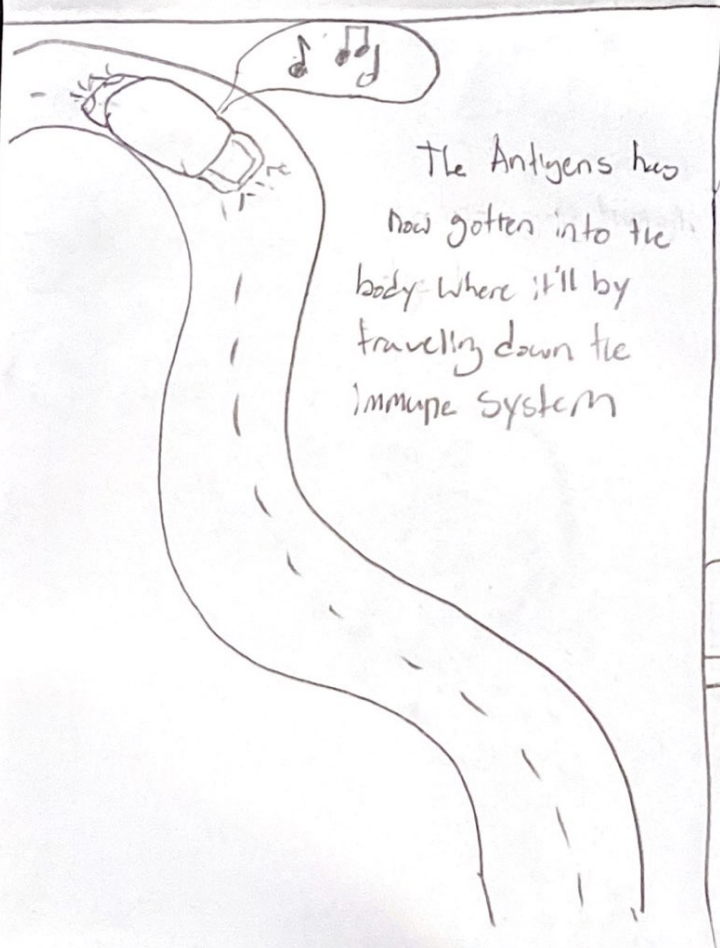
Today we will be showing how hypersensitivity Type I works.

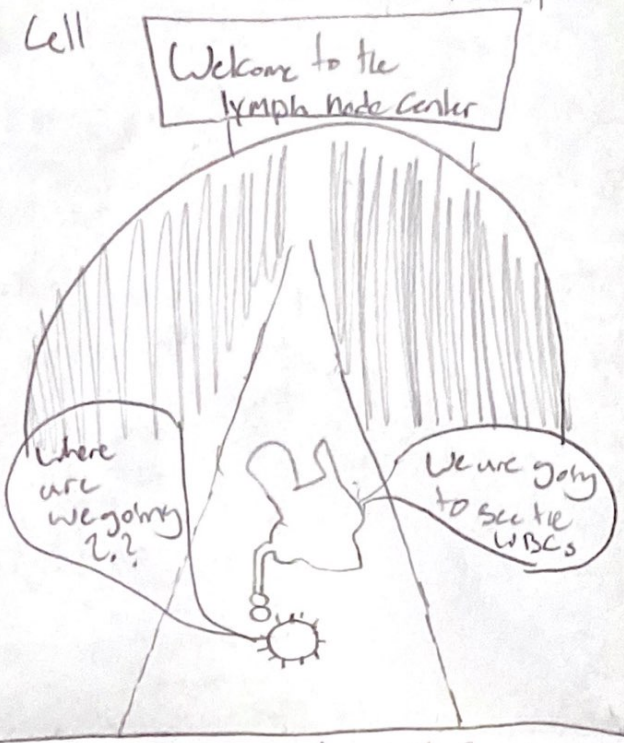
First step shown will be the first exposure of this Antigen (sensitization)



