

CD4⁺ T cell-derived NGAL mediates ischemia reperfusion-induced AKI

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PGY-1 / MetroWest Medical Center

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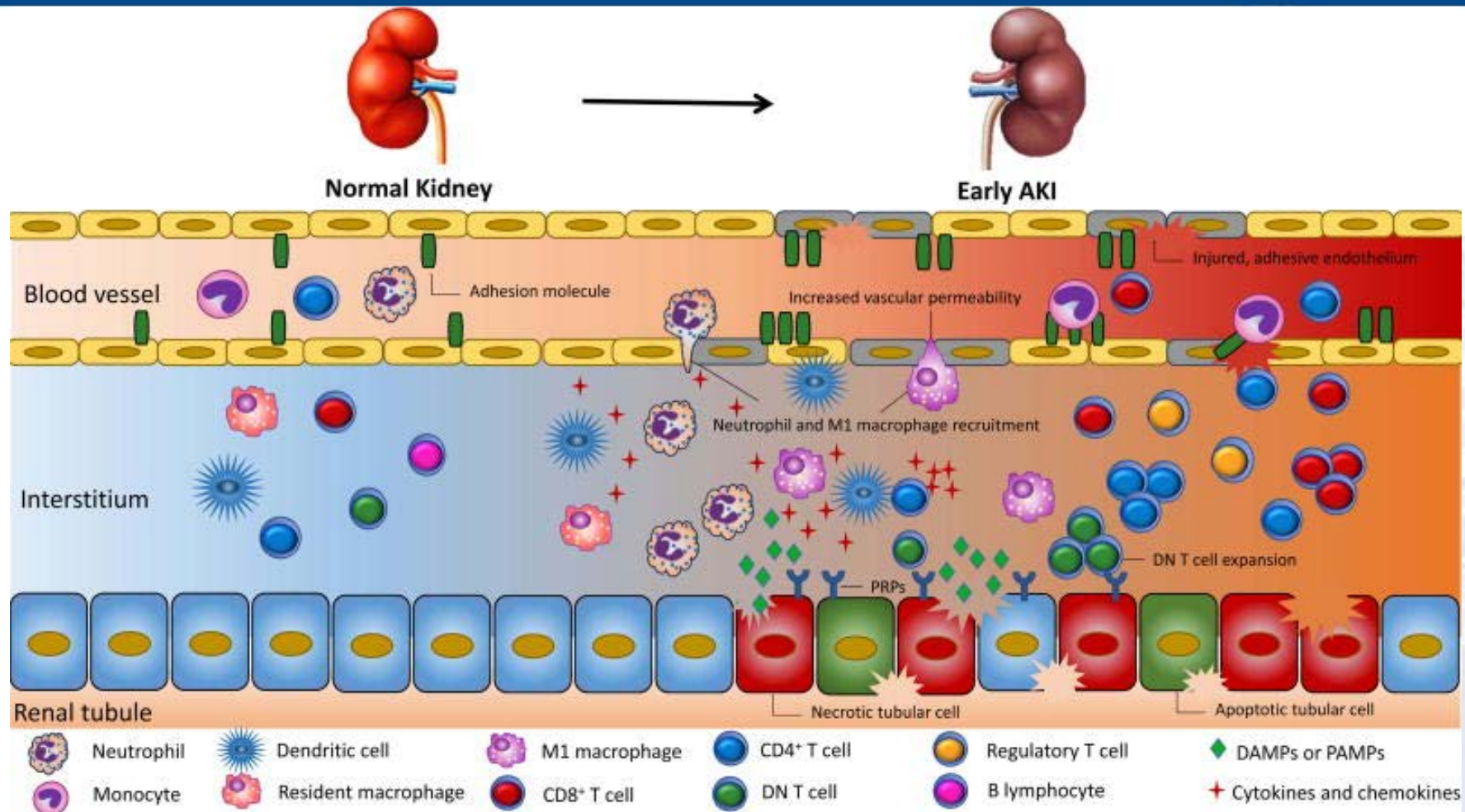


