



THE UNIVERSITY of
MISSISSIPPI
CHEMISTRY



Ionic Liquid Coating-Driven Nanoparticle Delivery to the Brain: Applications for Neuro-HIV

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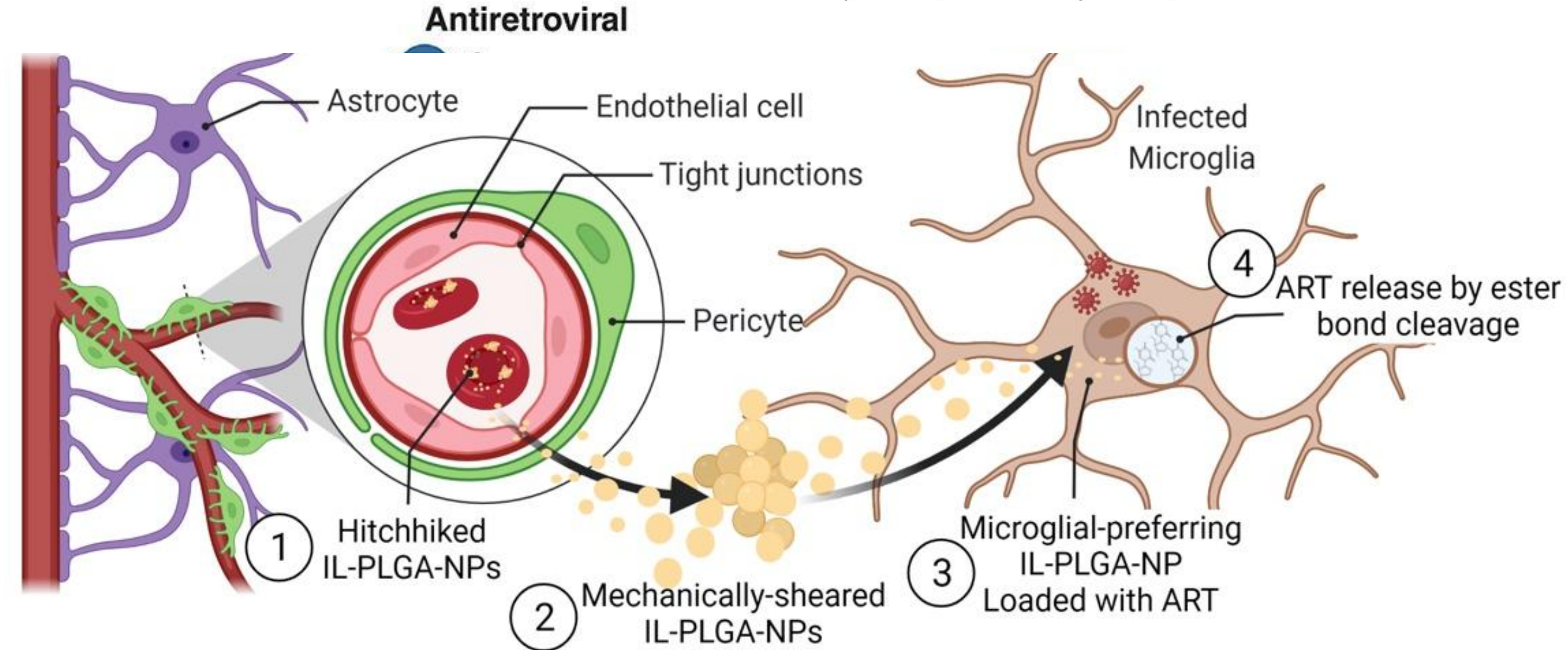
