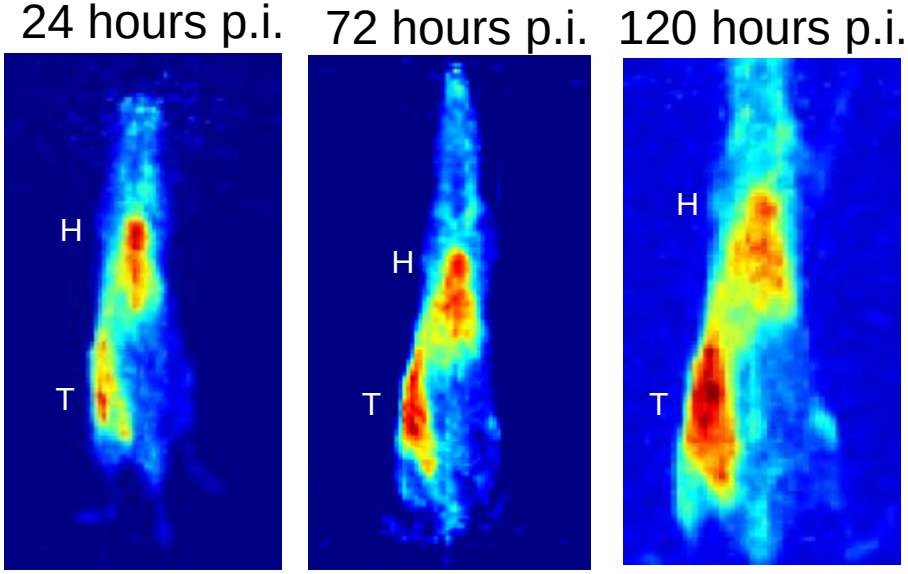
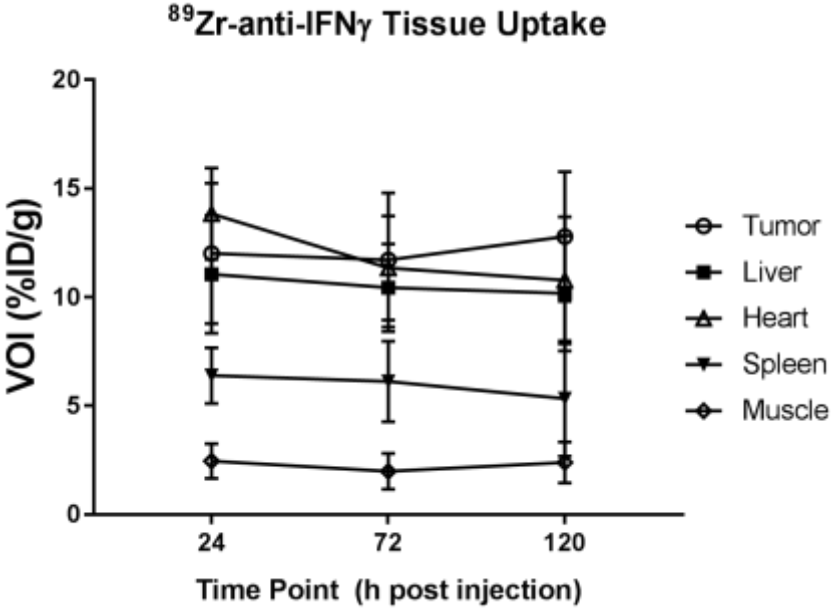
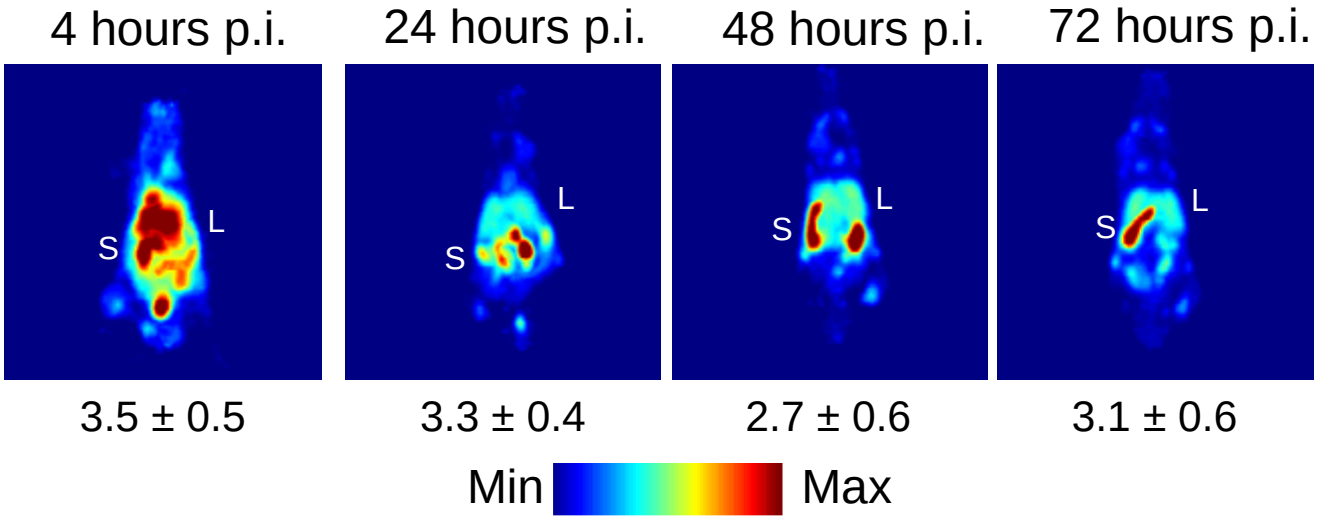