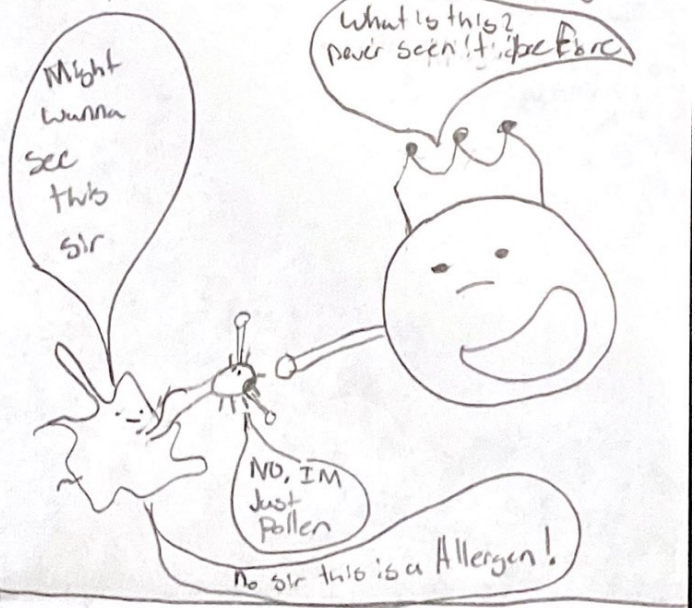
The Antigens have now gotten into the body where it'll by travelling down the immune system

After the Antigen will be picked up by the immune cells and will be taken to the lymph nodes

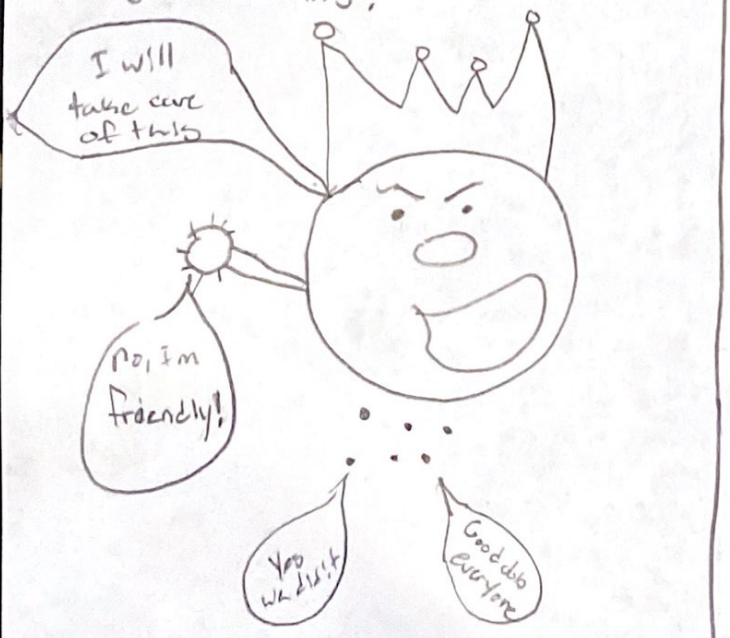
When the immune cells take the Antigens to the lymphnodes, they present the Antigens to the Naive T-helper cell



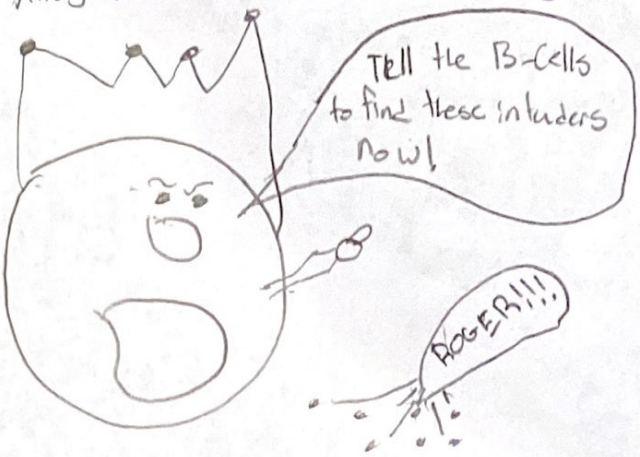
When the immune cell presents the Antigen and our body is allergic to it, the Naive thelper cell will becomes a prime T-helper (T_H2) This happens from the Antigen presenting cells will also bind a Co-stimulatory Molecule to alert the T-cell our body is allergic to it



The T-cell transforms to a T_H2 when the T-cell binds with the Co-stimulatory Molecule and Antigen when they're Cytokines around that sway the t-helper cells to change called Interleukins.