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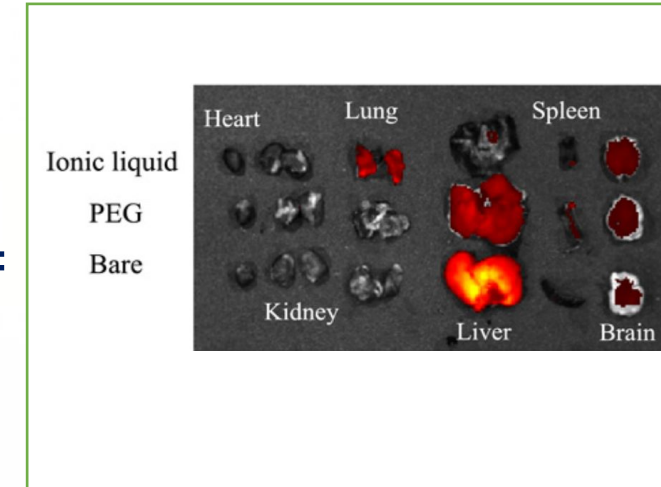
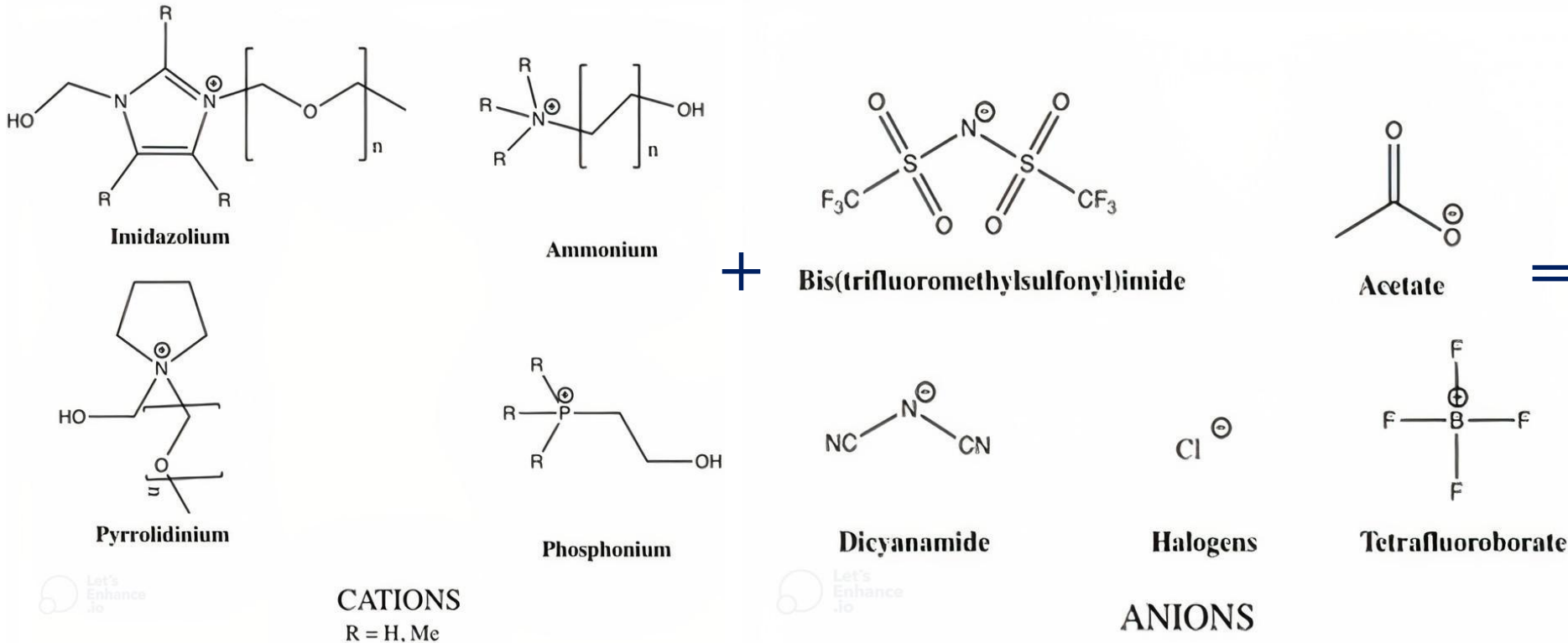
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THE FUTURE OF DELIVERY SCIENCE