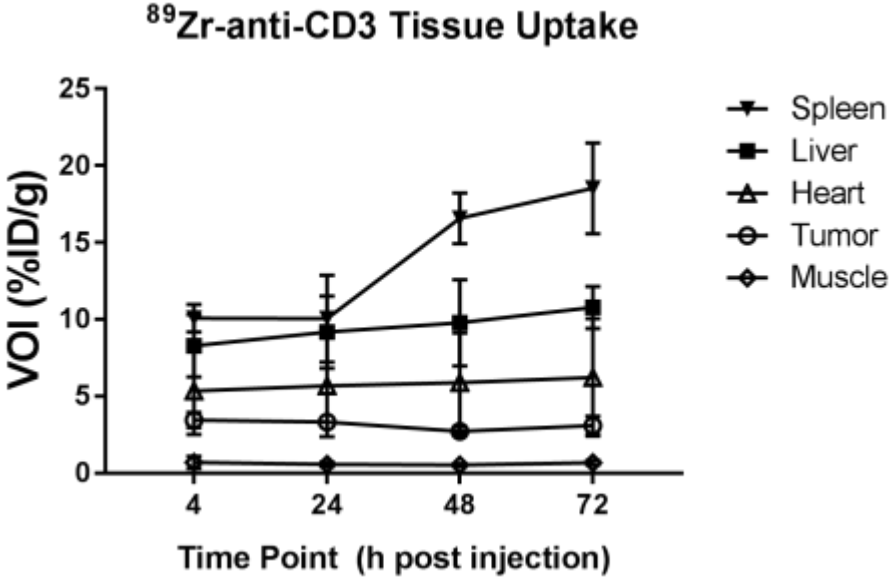

**Tumor VOI %ID/g:** 12.0 ± 3.2 11.7 ± 3.1 12.7 ± 3.0

Min Max

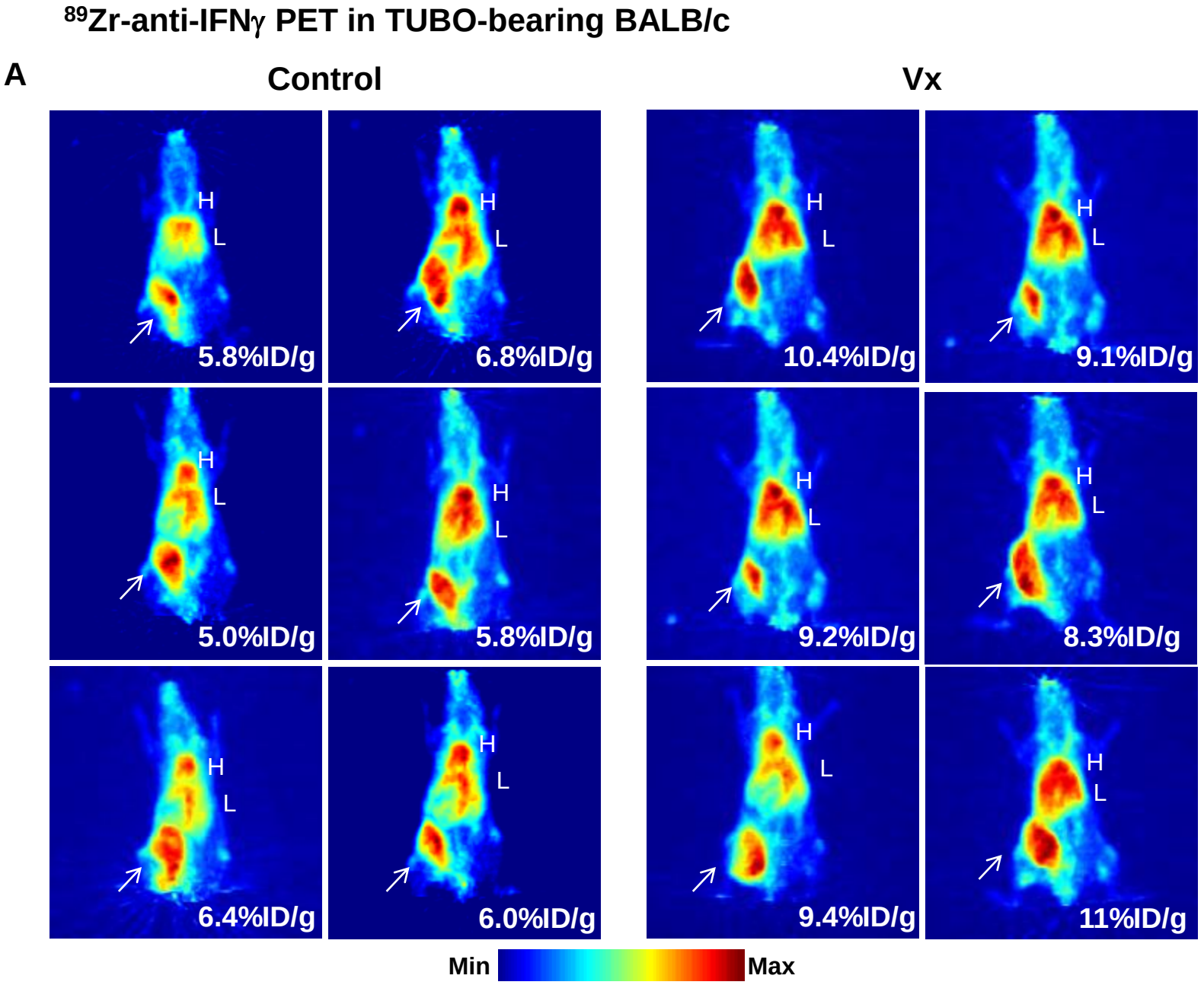


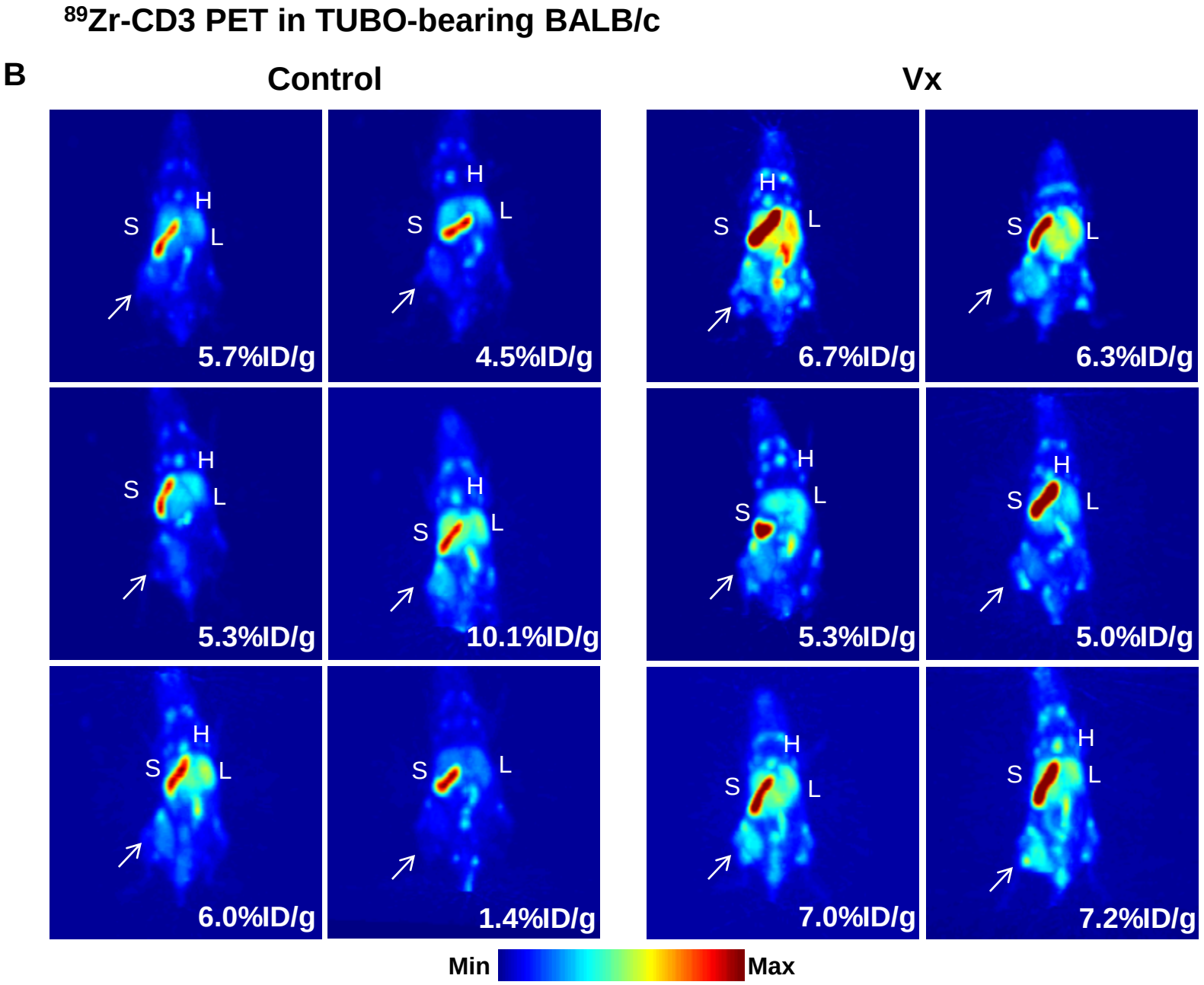

**Supplementary Figure 1. Time course imaging of $^{89}$Zr-anti-IFNγ.** Mice were injected with $^{89}$Zr-anti-IFNγ and images of MIP are shown