35 Nanoparticle size influences antigen retention and presentation in lymph node follicles for humoral immunity

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Introduction

- Efficient vaccination relies on long-lived humoral immune function
  - ➢ germinal center reactions
  - ➢ antibody production
- Antigens conjugated to synthetic nanoparticles are designed for codelivery into lymph node follicles to elicit greater humoral immune responses than antigens alone.

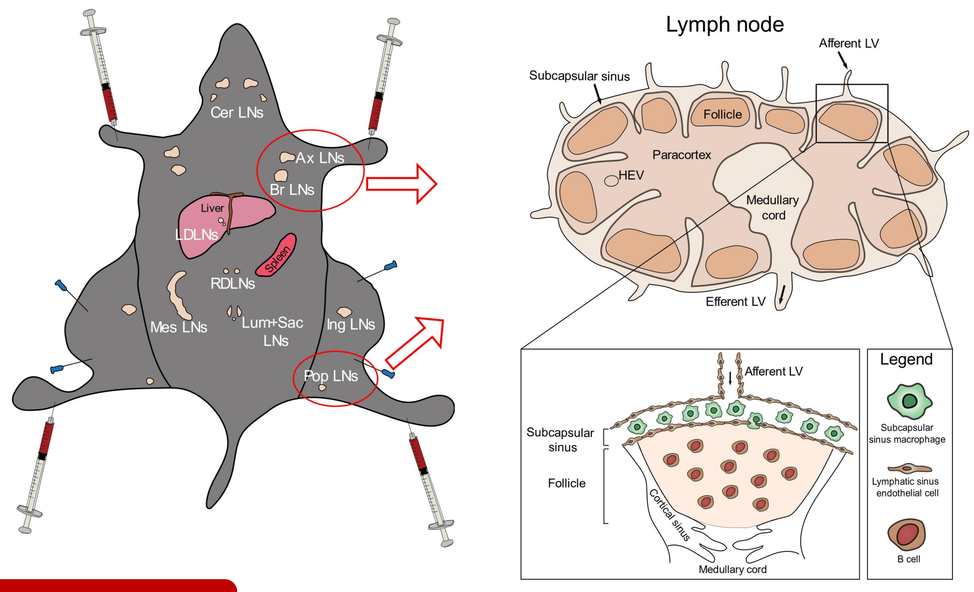
Research question:

we do not know how lymph nodes process nanoparticles for efficient humoral immunity?

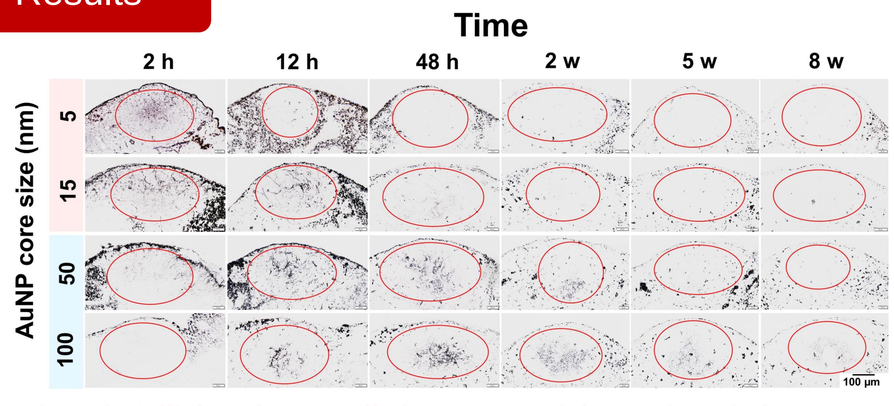
Objective:

To uncover how different designs (sizes) of nanoparticles interact with cells inside the follicle that influences (1) follicular retention, (2) antigen presentation, and subsequently generates (3) germinal center reaction and (3) antigen-specific antibody production.

