Peyer's patches have a potential role not only in the mucosal but also in the systemic immune responses against pathogens. Recently, Peyer's patches and their immune cells are important to be targeted with pesticides or antigens for nanomedicine and nanomedicine applications. Nanoparticles have several advantages as good models for vaccine delivery. Nanoparticles uptake by Peyer's patches introduces the possibility of accommodating vaccines for oral immunization. Particles size is one of the most important factors in the uptake and foreignness of nanoparticles and the gastrointestinal tract especially Peyer's patches. In this work, these nanoparticles have characteristics such as controllable size, surface charge (approximately ±50 m), mucosal and passive surface membrane-associated receptors containing lipid bilayer and their antibodies. These factors might be optimal for studying vaccine delivery and the immunological interactions between particles size and immune cells such as M cells of Peyer's patches and plasma cells of all lymph nodes. This work introduces important information of the Peyer's patches immune responses using different sized organosilica particles.