JOHNS HOPKINS
M E D I C I N E

Disclosures

- Nothing to disclose

Background

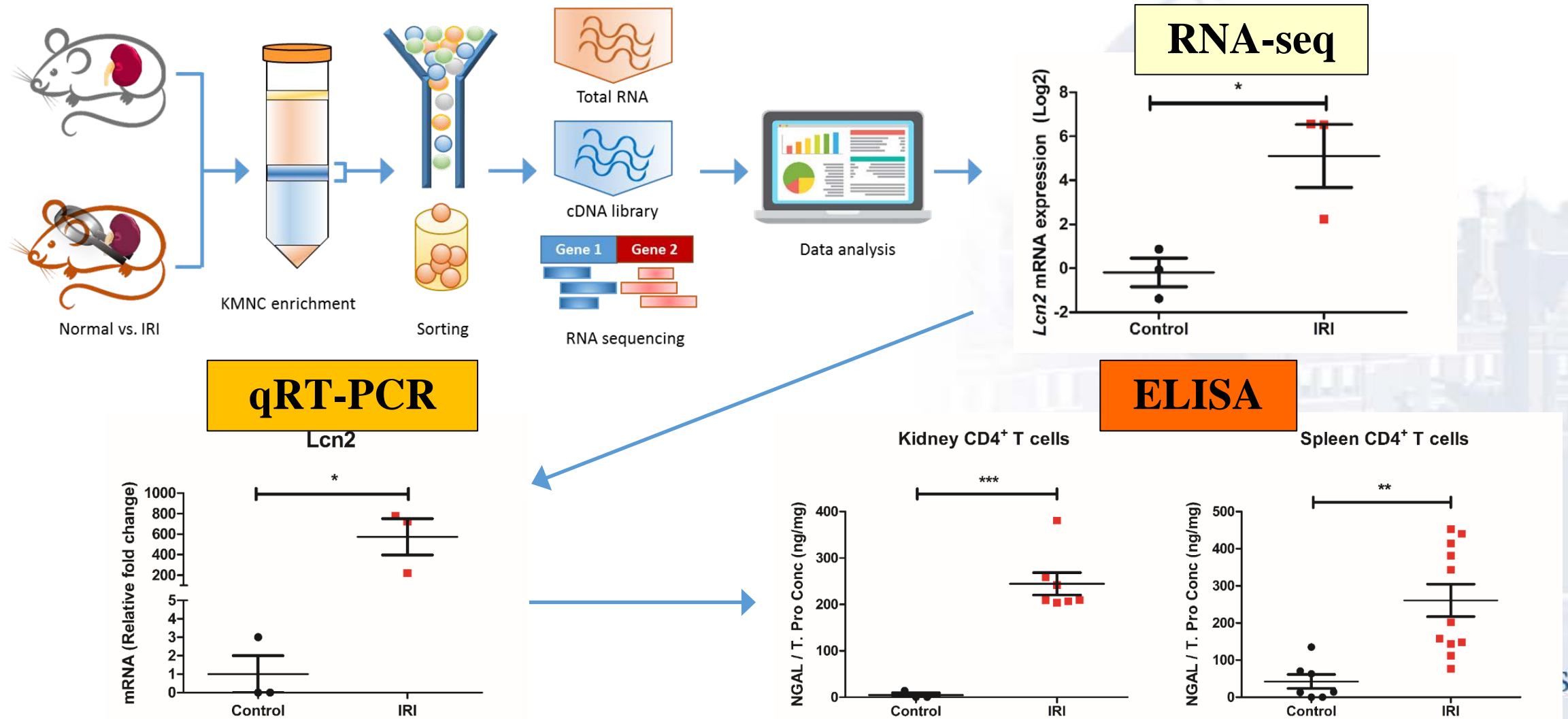


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Q1. How do CD4 T lymphocytes mediate the course of ischemic AKI



