GRADUATE STUDENT SEMINAR

Deciphering the traits of human immune response to live attenuated Japanese Encephalitis vaccination and infection

Japanese Encephalitis (JE), an infectious disease of the central nervous system, is the most common type of viral encephalitis in Asia. The live attenuated SA 14-14-2 is currently, the most widely established vaccine against JE, and part of India's National Immunization Programme in JE endemic states. With neutralizing antibodies being the focus of "Correlates of Protection" for this vaccine, very few studies have looked into the cellular response elicited to SA 14-14-2.

Utilising single dose vaccination model in adult cohort, we have found that SA14-14-2 immunization achieved only 66% seroconversion and 38% seroprotection among previously unexposed population, with the magnitude of neutralizing response being drastically lower than in natural JE infection. We also found that the individuals who did not seroconvert had significantly lower frequency of JE specific T Follicular Helper (Tfh) cells and a suboptimal T cell-B cell cross-talk as seen through ex-vivo coculture experiments. Our study reveals a crucial role for T cells in orchestrating a potent humoral response in live attenuated JE vaccination.

Suvechchha Pandit

Vaccine Immunology Laboratory

4:00 PM | THURSDAY | 25 APRIL 2024

AUDITORIUM, NII

GRADUATE STUDENT SEMINAR

Nano-delivery platform to reprogram the antigen presentation by professional antigen-presenting cells to induce anti-tumor immune responses

One of the most important immune evasion mechanisms exerted by cancer cells involves the downregulation of tumor-associated antigen (TAA) presentation by professional antigen-presenting cells (APCs), leading to sub-optimal anti-tumor T cell activation. To empower professional APCs in the tumor microenvironment, we have formulated mesoporous silica nanoparticles capable of carrying TAA and displaying endosomal escape-promoting molecules on their surface. Inspiringly in the *in-vitro* setup, these nano-formulations modulate the antigen presentation ability of professional APCs capable of eliciting a higher magnitude of antigen-specific CD8+ T cell activation through predominant class-I MHC mediated antigen presentation. Further, we evaluated the effectiveness of the antigen-loaded mesoporous silica nanoparticles in providing anti-tumor immunity in-vivo in the prophylactic melanoma mouse model. Encouragingly, we observed that the antigen-loaded mesoporous silica nanoparticles inhibit tumor growth and enhance the survival of the immunized mice compared to control mice.

Khushboo Chaudhary

Nano-Biotechnology laboratory

4:30 PM | THURSDAY | 25 APRIL 2024

AUDITORIUM, NII