Pollen allergies would often cause hypersensitivity syndromes in human body, including asthma, rhinitis and conjunctivitis, which appear in the same patient simultaneously during the pollen season (Sofiev, Belmont , etc. , 2013 ).The key role in the pollen allergies mechanism is the IgE(antibody immunoglobulin E), which is a class of antibodies in humans. Human body would overproduce IgE in response to the exposure of allergenic pollen in the membranes lining the nose. The allergens then attach to the IgE on the surface of certain immune cells, which would release chemicals that can cause inflammation and increase mucus in human airways. Allergenic rhinitis symptoms may begin, such as rhinorhea, nasal obstruction, nasal iching and sneezing (Brozek, Bousquet 2010)

Sensitization occurs at the site of primary allergen exposure, i.e. airways, but can also occur through dermal contact. However, not everybody who is exposed will become sensitized and have allergic reactions. Aside from the individual exposure conditions, there is high variability in individual responsiveness to a given allergen dose.

Pollen grains, comparing to other allergen carries in outdoor as well as indoor air, have relatively larger size– with a diameter between typically 15 and 60 µm – from anemophilic plants that include trees, grasses and weeds which produced great quantities of lightweight pollen grains in the pollen season. In this paper, we consider five different species, ragweed (Ambrosia), mugwort (Artemisia), birch (Betula), grass (Gramineae) and oak (Quercus). Since whole pollen grains are generally too large to penetrate into the respiratory tract, pollen grains could only adhere to the outside membrane of the respiratory tract or the dermal skin. ([Behrendt and Becker 2001](#_ENREF_1)).