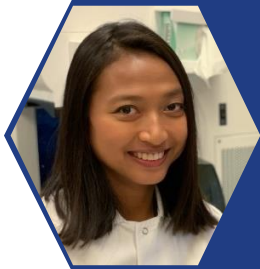


# SigN VIRTUAL SEMINAR

hosted by Dr Florent Ginhoux

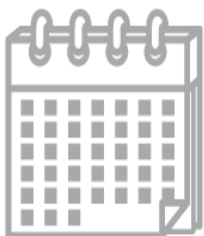


## Dr Faezzah Baharom

Vaccine Research Center, NIAID, NIH, DHHS

### Systemic delivery of a nanoparticle cancer vaccine generates effective antitumor immunity

Personalized cancer vaccines targeting patient-specific neoantigens are a promising cancer treatment modality. However, the physicochemical variability of neoantigen peptides can present challenges to manufacturing personalized cancer vaccines in an optimal format for inducing anticancer T cells. Here, we developed a vaccine platform (SNP-7/8a) based on charge-modified peptide–TLR-7/8a conjugates that are chemically programmed to self-assemble into nanoparticles of uniform size (~20 nm) irrespective of the peptide antigen composition. This approach provided precise loading of diverse peptide neoantigens linked to an adjuvant in nanoparticles, which increased uptake by and activation of dendritic cells. Importantly, linking the antigen and adjuvant also enabled systemic delivery of the vaccine. Single-cell RNA sequencing of neoantigen-specific CD8<sup>+</sup> T cells showed that intravenous vaccination (SNP-IV) induced stem-like genes (Tcf7, Tox, Xcl1) whereas subcutaneous immunization (SNP-SC) enriched for effector genes (Gzmb, Klrg1, Cx3cr1). Stem-like cells generated by SNP-IV proliferated and differentiated into effector cells upon checkpoint blockade with anti-PD-L1, leading to superior antitumor response as compared to SNP-SC in a therapeutic model. The duration of antigen presentation by dendritic cells influenced the quality of CD8<sup>+</sup> T cells. These data demonstrate how to modulate vaccine parameters for specific generation of effector or stem-like CD8<sup>+</sup> T cells. Altogether, SNP-7/8a is a generalizable approach for codelivering peptide antigens and adjuvants in nanoparticles for inducing anticancer T cell immunity.



**19 January 2021 (Tuesday)**

**9:00am – 10:00am**

**Join Zoom Meeting: [LINK](#)**

**Meeting ID: 938 2223 5166**

**Passcode: 504627**

*Seminar is open for all to attend.*

*Registration is not required.*

8A Biomedical Grove, #04-06, Immunos Building, Biopolis, Singapore 138648

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