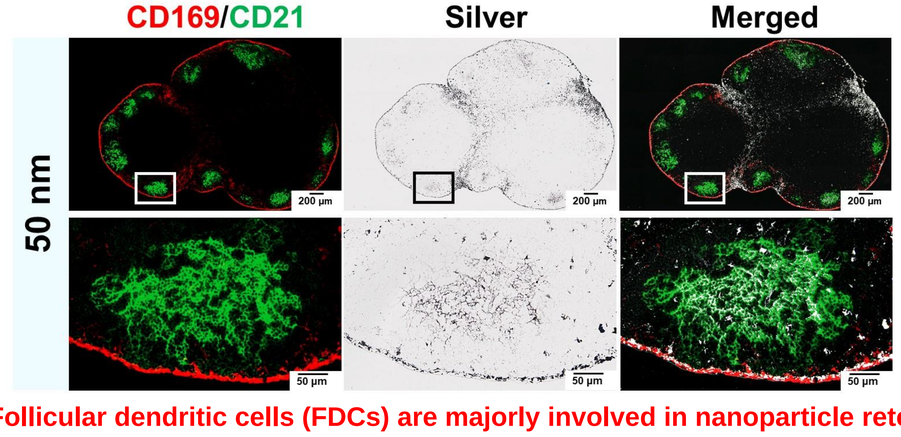
Methods



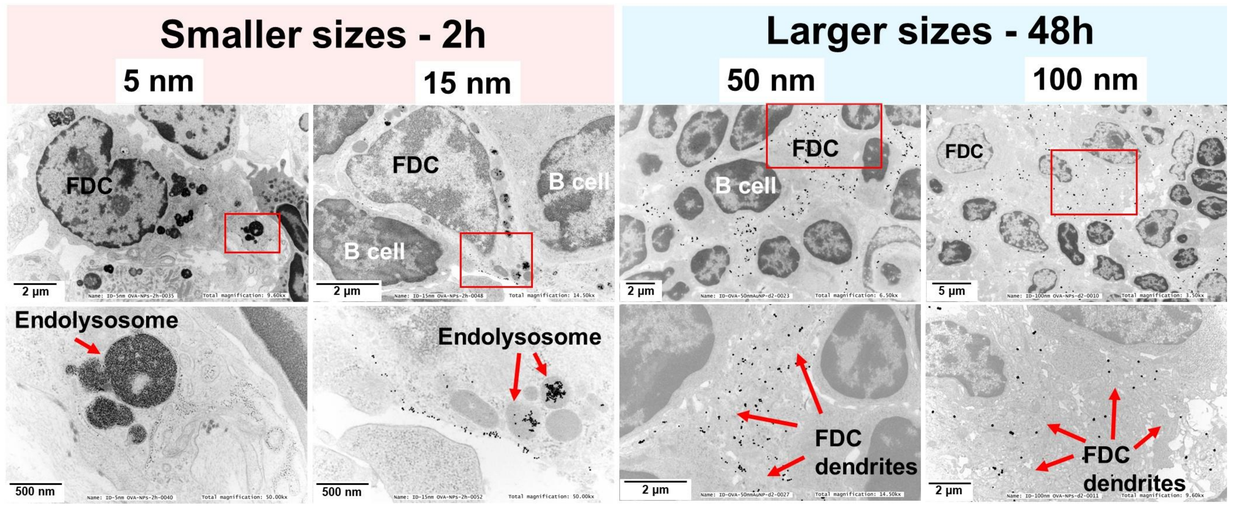
Results



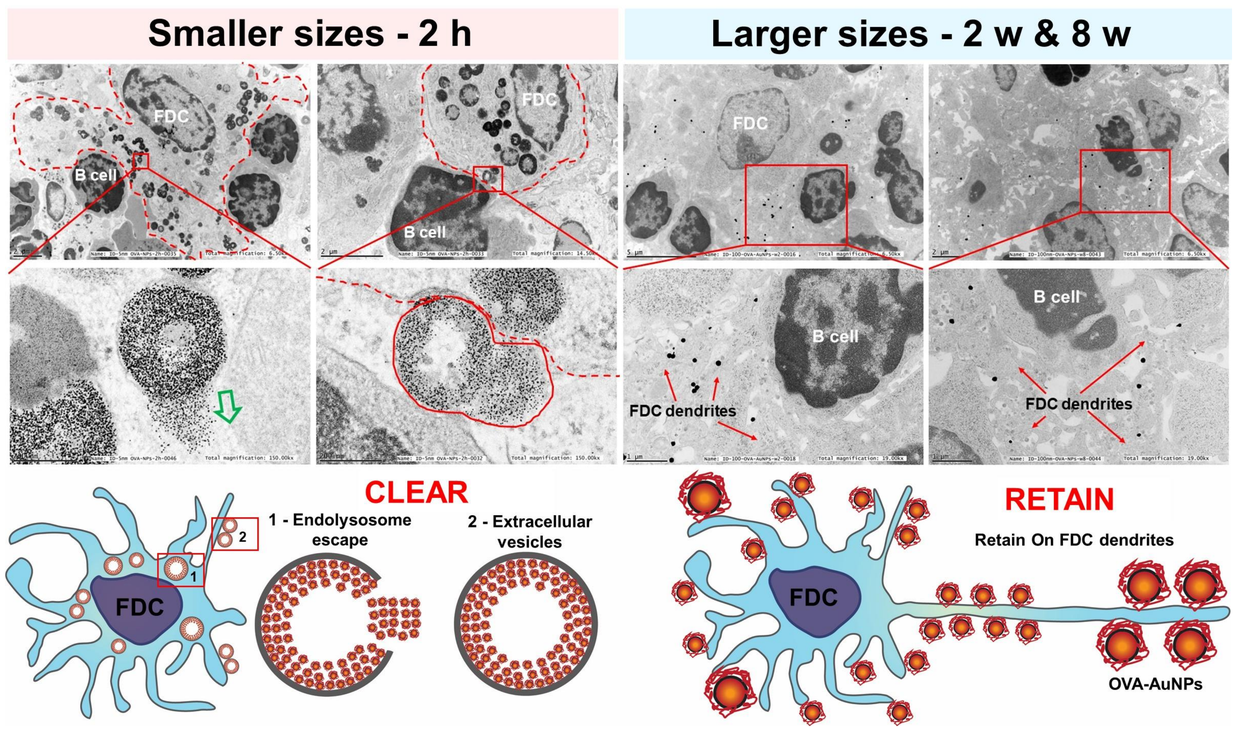
Lymph node follicles clear small size nanoparticles and retain larger ones

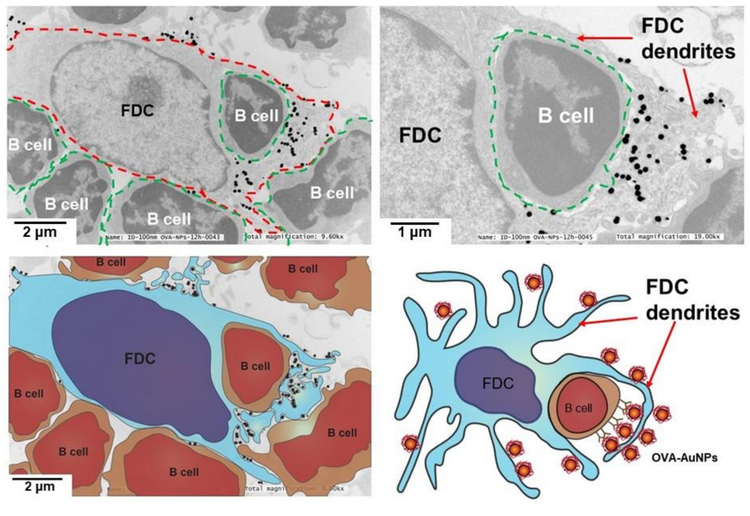


Follicular dendritic cells (FDCs) are majorly involved in nanoparticle retention

