Immunopathology in schistosomiasis is controlled by antigen-specific regulatory T cells primed in the presence of TLR2.

Regulatory T cells (Treg) are vital in maintaining the homeostasis of immune reactions. In chronic infections, such as schistosomiasis, it remains unclear whether engagement of the TLR family is required to induce Treg activity. Thus, we performed in vivo studies using TLR2−/− mice infected with Schistosoma mansoni and found elevated immunopathology, decreased egg burden and extended antigen-specific Th1 responses. Simultaneously, the population of Treg failed to expand. To evaluate the role of Treg during infection, we functionally inactivated CD4+CD25+ T cells and observed that the resulting immunopathology mirrored that in TLR2−/− mice. Egg burden was also reduced in anti-CD25-treated mice, indicating that without Treg eggs are more efficiently destroyed. In addition, antigen-specific T cells from both TLR2−/− and anti-CD25-treated mice displayed an extended Th1 phase. Finally, adoptive transfer of schistosome-primed, but not naive CD4+CD25+ T cells was able to resolve the immunopathology in TLR2−/− recipients and interestingly, this amelioration was independent of TLR2 being present on the transferred Treg. We conclude that TLR2 is necessary for priming active Treg and their expansion during schistosomiasis.