathy continues to progress in rats for at least six months after re-institution of good glycemic control that has followed six months of poor glycemic control, retinal mitochondria remain dysfunctional and apoptosis of capillary cells continues. Elucidation of the mechanism responsible for the progression of diabetic retinopathy has revealed that oxidative stress and inflammation have important contributing roles. Direct inhibition of such abnormalities should offer patients an opportunity to supplement their best possible sensible glycemic control with additional therapies to prevent/retard the progression of diabetic retinopathy.