Lcn2/NGAL markedly increases in kidney CD4⁺ T cells following IR-induced AKI

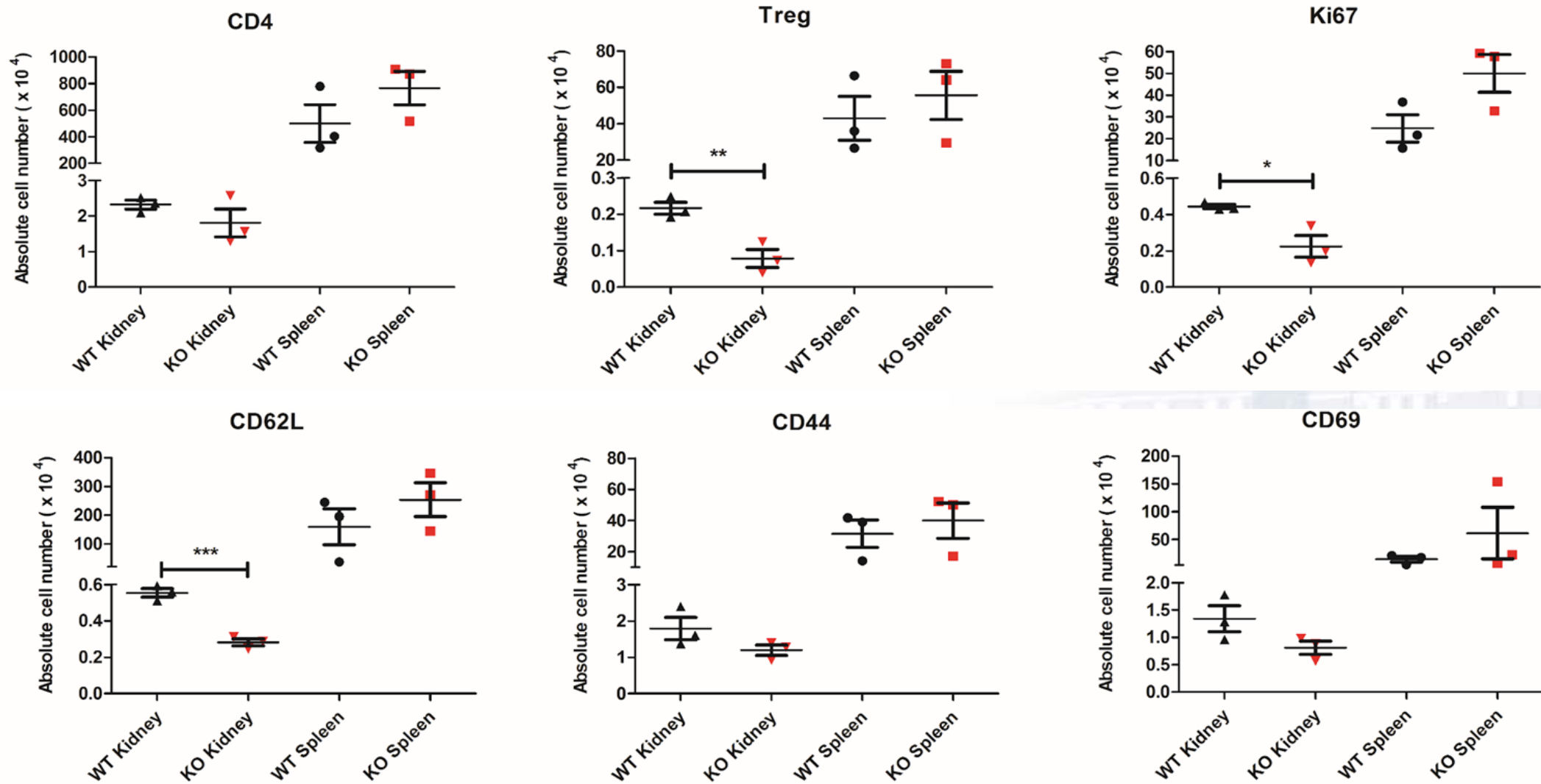


Q1. How do CD4 T lymphocytes mediate the course of ischemic AKI

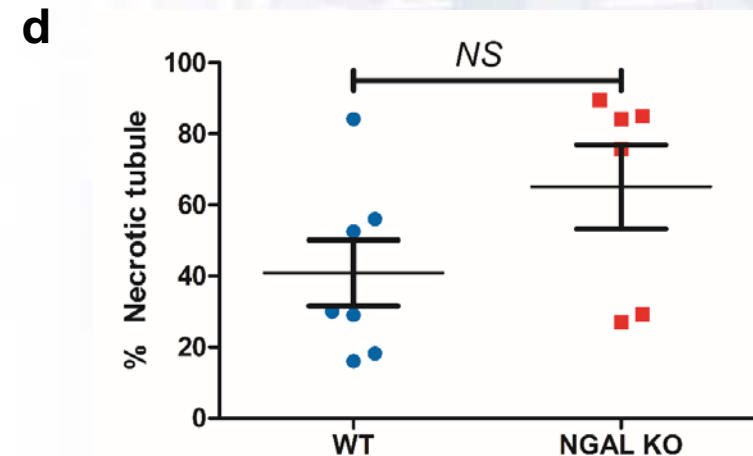
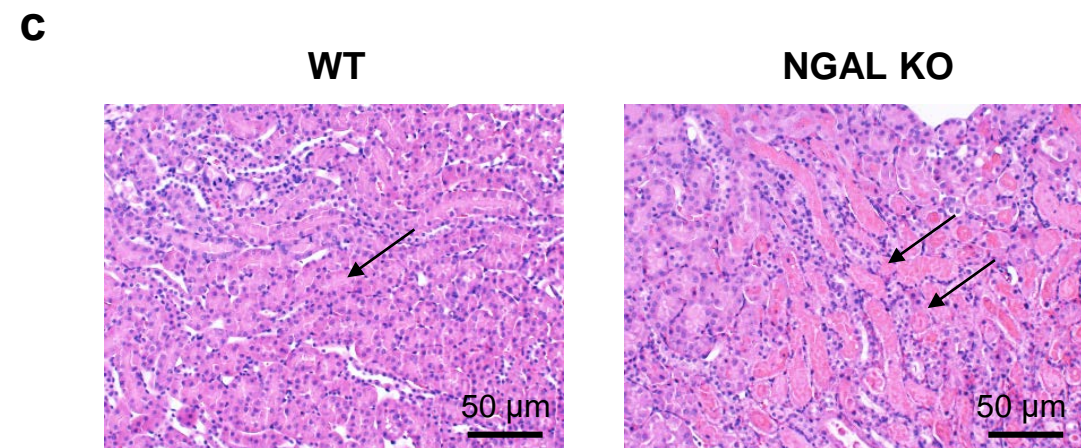
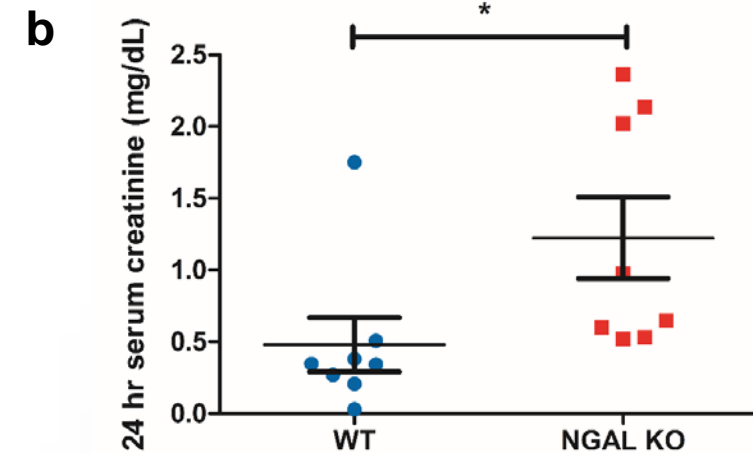
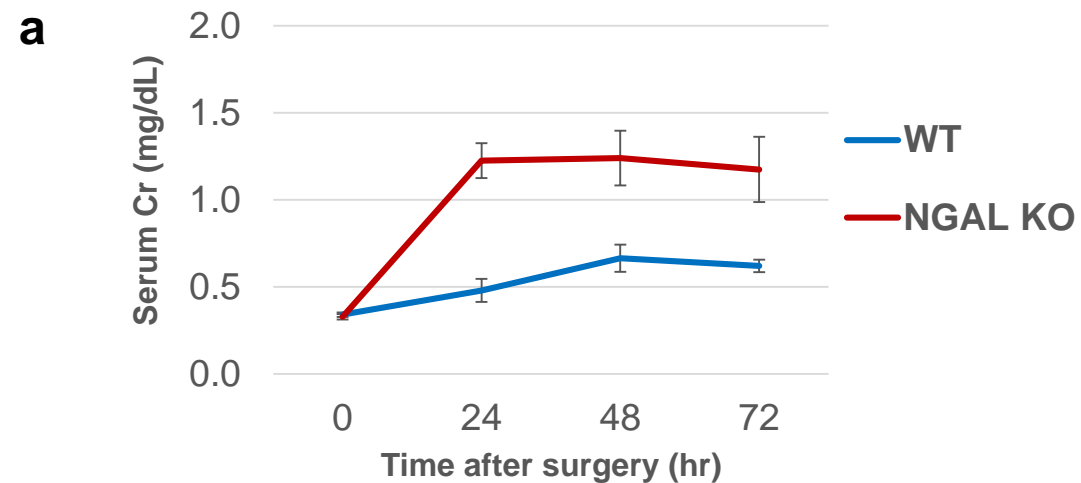
Q2. Does CD4 T cell NGAL serve any role in the course of ischemic AKI



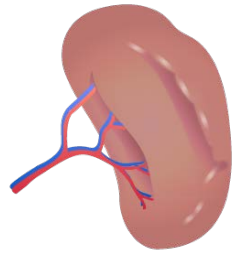
Comparison of kidney & spleen CD4⁺ T cells from WT and NGAL KO mice



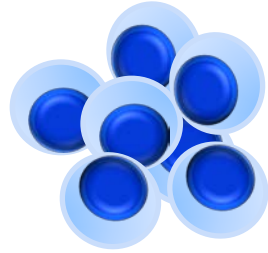
Lcn2/NGAL deficiency augments susceptibility to ischemic AKI in mice



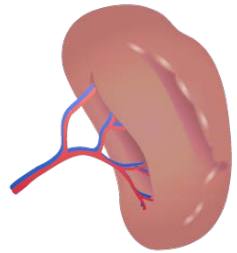
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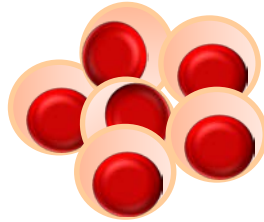
WT