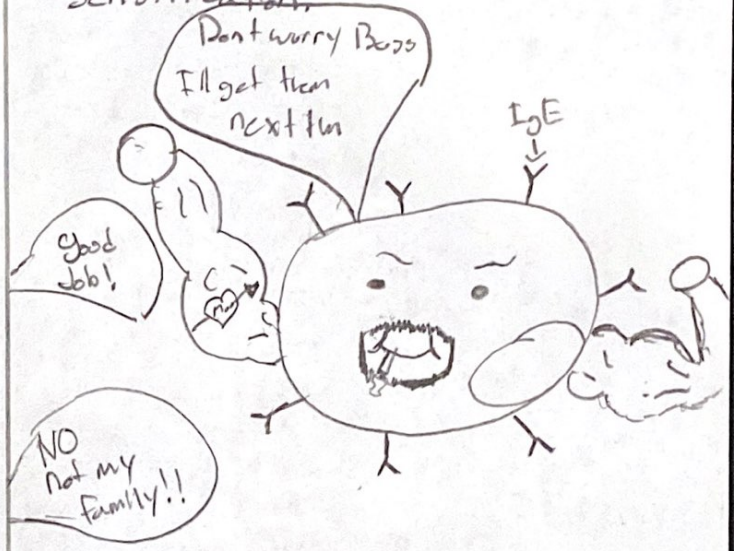


After the transformation, the T_H2 will signal the B-cells to stop the production of IgM antibodies to IgE which are the Immuno Globulins that bind with the Allergin.



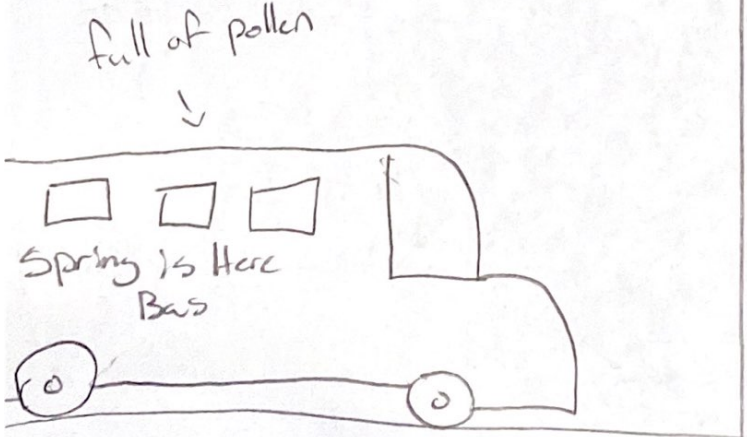
It doesn't stop there. The T_H2 will also signal Eosinophils with a different type of Interleukins where the Eosinophils will be triggered to degranulate to damage cells.

After the B-Cells start mass producing there IgE specific to pollen, the IgE will attach to a Mast Cell with the FCE receptors and arm themselves for the next time pollen is detected This is the end of the first stage called Sensitization.

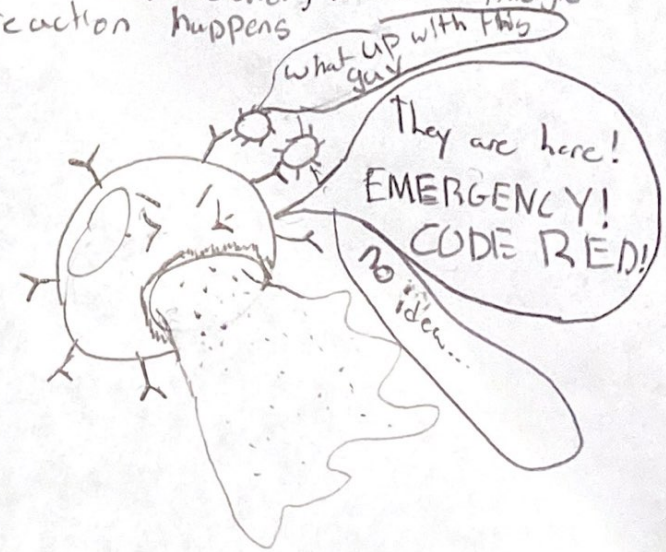


Note: You don't usually get an allergic reaction Your first exposure because of this.

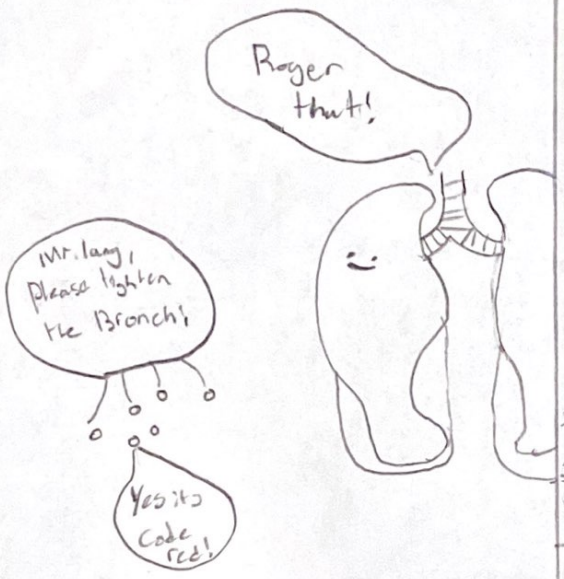
Now here's the second stage called Subsequent Exposure. This is when you get exposed the second time and where the Allergic reactions that we all know about comes in.



