Abstract

The main aim of this work is to refer a recent summary of the opportunities and pitfalls of the application of tolerogenic dendritic cells in the prevention or therapy of type 1 diabetes (T1D). Tolerogenic dendritic cells (TolDCs) represent a potential tool for the treatment of allergies, transplant rejections and autoimmune diseases, including T1D, due to their capability to specifically inhibit autoimmune reactions without causing general immunosuppression. TolDCs represent a specific group of dendritic cells and are essential in establishing central and peripheral tolerance. This work presents a helpful guide to better understanding the physiology of tolerogenic DCs and an overview of in vitro generation attempts. In addition, the route of application and migration to target organs has been described.

Type 1 diabetes (T1D) is a chronic disease resulting from immune-mediated destruction of the insulin-producing beta cells in the pancreas. Animal models have been invaluable in testing innovative medical treatments since the early testing of insulin in dogs almost a century ago. Animal models of type 1 diabetes (T1D) enable the study of the mechanisms underlying its pathogenesis and the potential development of therapeutic interventions. However, there are still significant gaps in our general understanding of type 1 diabetes and in our capability to reduce the complications and inconveniences associated with the disease.

Key words

Tolerogenic dendritic cells, type 1 diabetes, cell therapy, prevention, translational research, animal models