WT CD4⁺ T cells



NGAL KO

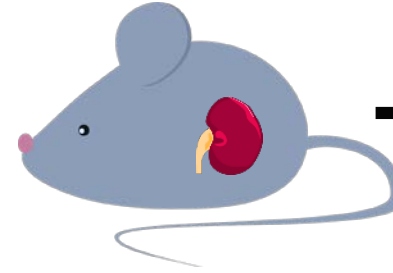


KO CD4⁺ T cells



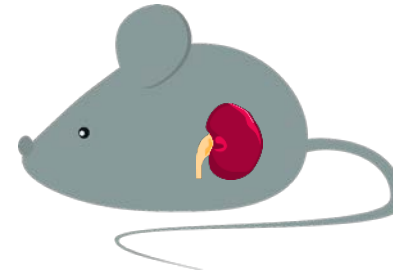
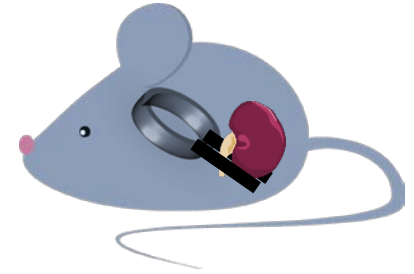
PBS

Recipient



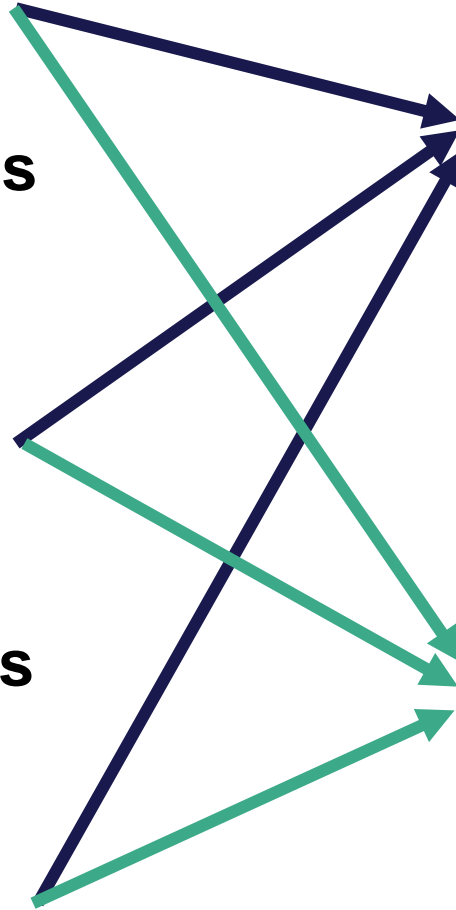
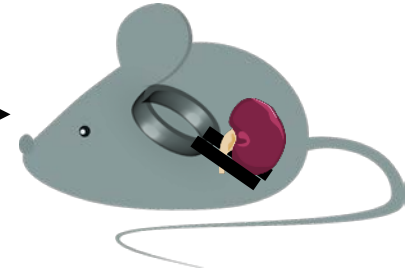
CD4 KO

24hr

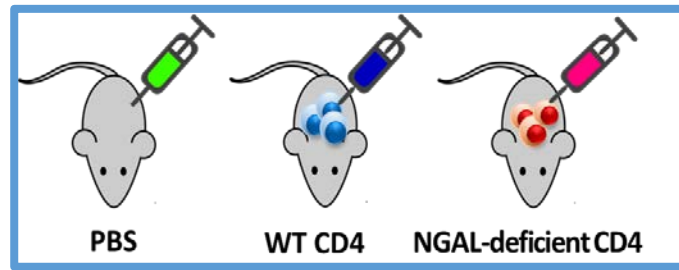


WT

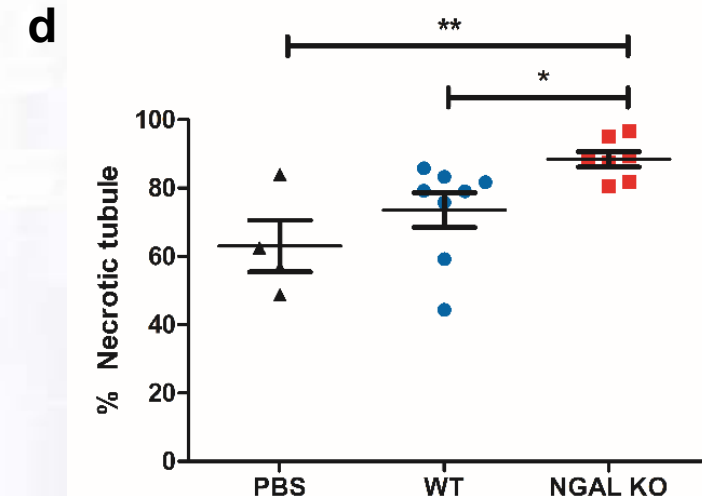
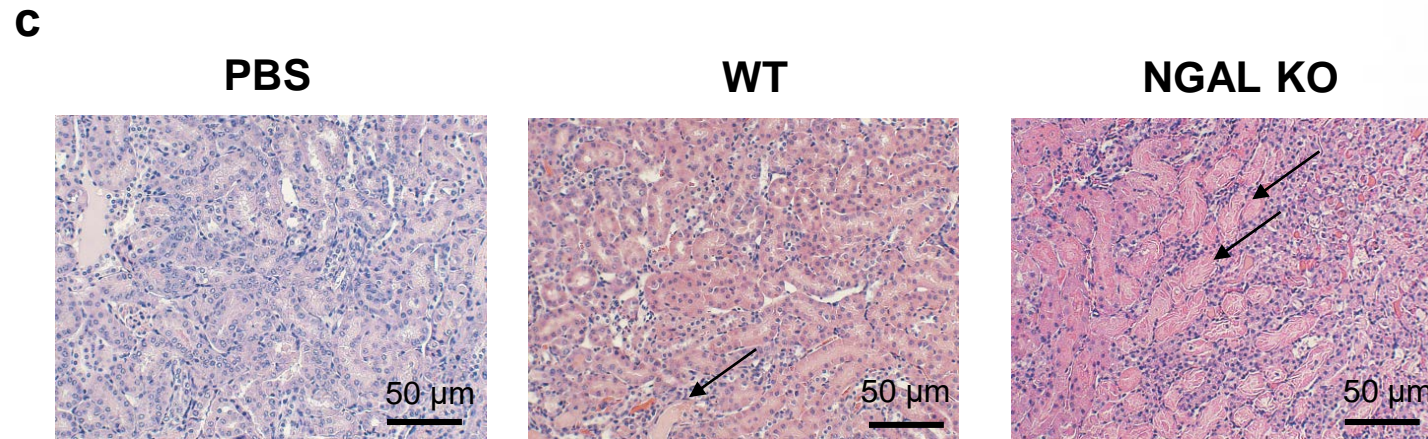
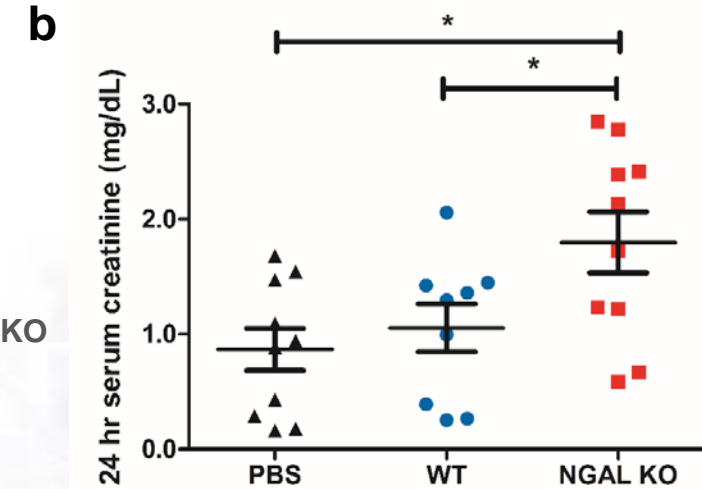
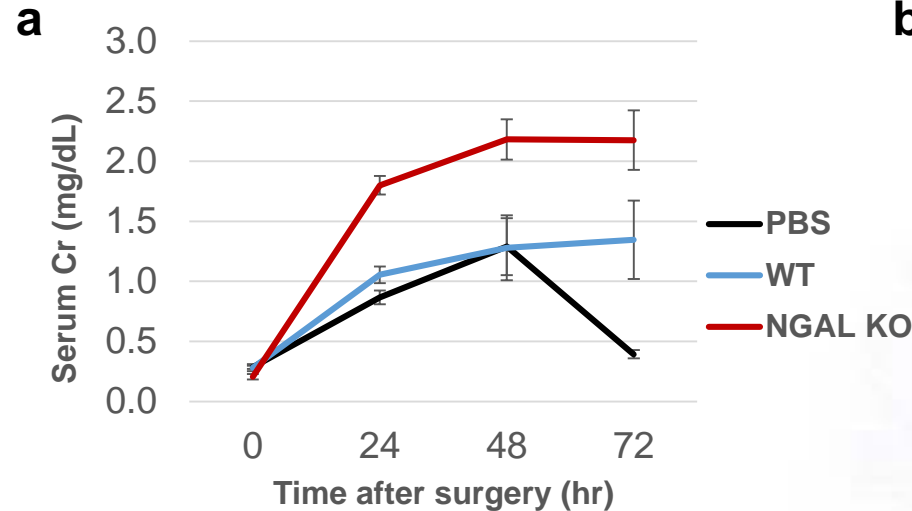
24hr