HIV “Hitchhikes” Immune Cells Across the BBB and Infiltrates the CNS



Ionic Liquids (IL) Can Overcome NP Barriers in the Bloodstream

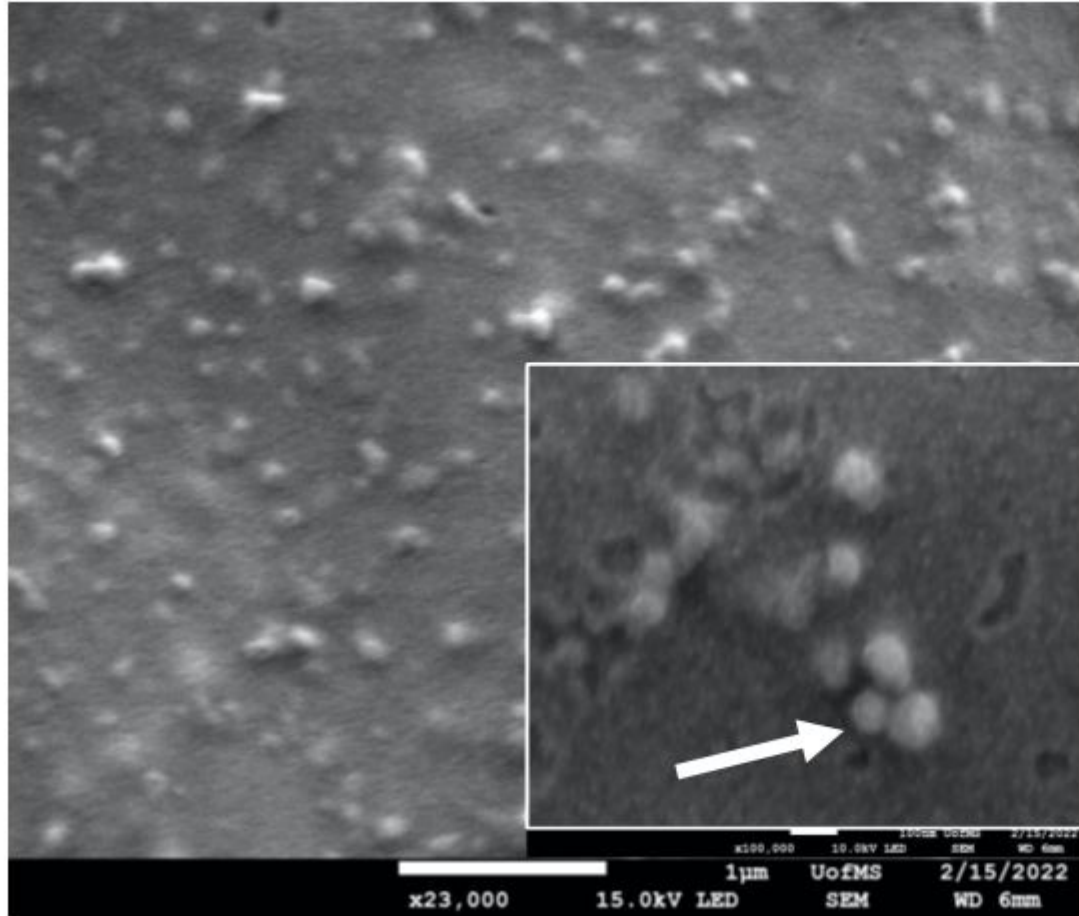


choline trans-2-hexenoic acid
[CA2HA 1:2]

Can We Target Neuro-HIV in the Brain Via RBC Hitchhiking?

