The abundance and proliferation status of SIV-specific CD8 cells in lymphoid tissues from rhesus macaques vaccinated with live attenuated SIVΔnef and challenged with the pathogenic SIVmac251

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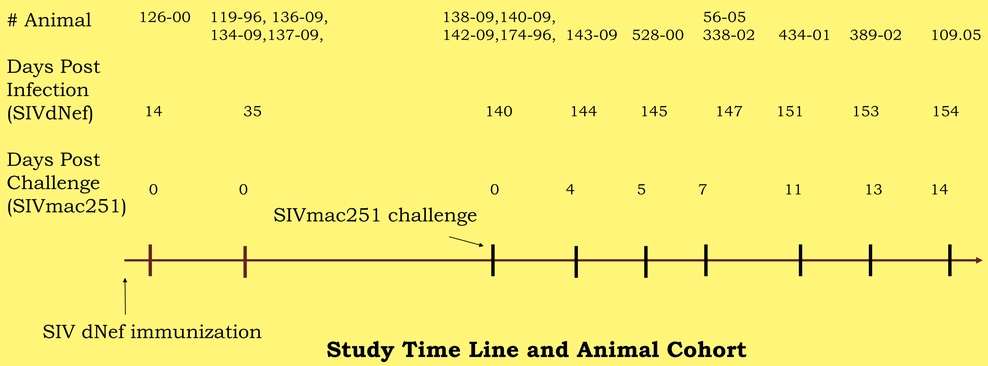
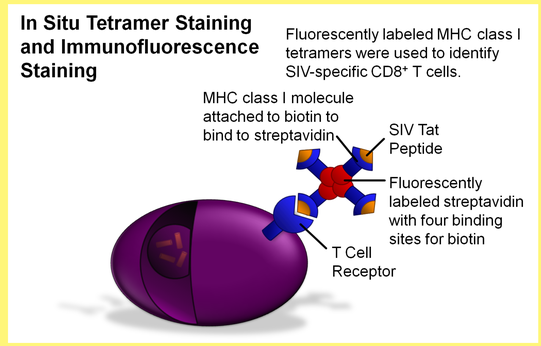
Introduction

Over 30 million people are infected with HIV/AIDS today. There is an urgent need to develop an effective vaccine. Simian immunodeficiency viruses (SIVs) in rhesus macaques serve as a valuable animal model of HIV infection. Live attenuated SIVs provide protection in SIV infected rhesus macaques challenged with highly pathogenic SIV. The goal of this experiment is to identify correlations of protection that is provided by SIVΔnef vaccination. We determined the activation/proliferation status of SIV-specific CD8 T-cells in situ in lymph nodes and spleen tissues from SIVΔnef vaccinated rhesus macaques before and after challenge with the pathogenic SIVmac251.

Methods



Study Time Line and Animal Cohort

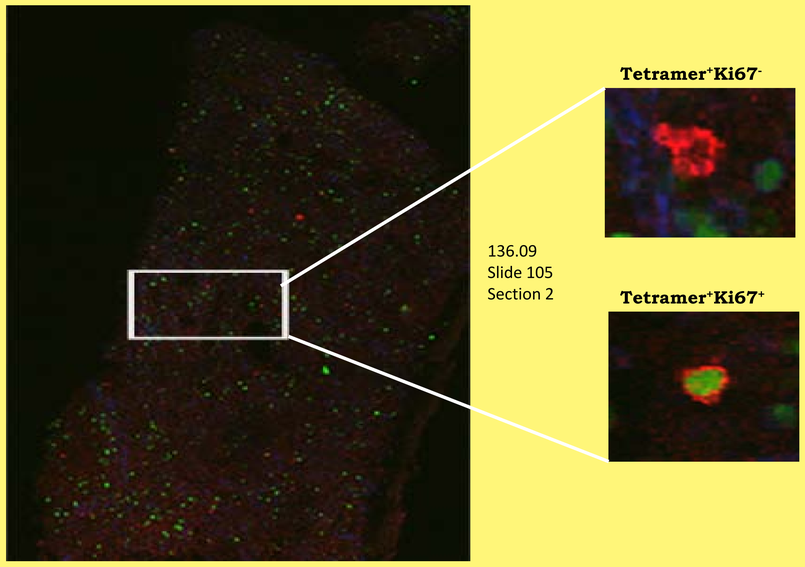


Art by Kristopher Schwebler

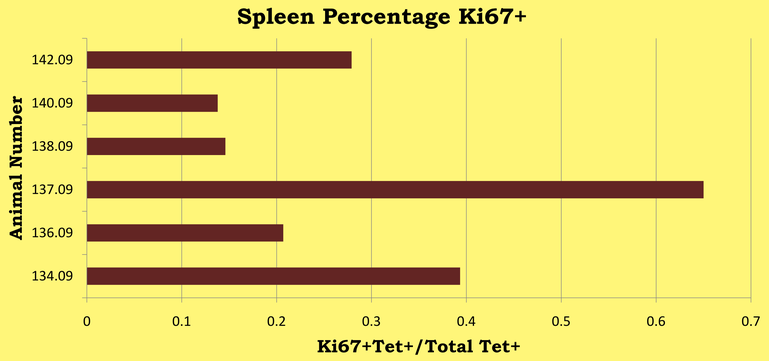
•Confocal images were obtained from tissues stained with MHC-tetramers that stain SIV-specific CD8 T cells and Ki67 antibodies that stain proliferating cells and activated T cells.
•We collected 4-18 20X fields at multiple z-scan depths into the sections and stitch together multiple fields to form 3D montages.
•We determined the percent of the MHC-tetramer stained cells that expressed Ki67.

Results

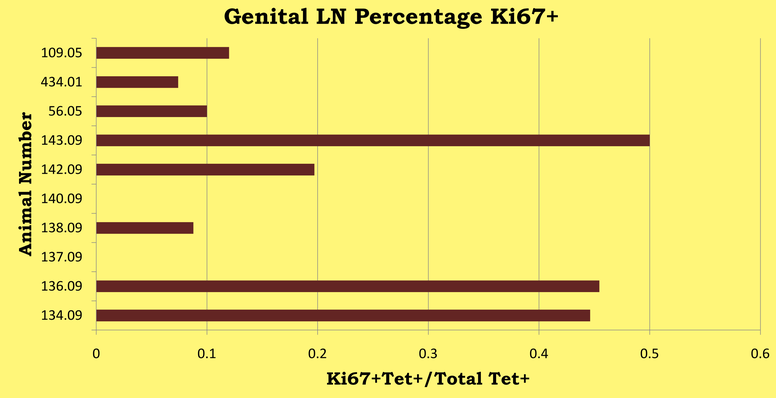
Representative confocal montage image of Tat tetramer and Ki67 staining in spleen tissue
Red: Tat Tetramer Staining
Green: Ki67
Blue: CD3+



The percent of tetramer stained cells that were Ki67+ in the spleen



The percent of tetramer staining cells that were Ki67+ in the genital lymph node



Conclusions

We found similar numbers of SIV-specific CD8 T cells, and similar percentages of SIV-specific CD8 T cells that expressed Ki67 before and after challenge. These results show that 1) SIV-specific CD8 T cells were present in lymphoid tissues at the time of challenge, and 2) no expansion of SIV-specific CD8 T cells in lymph nodes and spleen was required for protection. This study yields insights into CD8 T cell responses that are likely needed to be induced by a successful HIV vaccine.

Acknowledgements

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