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Effects of green tea polyphenols on murine transplant-reactive T cell immunity

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Green tea polyphenols, the active ingredient of green tea, may have immunosuppressive properties, but whether and how green tea polyphenols affect transplant-reactive T cells is unknown.

This work represents the tested effects of green tea polyphenols on in vitro and in vivo transplant-reactive T cell immunity.

In cell cultures, green tea polyphenols inhibited IFN- γ secretion by cultured monoclonal T cells and by alloreactive T cells in mixed lymphocyte reactions without increasing monoclonal T cell apoptosis until concentrations $> 15\mu\text{g/ml}$ were reached.

Furthermore, green tea did not effect the ability of macrophages to present antigen to monoclonal T cells in in-vitro cultures, yet apoptosis seemed to be higher in macrophages at concentrations of green tea polyphenols exceeding $10\mu\text{g/ml}$.

When mice were fed green tea polyphenols dissolved in drinking water, oral green tea polyphenols significantly prolonged minor antigen-disparate skin graft survival and decreased the frequency of donor-reactive interferon gamma-producing T cells in recipient secondary lymphoid organs compared to controls.

In sensitized mice, however, oral treatment with green tea polyphenols did not affect second set skin graft rejection or donor-reactive IFN- γ production in an IFN- γ ELISPOT assay.

In contrast to other hypothesized actions, oral green tea polyphenols did not alter dendritic cell trafficking to lymph nodes as measured by flow cytometric analysis of cells found in the draining lymph nodes of mice after skin grafting in the presence or absence of orally fed green tea polyphenols.

This work constitutes a report of an immunosuppressive effect of green tea polyphenols on transplant-reactive T cell immunity.

The results suggest that oral intake of green tea could act as an adjunctive therapy for prevention of transplant rejection in humans.