for each time point (top). L = liver, S = spleen. A plot of the volumes-of-interest obtained from select tissues is shown over time from 24-120 h p.i.



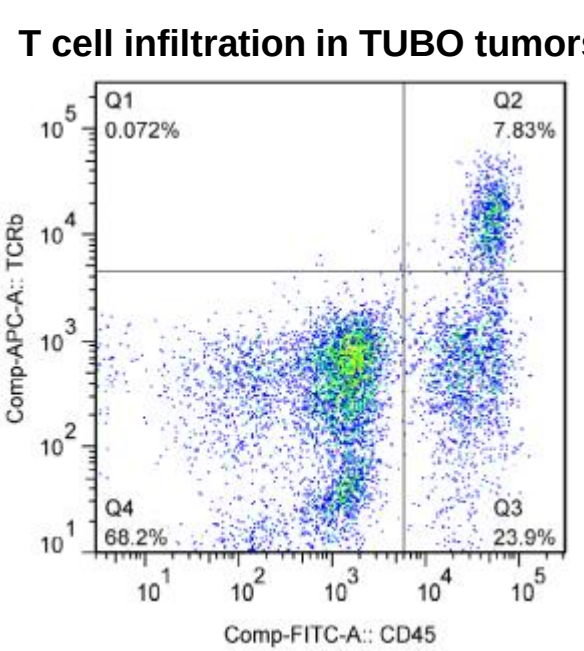

**Supplementary Figure 2. Time course imaging of $^{89}$Zr-anti-CD3.** Mice were injected with $^{89}$Zr-anti-CD3 and images of MIP are shown for each time point (top). L = liver, S = spleen. A plot of the volumes-of-interest obtained from select tissues is shown over time from 4-72 h p.i.


89Zr-anti-IFNγ PET in TUBO-bearing BALB/c
A
Control
Vx
H
L
5.8%ID/g
6.8%ID/g
10.4%ID/g
9.1%ID/g
5.0%ID/g
5.8%ID/g
9.2%ID/g
8.3%ID/g
6.4%ID/g
6.0%ID/g
9.4%ID/g
11%ID/g
Min
Max

