**T-Cells and the Burn Wound Inflammatory Response**

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**Introduction:** Burn induces an immunopathological response involving multiple immune cell types, including T-cells. Recently our laboratory has shown that a T-cell subset known as γδ T-cells are important in burn wound inflammatory and healing responses. Nonetheless, their role in the regulation of other immune cells at the wound site remains ill-defined.

**Methods:** Wildtype (WT) and γδ T-cell deficient (δTCR−/−) mice were subjected to major burn (25% TBSA, 3rd degree) or sham treatment. At 3 days thereafter, skin samples were assayed for cytokine content or used to isolate single cells that were used characterization by flow cytometry.

**Results:** The majority of T-cells in the skin of sham mice were γδ T-cells (80% - 90% of the total T-cells). After burn, there was a significant increase in the total T-cells at the wound site and these infiltrating T-cells were overwhelmingly αβ T-cells (~95%). While the percentage of γδ T-cells in the overall T-cell population at the injury site decreased, their numbers remained comparable to that found in sham skin. Furthermore, the γδ T-cells in the burn wound were activated with increased expression of toll-like receptors (which are important in the early immune response). In addition the number of myeloid cells increased by ~75% in the wound skin of WT mice. This influx was due to increased myeloid-derived suppressor cells (CD11b*GR1+) whose numbers increased 19-fold compared to sham skin. In contrast, macrophage (CD11b+F4/80+) numbers decreased by ~50% after burn. Burn wound infiltration by αβ T-cells and myeloid cells was regulated by γδ T-cells, as a 4-fold decrease in the αβ T-cells infiltration and a 5-fold increase in myeloid cell numbers was observed in burn injured mice lacking γδ T-cells.

**Conclusions:** Burn is associated with γδ T-cell activation at the wound site that regulates the infiltration of the wound with other immune cell types and likely facilitates the transition from the inflammatory to the proliferative phase of healing.