IL-PLGA NP Synthesis and Characterization

C

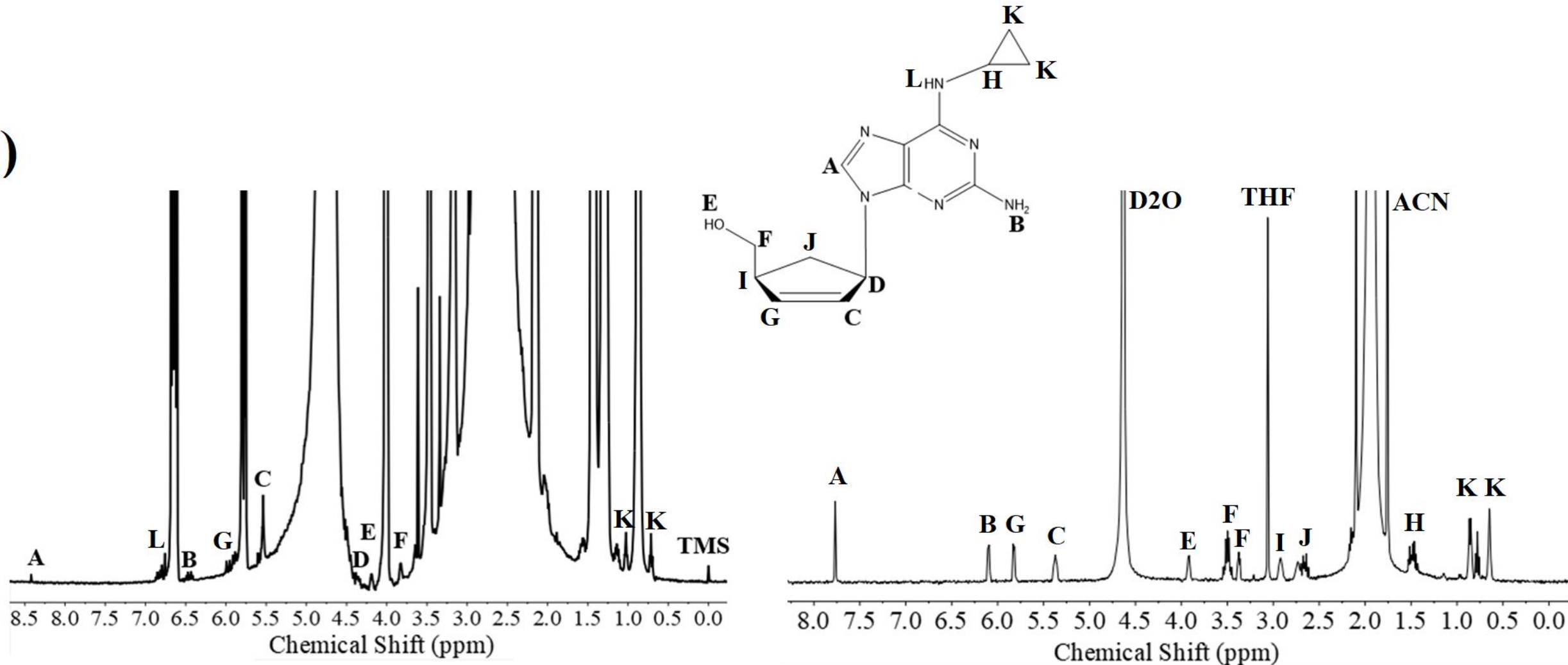


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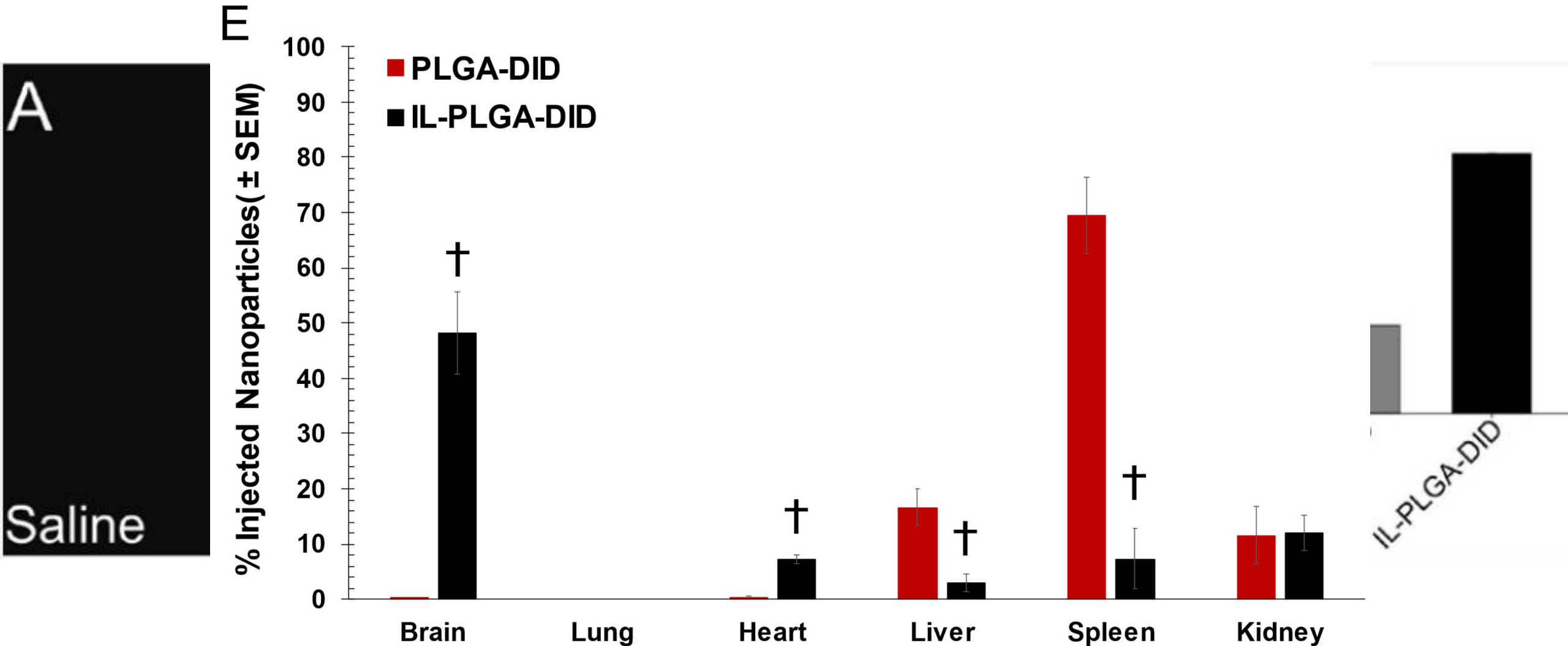