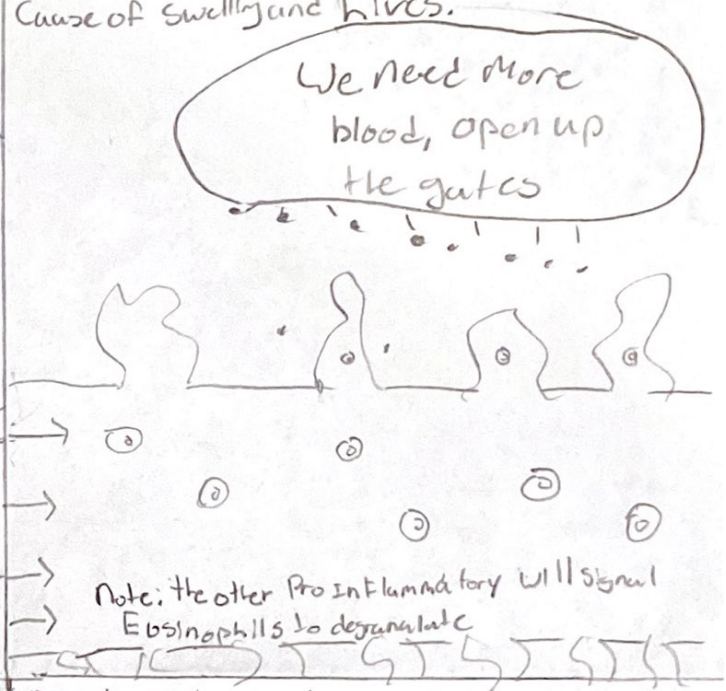
The second time an exposure comes, these Mast Cell attach to more the one Allergen and starts to degranulate. This releases pro-inflammatory Mediators where the Allergic reaction happens



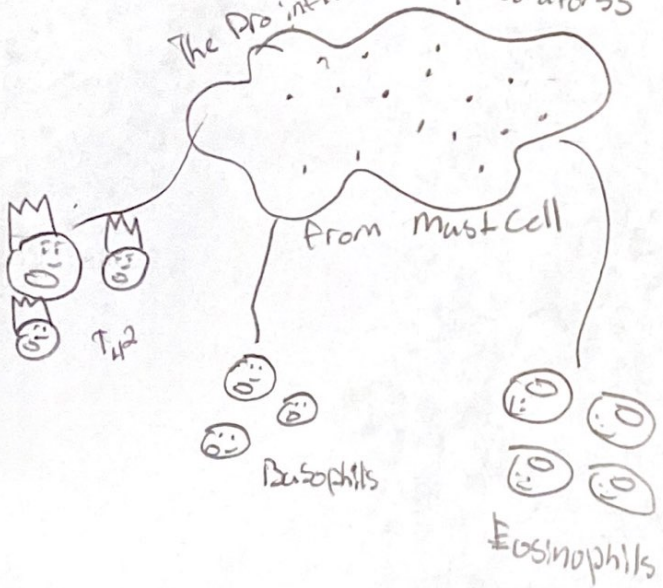
One compound that the Mast cell is sending out is called histamine, this job is to signal the bronchi smooth muscle to contract which makes it difficult to breath.



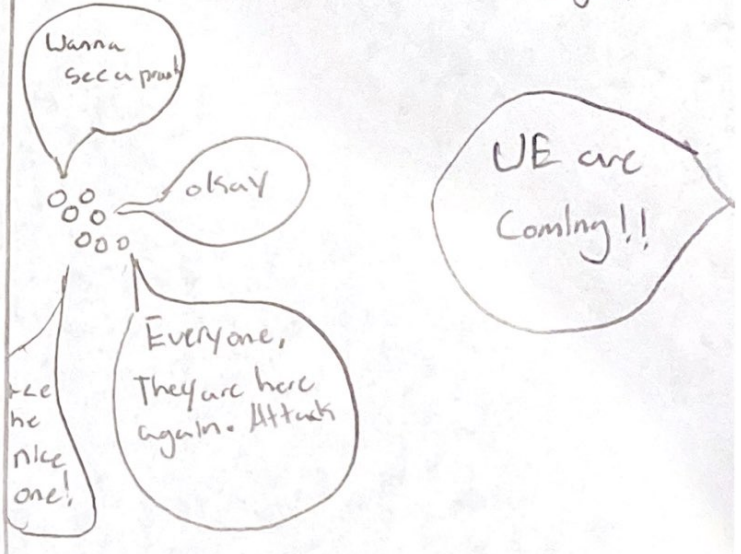
The histamine also activates the blood vessels to dilate and open up the blood vessel walls. This will increase the blood flowing to the locations that is needed and the fluid can get out into the interstitium. This is the cause of swelling and hives.