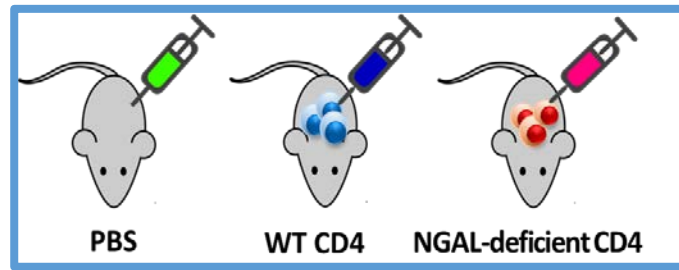
Adoptive transfer of *Lcn2*-deficient CD4⁺ T cells aggravates ischemic AKI



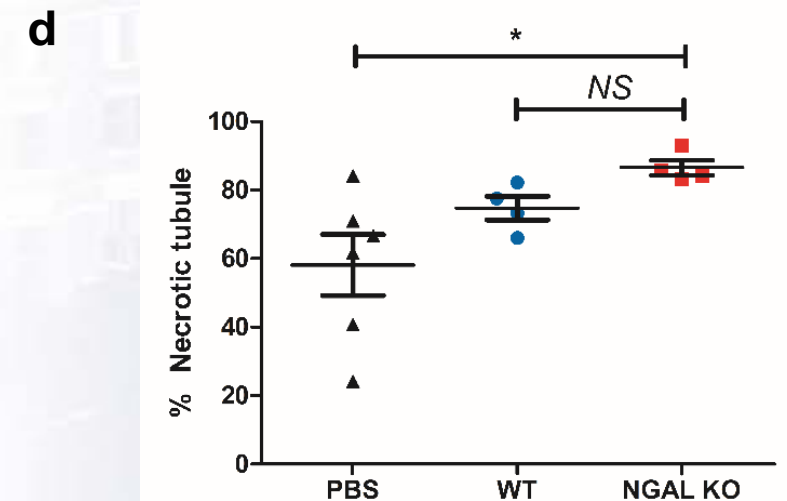
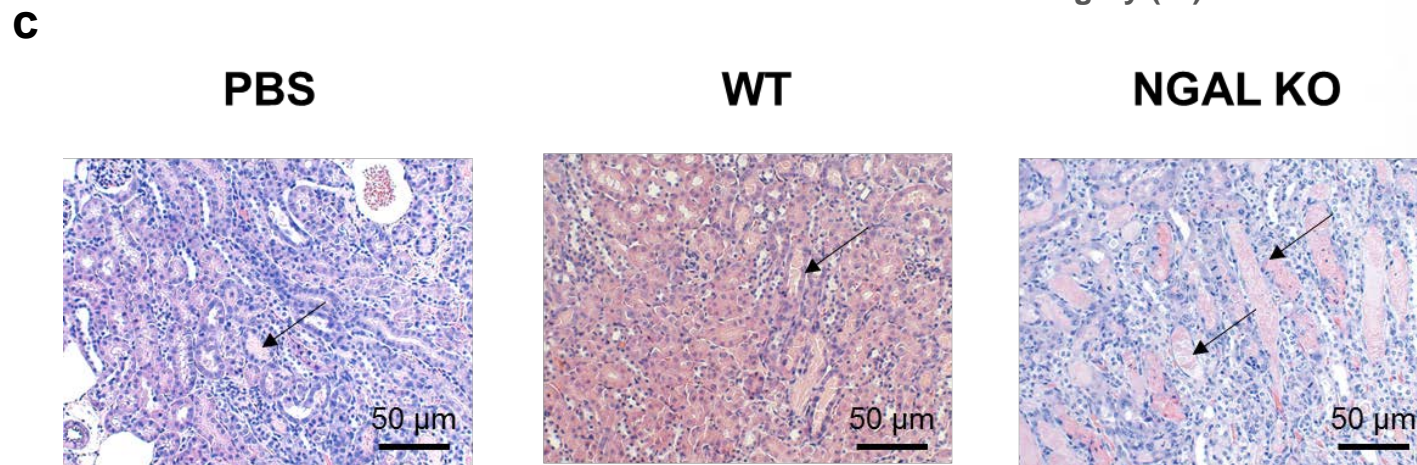
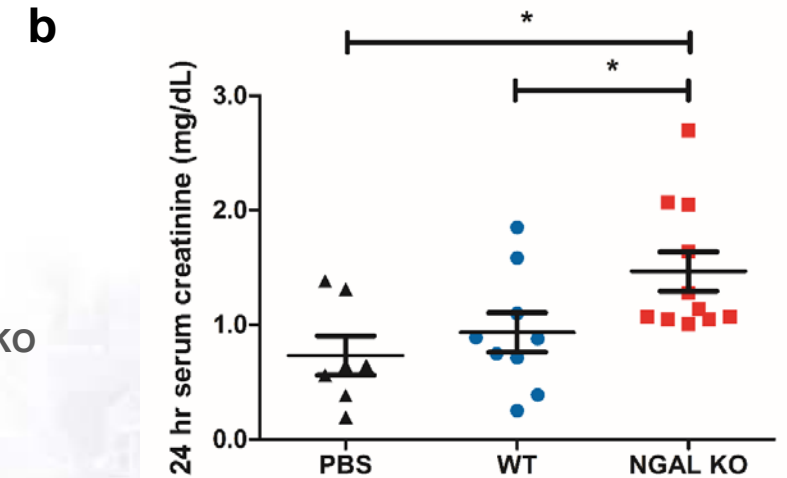
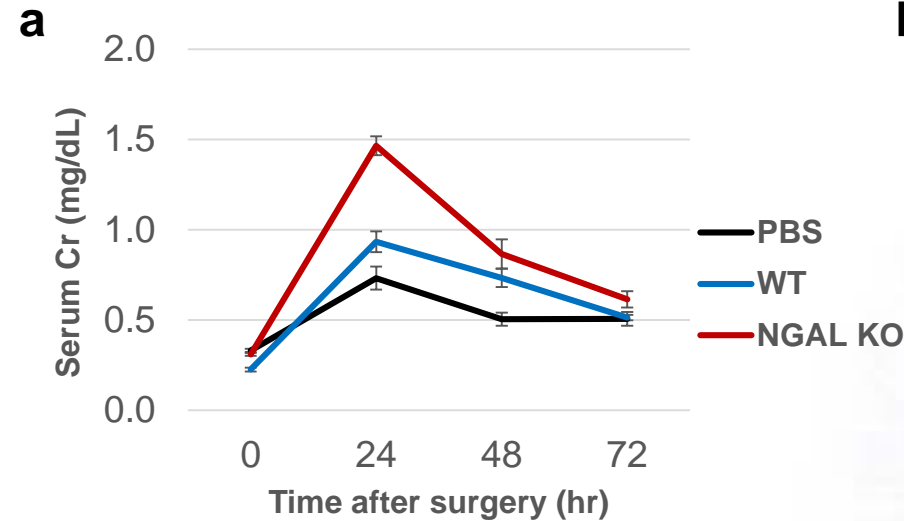