IL-PLGA NP Encapsulation of Abacavir

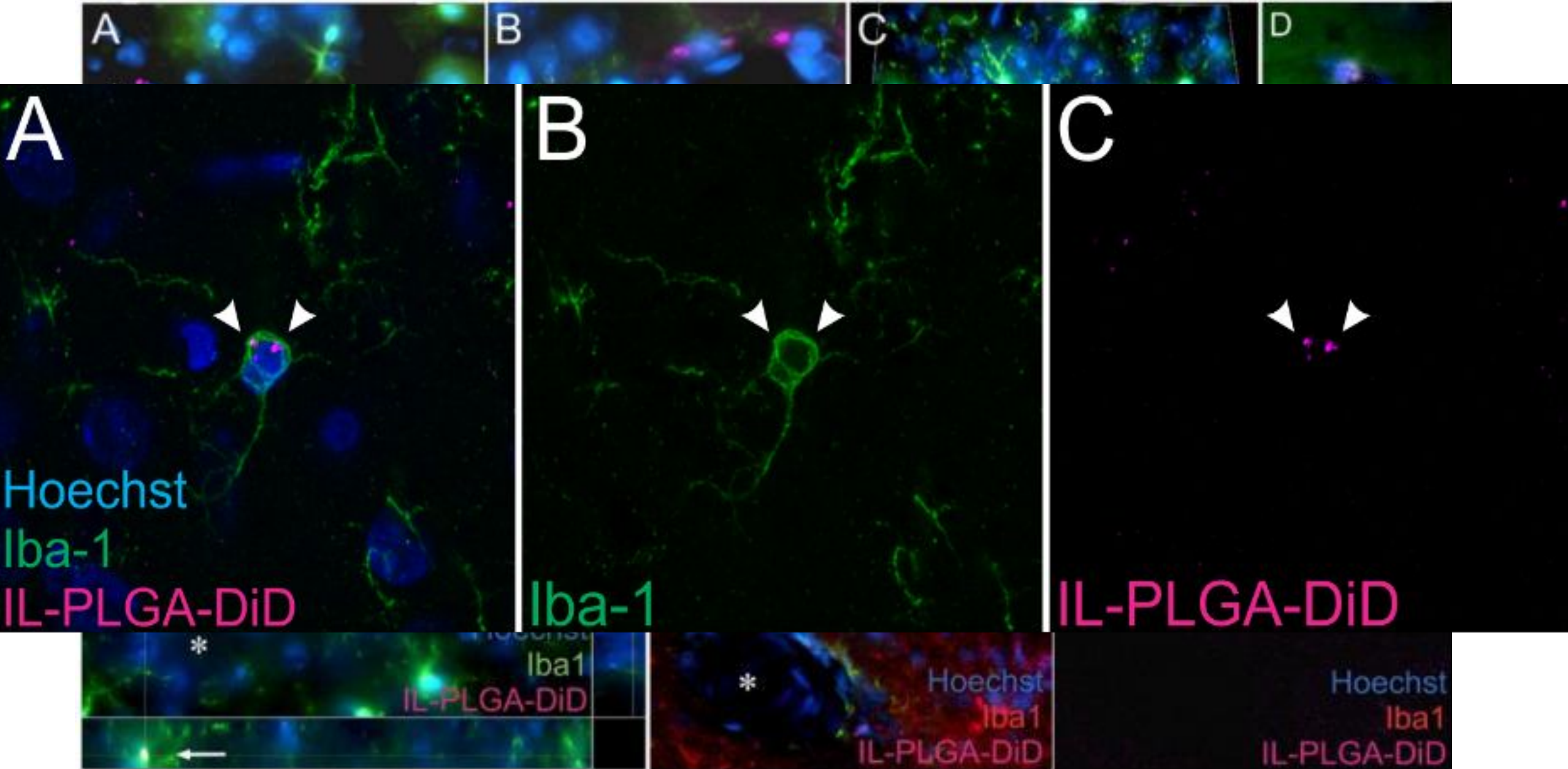
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