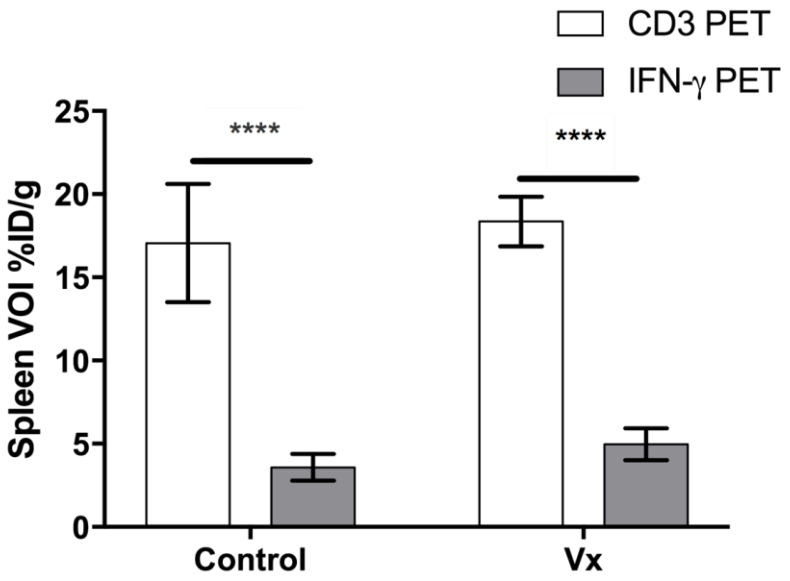



**Supp. Fig 3**. MIP images of (A) $^{89}$Zr-anti-IFNγ and (B) $^{89}$Zr-anti-CD3 detection in all control (left) and vaccinated (right) TUBO bearing mice.

A

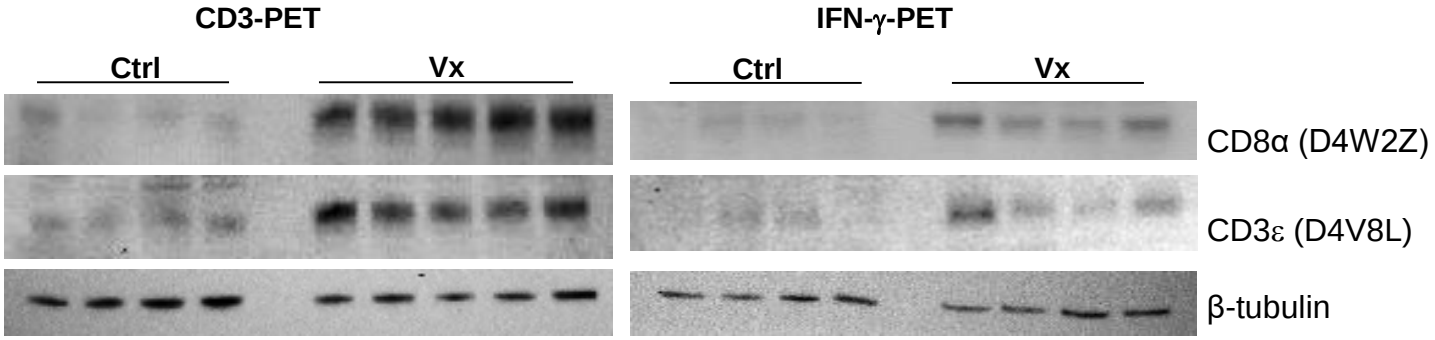



B




**Supplementary Figure 4. T cell detection in TUBO-bearing BALB/c.** A) Tumors from untreated TUBO-bearing mice were dissociated and stained with CD45, to detect total leukocyte infiltrates, and the T cell receptor beta chain (TCRβ), to identify the T cell fraction, by flow cytometry. B) Spleen VOIs were calculated for each TUBO-bearing mouse imaged with either $^{89}$Zr-anti-IFNγ or . $^{89}$Zr-anti-CD3.

