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*“Examination of human spleens for a *Hox11* expressing stem cell involved in salivary epithelial regeneration”*

LAY ABSTRACT:

A unique stem cell in the capsule of the spleen has been identified by several groups in both rats and mice. This splenic stem cell, under certain circumstances, can directly or indirectly contribute to the growth of islets, bone and salivary glands in animals. This project focuses on a current topic relevant to Sjögren’s syndrome. Do humans have the same splenic stem cells that might differentiate into salivary epithelial cells as observed in rodents?

We know that, in the diabetic and Sjögren’s-like syndrome NOD mouse, this splenic stem cell massively proliferate in the spleen with salivary damage. This stem cell with mobilization can also contribute to the regenerative process in the salivary glands of mice by secretion of growth factors or by a direct change in to a salivary cell.

In this proposed project, we want to identify whether this spleen stem cell is present in human spleens of all ages. Further, we will look at the spleens of people with Sjögren’s syndrome to see if, similar to the mouse, a human with Sjögren’s syndrome has the capacity to expand this cell in the spleen.

SCIENTIFIC ABSTRACT AND RESEARCH PROPOSAL:

Hox11 is a proto-oncogene originally identified in human T cell leukemia. Later, *Hox11* was found to be expressed in normal fetal development. Recently, *Hox11*-expressing spleen cells of adult mice/rats were shown by four international groups to be multi-potent stem cells with the ability, under select conditions, to differentiate into insulin secreting islets, salivary epithelial cells, and bone. Benefits of the spleen contributing to restoration of salivary damage in the mouse have also been reported. We investigate here whether human spleens have a similar population of stem cells characterized by vivid *Hox11* expression. Not only will human spleens be investigated based on age and sex, but also specific studies will be directed towards spleens from humans with Sjögren’s syndrome. As the preliminary data for this grant show, NOD mice affected with Sjögren’s-like syndrome and early type 1 diabetes have a large induction of *Hox11* expression and expansion of the *Hox11*-containing cells in the spleen. Human spleens will be studied using RT-PCR analysis and DNA quantitative analysis for *Hox11* expression. We ask the important question: are *Hox11*-expressing stem cells found in abundance in the spleen of humans of all ages and how does active autoimmune Sjögren’s syndrome influence the production of these stem cells?