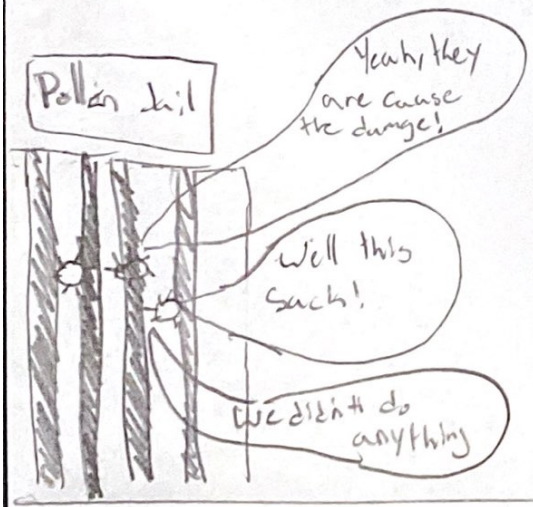
These were the early phases of this stage where there is also a late phase that happens 8-12 hours after.



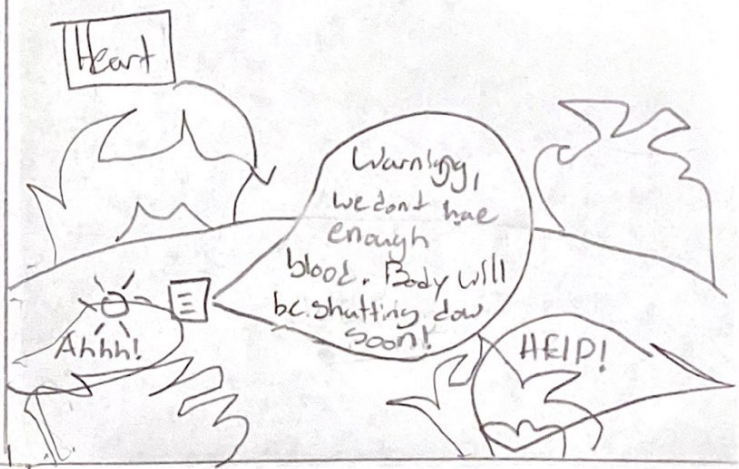
One other molecules that this phase produces are Leukotrienes. Leukotrines are made out of fatty acid and facilitate Comunication between a local group of cell, what these molecule does is contract the smooth muscle where the Allergen was detected and also attract more neutrophils, mast cells, and eosinophils even way after the exposures of Allergen.



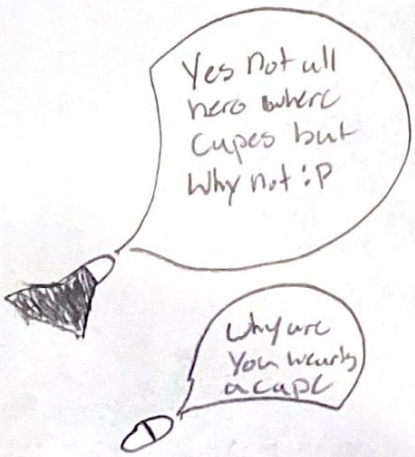
Now people usually have mild symptom like hives, asthma, nose inflammation, and rashes. this is usually where pollen is at.



There are times though where these reactions are worse. when there's a large load of Allergens entering the body, there can be a larger vascular permeability and Airway getting more Constriction. When this happens, the Vital organs aren't to recieve enough Oxygen-rich blood where the body will go into anaphylactic shock



Not to fear, there is some treatment for the mild to severe symptom. For the mild symptom you may take Antihistamines which will block histanine to spread around the body. This will lower the vascular permeability and bronchoconstriction.



For more severe symptom, You may want to seek medical attention and have a Corticosteroids (which will reduce inflammatory response) or Epinephrine. Epinephrine will Constrict blood vessels to control the blood flow. This usually come in a epi pen where it will be injected through your body!