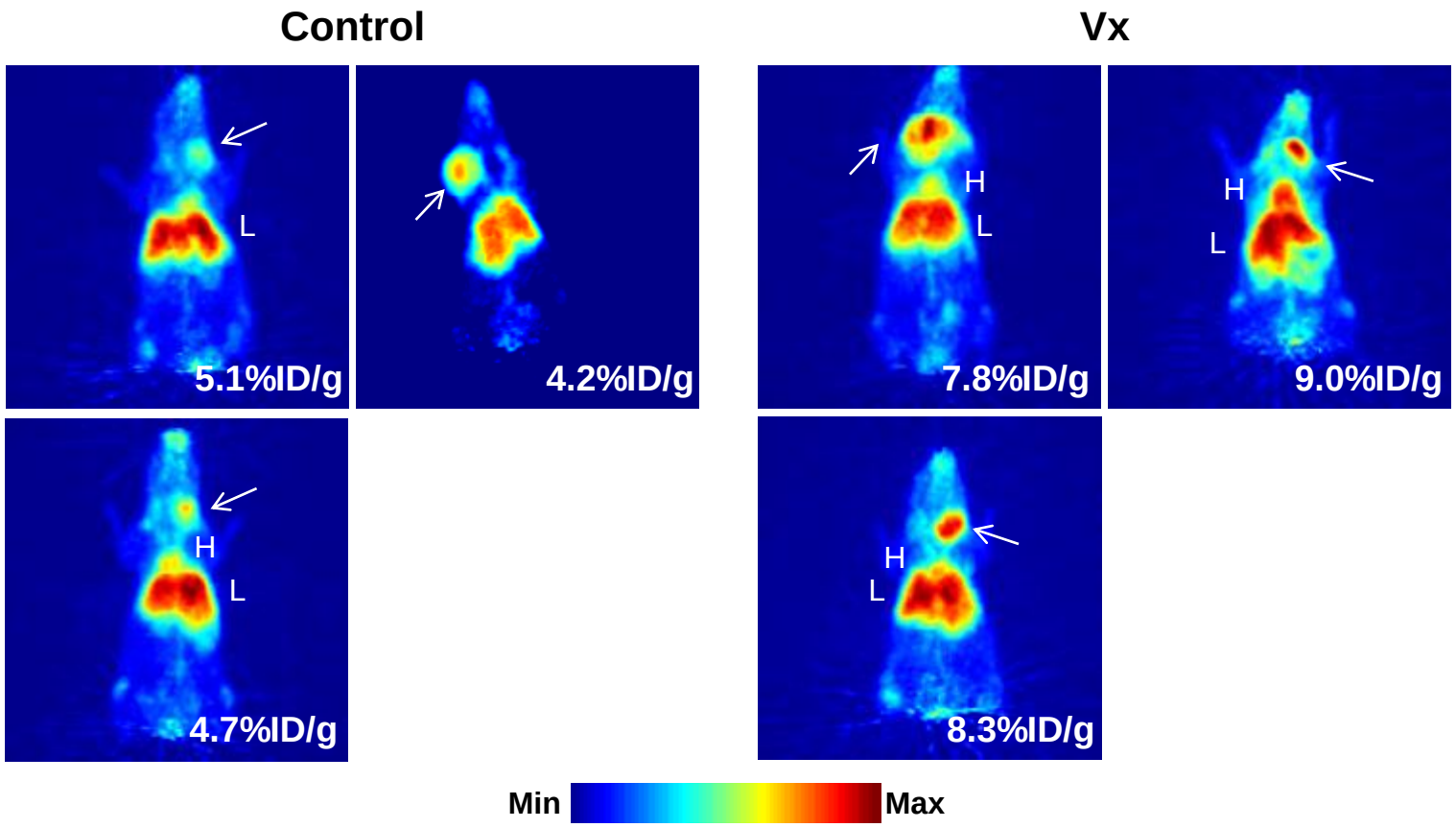
**C**

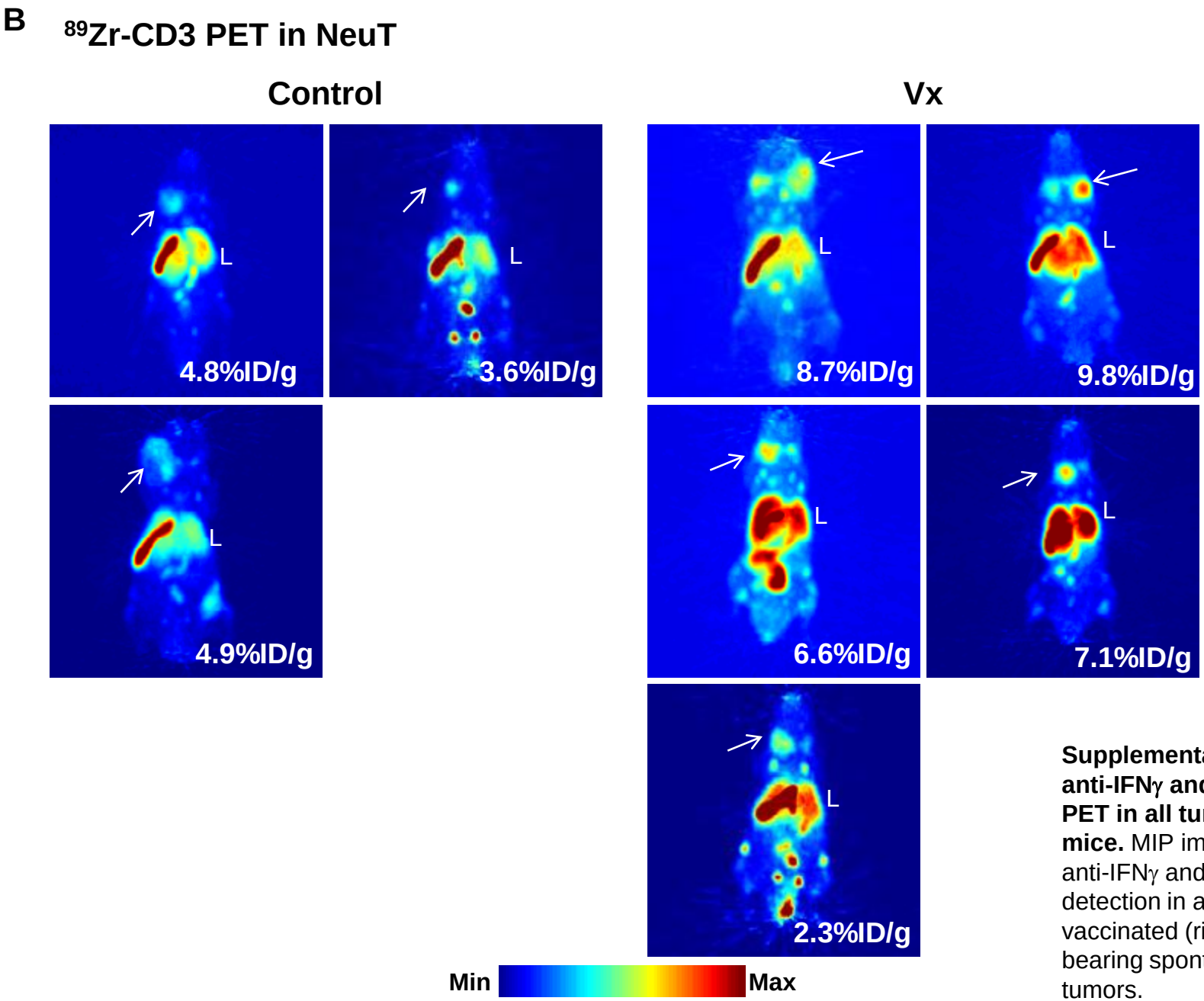



**Supplementary Figure 5. Immunoblot detection of T cell markers in imaged TUBO-bearing mice.** Western blots from lysed decayed tumor tissues post-CD3 or IFN-γ PET were conducted to analyze presence of CD3 and CD8 protein in the Vx vs Ctrl mice.

