Regulatory T cell

Function: Tregs are a subset of T cells that suppress the activity of other immune cells, including T cells and antigen-presenting cells. They play a crucial role in maintaining immune tolerance and preventing autoimmune responses.

Markers: CD4+, CD25+, FoxP3+.

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see Regulatory T cell in aneurysm.

The regulatory T cells, formerly known as suppressor T cells, are a subpopulation of T cells which modulate the immune system, maintain tolerance to self-antigens, and prevent autoimmune disease. Tregs are immunosuppressive and generally suppress or downregulate induction and proliferation of effector T cells.

Tregs express the biomarkers CD4, FOXP3, and CD25 and are thought to be derived from the same lineage as naïve CD4 cells.

Because effector T cells also express CD4 and CD25, Tregs are very difficult to effectively discern from effector CD4+, making them difficult to study. Recent research has found that the cytokine TGFβ is essential for Tregs to differentiate from naïve CD4+ cells and is important in maintaining Treg homeostasis.

FOXP3 appears to function as a master regulator of the regulatory pathway in the development and function of regulatory T cells.

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evaluated circulating levels of immunosuppressive regulatory T cells (Tregs) and other lymphocyte subsets in patients with newly diagnosed medulloblastoma (MBL) undergoing surgery compared to a control cohort of patients undergo craniectomy for correction of Chiari malformation (CM) and further determined the impact of standard irradiation and chemotherapy on this cell population. METHODS: Eligibility criteria for this biologic study included age 4-21 years, patients with CM undergoing craniectomy (as non-malignant surgical controls) and receiving dexamethasone for prevention of post-operative nausea, and those with newly diagnosed posterior fossa tumors (PFT) undergoing surgical resection and receiving dexamethasone as an anti-edema measure. Patients with confirmed MBL were also followed for longitudinal blood collection and analysis during radiotherapy and chemotherapy. RESULTS: A total of 54 subjects were enrolled on the study [22-CM, 18-MBL, and 14-PFT]. Absolute number and percentage Tregs (defined as CD4+CD25+FoxP3+CD127low/-) at baseline were decreased in MBL and PFT compared to CM [p = 0.0016 and 0.001, respectively). Patients with MBL and PFT had significantly reduced overall CD4+ T cell count (p = 0.0014 and 0.0054, respectively) compared to those with CM. Radiation and chemotherapy treatment in patients with

MBL reduced overall lymphocyte counts; however, within the CD4+ T cell compartment, Tregs increased during treatment but gradually declined post therapy.

The results demonstrate that patients with MBL and PFT exhibit overall reduced CD4+ T cell counts at diagnosis but not an elevated proportion of Tregs. Standard treatment exacerbates lymphopenia in those with MBL while enriching for immunosuppressive Tregs over time [1].

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Gururangan S, Reap E, Schmittling R, Kocak M, Reynolds R, Grant G, Onar-Thomas A, Baxter P, Pollack IF, Phillips P, Boyett J, Fouladi M, Mitchell D. Regulatory T cell subsets in patients with medulloblastoma at diagnosis and during standard irradiation and chemotherapy (PBTC N-11). Cancer Immunol Immunother. 2017 Aug 20. doi: 10.1007/s00262-017-2051-6. [Epub ahead of print] PubMed PMID: 28825123.