Recipient: CD4 KO



Adoptive transfer of *Lcn2*-deficient CD4⁺ T cells aggravates ischemic AKI



Recipient: WT



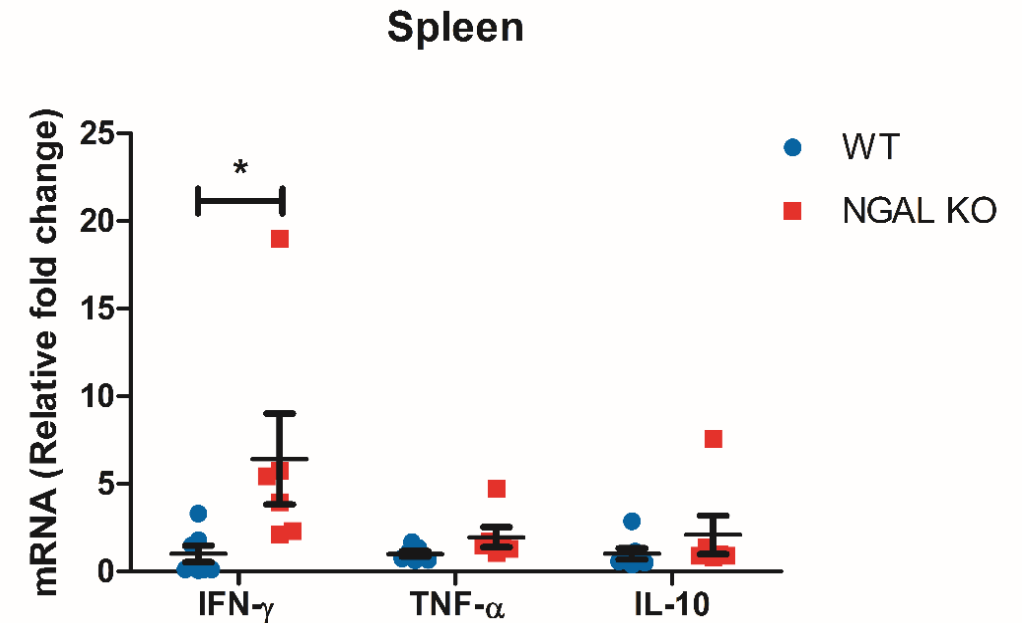
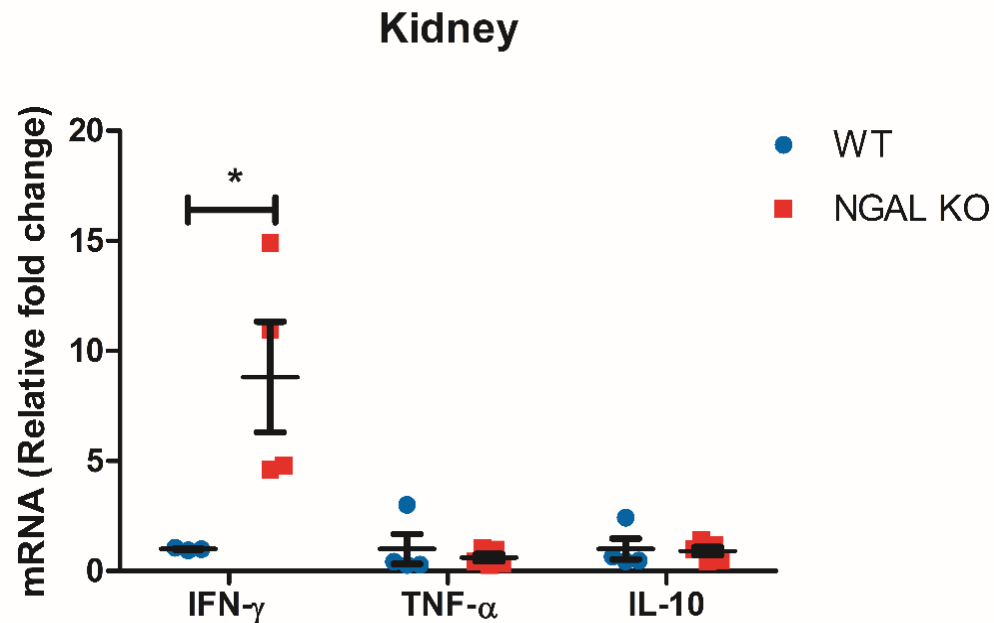
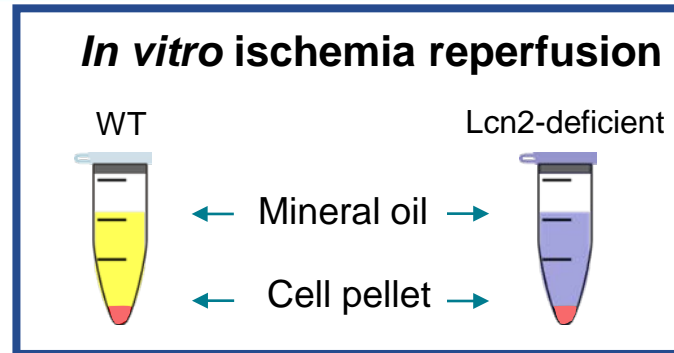
Q1. How do CD4 T lymphocytes mediate the course of ischemic AKI