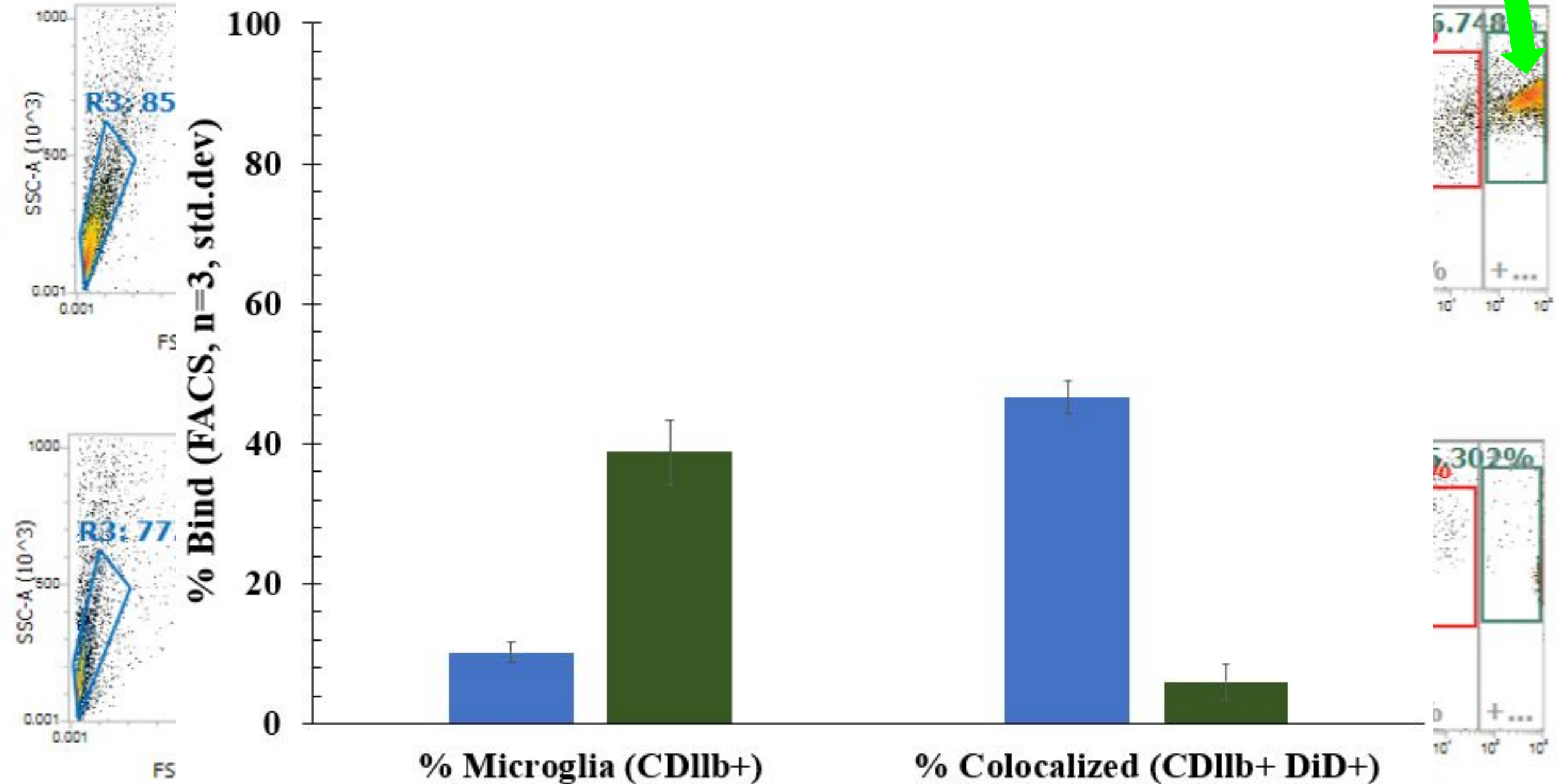
CA2HA 1:2 IL Drives PLGA NP delivery to the Brain

