**Background** Tumor-specific CD8+ T-cells play a critical role in tumor control, as demonstrated by the success of immune checkpoint inhibitors and adoptive cell therapy. Studies of mice and human tumor-infiltrating lymphocytes (TILs) demonstrate that tumor-specific CD8+ TILs can be defined by CD39 expression on their surface. CD39 is commonly considered an immunosuppressive enzyme, as it depletes ATP. However, CD39 is also associated with mitigating activation-induced cell death and mediating leukocyte trafficking. It is, however, unclear whether CD39 expression on tumor-specific T-cells can be regulated by putative anti-tumor factors such as pro-inflammatory cytokines similar to the phenotype and anti-tumor properties of CD8+ TILs. IL-12 and IL-27 have established roles in promoting effector T-cell differentiation, expansion, and cytotoxic activity. Both cytokines are implicated in the upregulation of CD39 by T regulatory cells, suggesting they may regulate CD39 expression in other cell types, including tumor-specific CD8+ T-cells. We hypothesize that IL-12 and IL-27 induce CD39 upregulation on CD8+ T-cells, modulating their anti-tumor properties.

**Methods** An engineered immunogenic, syngeneic neuroblastoma (neuro-2a) mouse model was used for in vitro and in vivo experiments. CD8+ T-cells or bulk splenocytes isolated from naïve or neuro-2a vaccinated mice were stimulated in vitro using anti-CD3/CD28 Dynabeads and IL-2 ± IL-12 or IL-27. Flow cytometry was used to determine the phenotype of CD8+ T-cells and assess effector activity. Additionally, we inhibited IL-12 activity in vivo to study the effect on CD8+ TIL expression of CD39. An isotype control antibody was administered to a separate group to act as a control.

**Results** Our in vitro results demonstrate that CD8+ T-cells stimulated in the presence of IL-12 or IL-27 had higher expression of CD39 compared to stimulated controls. In addition, we found a higher frequency of CD39+CD8+ T-cells expressing IFNγ and CD107a than CD39- counterparts. Finally, blocking IL-12 activity in vivo reduced CD39+CD8+ TIL frequency compared to the isotype control group.

**Conclusions** Our results establish that IL-12 and IL-27 induce CD39 expression on CD8+ T-cells and blocking IL-12 reduced CD39+CD8+ TIL frequency. Furthermore, CD39 expression is associated with improved effector CD8+ T-cell function. Future experiments will assess the functionality of CD39+CD8+ T-cells using ex vivo cytotoxicity assays. Data generated in this study will provide novel information on the mechanism of CD39 induction and its effect on CD8+ T-cell function, which can be exploited to improve future cancer therapies.