Q2. Does CD4 T cell NGAL serve any role in the course of ischemic AKI

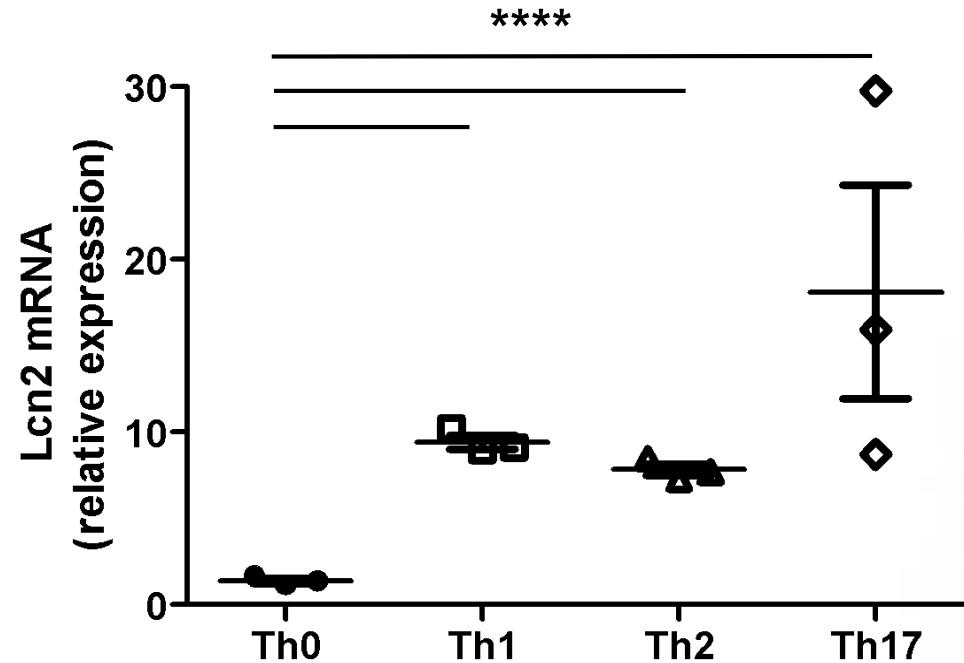
Q3. How does CD4 T cell NGAL protects mice from ischemic AKI



In vitro ischemia reperfusion induces higher *IFN- γ* in *Lcn2*-deficient CD4⁺ T cells



In vitro CD4⁺ T cell differentiation shows increased *Lcn2* expression in Th1, Th2, and Th17 cells



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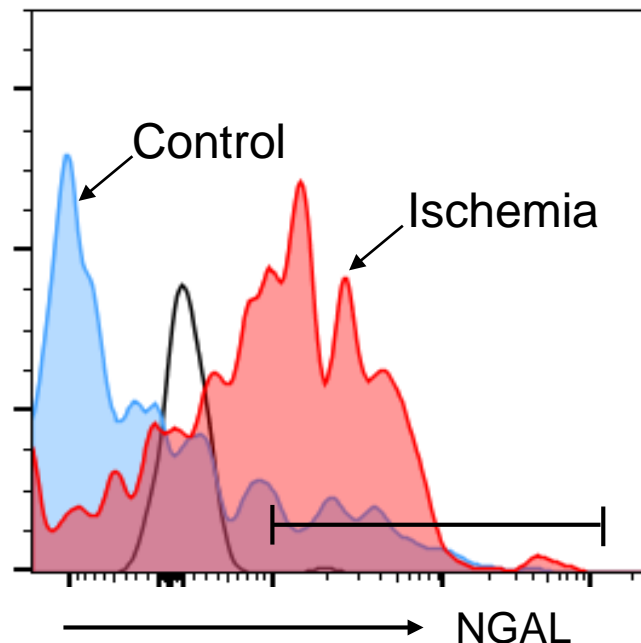
Q3. How does CD4 T cell NGAL protects mice from ischemic AKI



