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The effect of *Garcinia kola* seed extract on the development of disease in an autoimmune mouse model of type-1 diabetes

Type-1 Diabetes (T1D) is an insulin-dependent autoimmune disease characterized by T-cell mediated autoimmune destruction of insulin-producing pancreatic β -cells. *Garcinia Kola* Heckel (GK), or bitter kola, is a medicinal plant found in Central and Western Africa, which seeds' extract (GKE) has been proposed to exhibit anti-inflammatory and hypoglycemic properties. Considering that GKE has never been studied in the context of T1D and its enormous relevance in folkloric medicine, we aimed to define whether GKE exhibits anti-diabetic properties and affects T-cells by its anticipated anti-inflammatory action. Thus, it is hypothesized that GKE treatment would prevent development and reduce the severity of T1D in an experimental mouse model, low-dose Streptozotocin (STZ)-induced autoimmune T1D, by affecting pathogenic T-cells. Aqueous- and ethanol-based GKE were extracted and administered orally (via drinking water) to C57BL/6 male mice in a dose of 100 mg/kg/day from 7 to 12 weeks of age. At 8 weeks of age, T1D was chemically induced by five consecutive injections of 40 mg/kg STZ. Body weights and blood glucose levels were measured before STZ administration and bi-weekly from day 8 until day 29 post first STZ injection. GKE mechanisms of action in the context of T-cells, such as the effect of GKE on T-cell populations/subpopulations and T-cell function (proliferation assays and cytokine profiles), was studied as well at two endpoints during disease development. The results showed that GKE treatment did not reduce body weights and glycaemia; even a trend of elevated body weights and hyperglycemia levels was observed in GKE-treated mice. Surprisingly, while decreasing T-cell populations/subpopulations, GKE exposure significantly increased T1D incidence in STZ-treated mice. In conclusion, this study, as the first examination of the anti-diabetogenic potential of GKE in T1D, did not confirm its potential in a reduction of hyperglycemia and prevention of T1D.

Biography

Marina Cetkovic-Cvrlje is a Professor of Immunology in the Department of Biology, Saint Cloud State University, USA. She has devoted her entire career to autoimmune Type-1 Diabetes (T1D) research. Since joining SCSU, she has established a Laboratory for Immunology, providing research opportunities for numerous undergraduate and graduate students to study effects of various environmental compounds on the development of autoimmune diabetes in murine models of T1D. She has been teaching immunology, pathophysiology and public health controversies and has been a strong advocate for raising awareness about effects of environmental compounds on T1D.

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