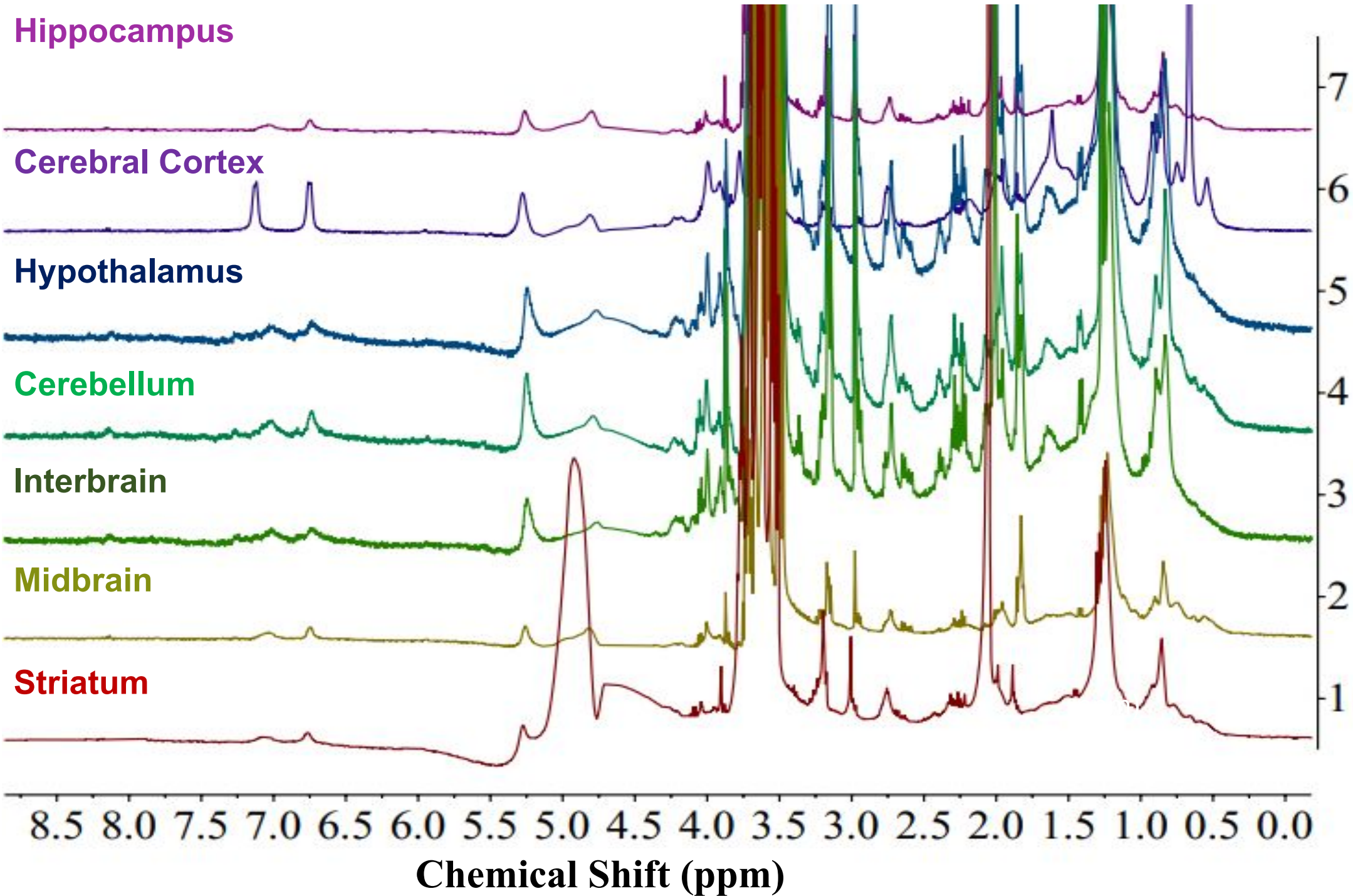


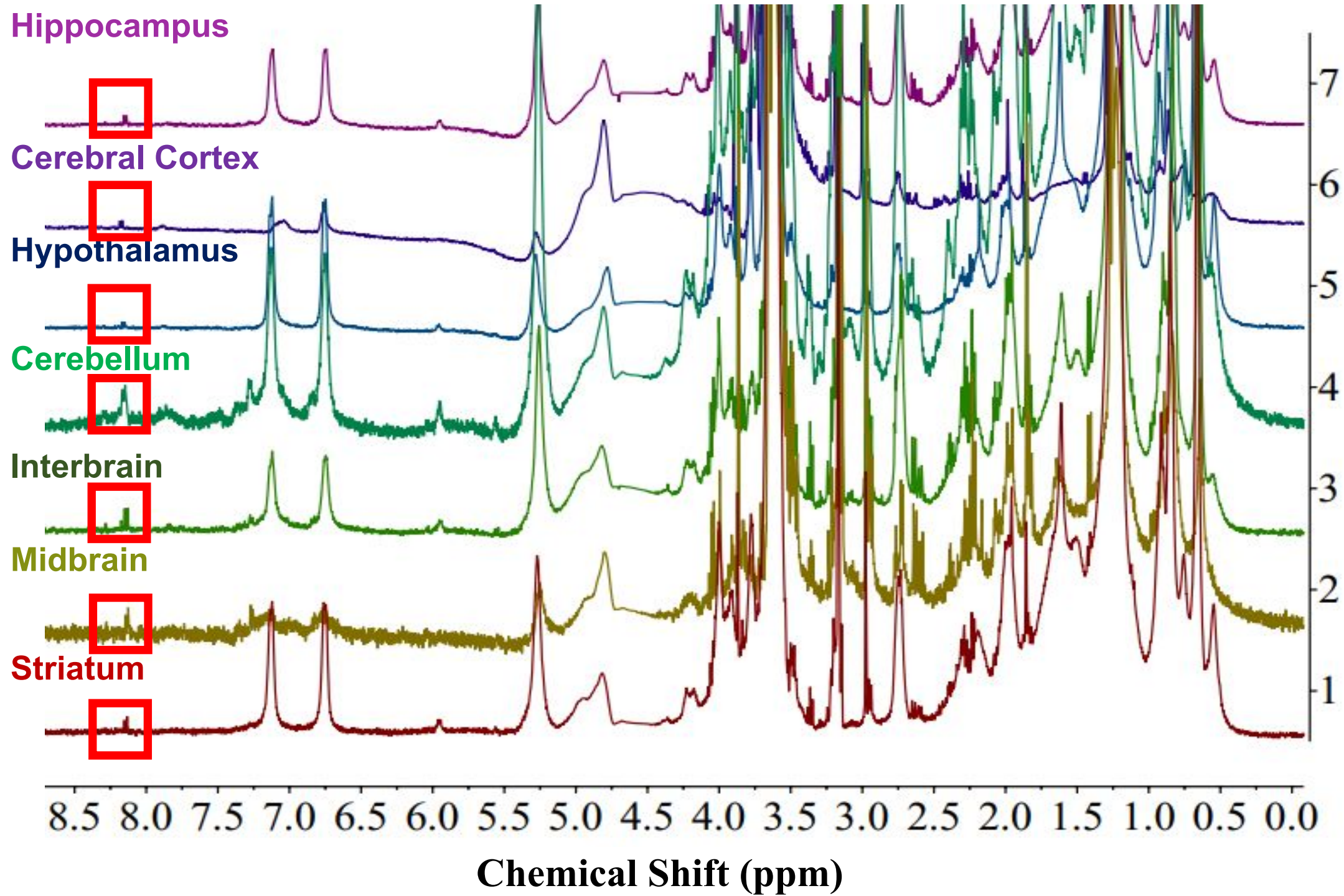
IL-NPs Localize in Microglia Post-Entry from Blood Vessels