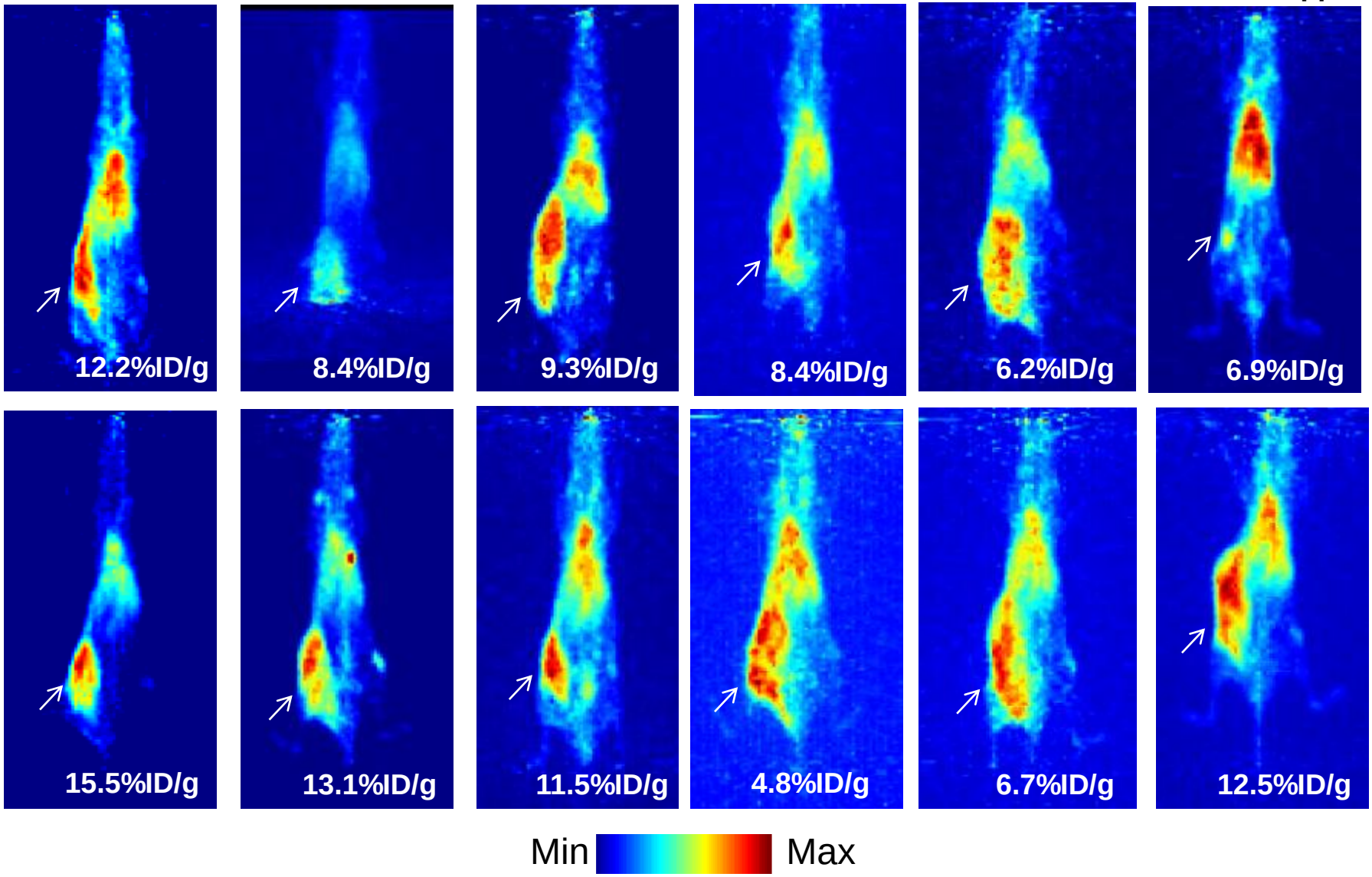
A

$^{89}$Zr-IFNγ PET in NeuT

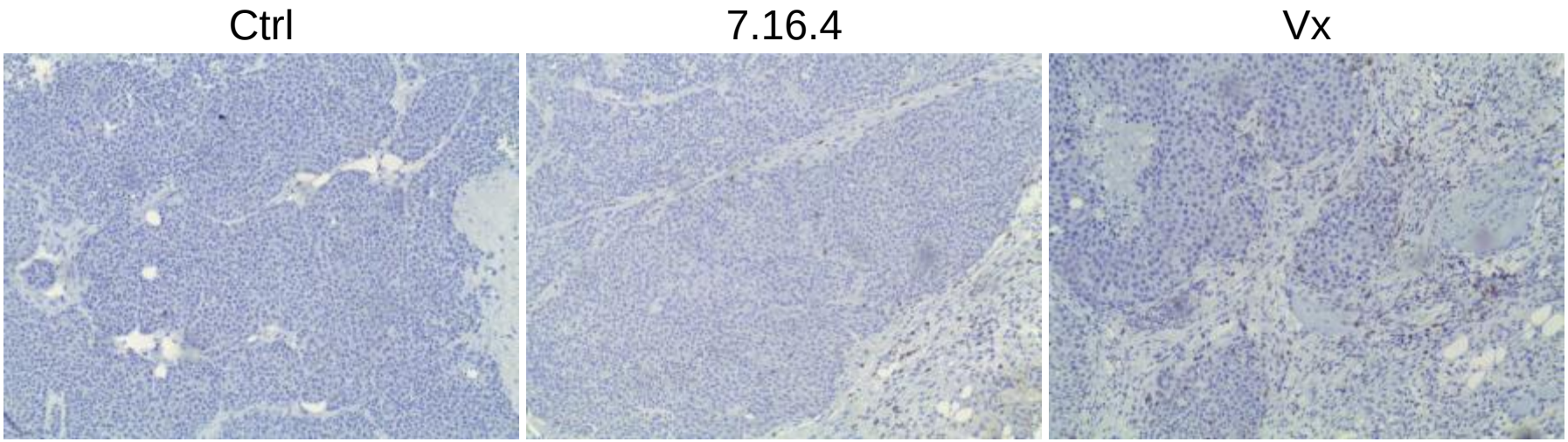





**Supplementary Figure 6. $^{89}$Zr-anti-IFNγ and $^{89}$Zr-anti-CD3 PET in all tumor-bearing NeuT mice.** MIP images of (A) $^{89}$Zr-anti-IFNγ and (B) $^{89}$Zr-anti-CD3 detection in all control (left) and vaccinated (right) NeuT mice bearing spontaneous salivary tumors.




**Supplementary Figure 7. $^{89}$Zr-IFN-γ PET of vaccinated mice for correlation to tumor growth.** MIP images of $^{89}$Zr-anti-IFNγ detection in all vaccinated TUBO mice bearing tumors.




**Supplementary Figure 8. CD8 IHC after ITx.** Intratumoral localization of CD8 was analyzed by IHC on FFPE tissue (100×)