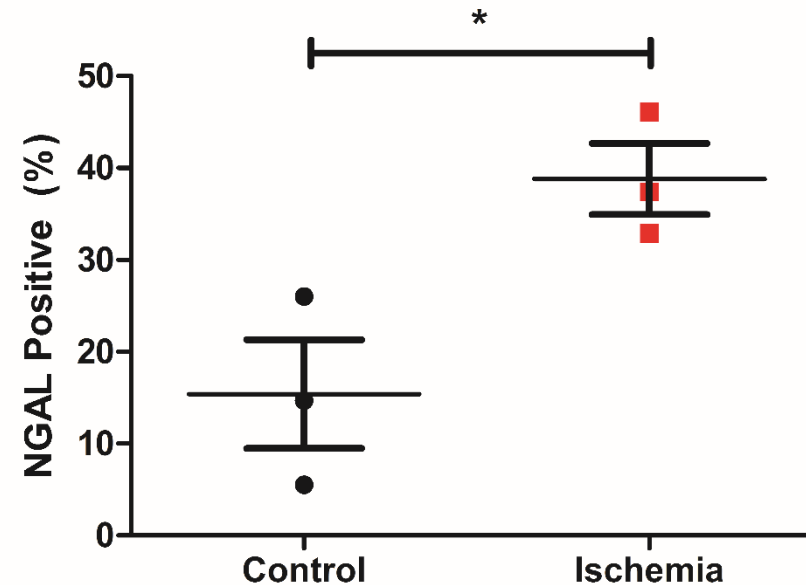
Q4. Is this finding reproducible in HUMAN kidney as well

Human kidney CD4⁺ T cells increase expression of NGAL after ischemic injury

a

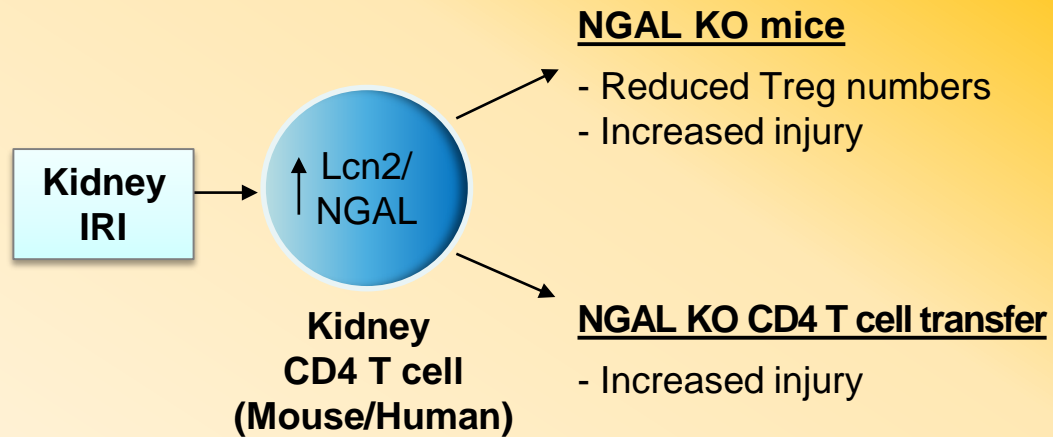


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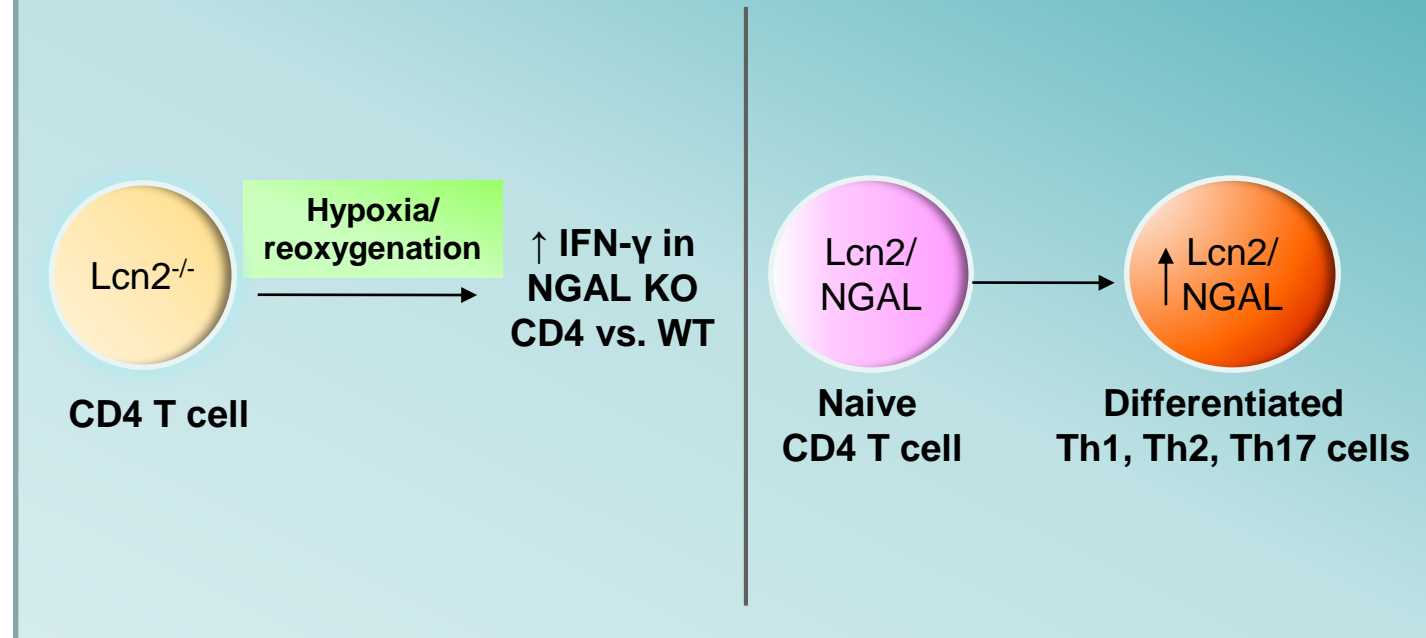


Summary

In vivo



In vitro



Conclusions

- CD4⁺ T cell-derived NGAL is an important underlying mechanism by which immune cells mediate AKI.
- Our study extends the importance of NGAL in AKI beyond diagnostics.
- Further exploration needs to be followed to find out the biological role of CD4⁺ T cell-derived NGAL in renal injury.