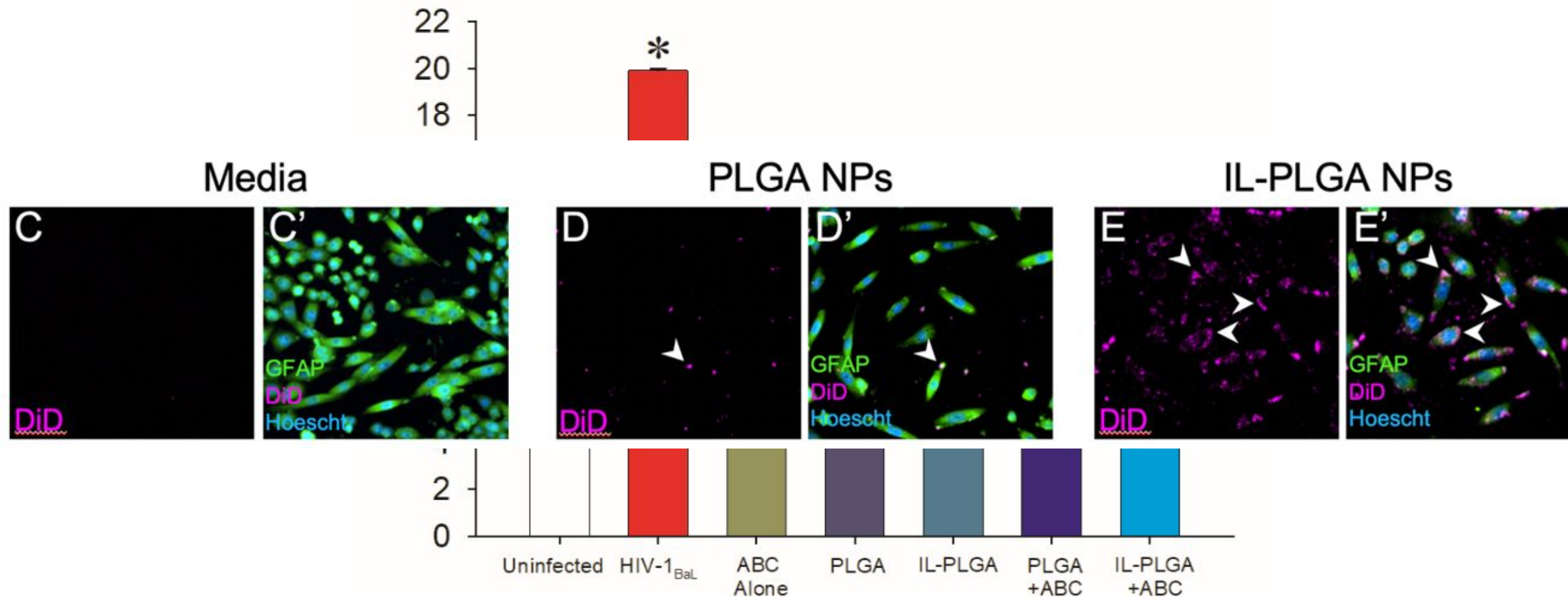
IL-NPs Localize in Microglia Post-Entry from Blood Vessels







Biocompatible IL-NPs Enhance Neural Cell Uptake & Silence Viral Expression



Conclusions

Choline Trans-2-Hexenoate IL:

- 1) Changes biodistribution of PLGA NPs depending on IV injection site
- 2) Delivers unprecedented doses of NPs through the BBB via RBC hitchhiking
- 3) Colocalizes with different Microglia populations deep in the brain, a major HIV reservoir

Key Takeaway:

By controlling the physical chemistry of blood cell-IL interactions, we can bypass **biological tissue barriers** drive for unprecedented intravenous drug delivery

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