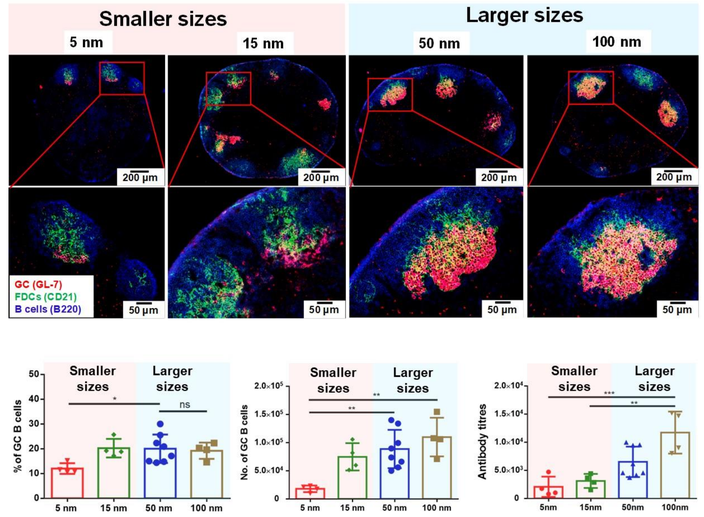


FDCs internalize smaller sizes, and align larger sizes on their surfaces or dendrites





FDCs present nanoparticle conjugated antigen on their dendrites and stimulate B cells



50-100 nm sized nanoparticle vaccines induce greater humoral immune responses

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