1. No.
   2019Y005

2. Title
   Elucidation of the role of nicotine and nicotine receptors in the development of psoriasis

3. Period
   2019-2021

4. Summary
   The neurotransmitter acetylcholine (ACh) stimulates nicotinic acetylcholine receptors (nAChRs) expressed in both excitable and non-excitable cells. Cholinergic signaling in non-excitable cells induces anti-inflammatory responses. It is reported that the cholinergic anti-inflammatory system inhibits the development of inflammatory diseases such as multiple sclerosis, colitis and rheumatoid arthritis.
   The subunits of nAChR are expressed in different layers of the epidermis. Cholinergic anti-inflammatory signaling is involved in the development of cutaneous inflammatory diseases. However, the role of nAChR-related signaling remains unclear in psoriasiform dermatitis. In this study, a mouse model of imiquimod-induced psoriasiform dermatitis demonstrated impaired cholinergic signaling. However, the nAChR subunits expression remained almost unchanged. Nicotine, a nonselective nAChR agonist, ameliorated the dermatitis phenotype and abnormal cholinergic signaling. The therapeutic effect of nAChR-signaling was independent of nAChRα7. Taken together, these results suggest that nAChR-mediated cholinergic anti-inflammatory signaling might be a good therapeutic target for treating dermatitis.