

## Ocular Allergy

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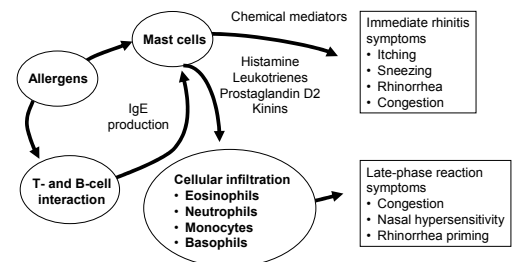
## Ocular Allergy

- Allergic disease is common
    - Allergic rhinitis 20%
    - Asthma 7-8%
    - Allergic conjunctivitis ? underreported probably 20%
- These are percentages of the general population.

## Ocular Allergy- What is it?

- Allergic reactions occur when pre-formed IgE antibodies bound to IgE receptors on mast cells encounter the antigen for which they have specificity.
- Cross linkage of adjacent IgE antibodies by antigen activates the mast cell and it degranulates.

## Mechanism of Allergic Reaction



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## Ocular Allergy

- Allergic reactions always have two phases
  - Early phase
    - Histamine
    - Leukotrienes
  - Late phase
    - Cytokines

## Ocular Allergy- early phase

- Histamine is released within minutes of mast cell activation.
- Histamine results in:
  - Itching
  - Swelling
  - Mucous production/watering
  - Recruitment of inflammatory cells (chemotaxis)

## Ocular Allergy-early phase

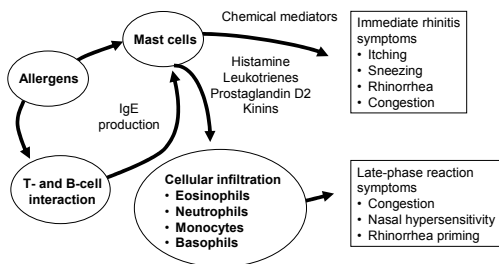
- Leukotrienes are released from mast cells 20-30 minutes after histamine is released.
- Leukotriene C4 ( LTC4) is a more potent vasodilator than histamine.
  - Results in more profound
    - Swelling
    - Tearing/watering
    - Recruitment of inflammatory cells (chemotaxis)

## Ocular Allergy-late phase

Mast cell activation results in expression of cytokine genes. Cytokines released in the local area of inflammation activate inflammatory cells recruited by histamine and leukotrienes.

Activated inflammatory cells perpetuate the inflammatory response.

## Mechanism of Allergic Reaction



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## Ocular Allergy-late phase

- Late phase allergic reactions are cascades.
  - They grow rapidly
  - Self sustaining

You have to turn off late phase allergic reactions.

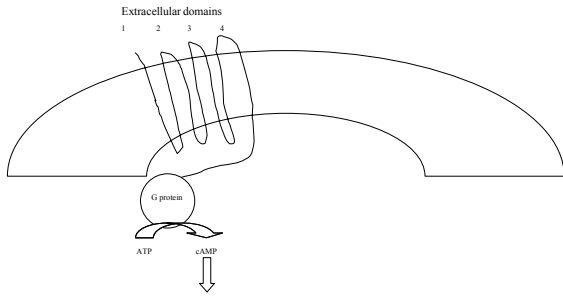
## Allergic Rhinitis: Treatment Modalities

- Allergen avoidance
- Pharmacotherapy
  - antihistamines (oral and topical)
  - Decongestants (topical)
  - Steroids (oral and topical)
- Specific immunotherapy

## Allergic Rhinitis: Avoidance

- Allergen avoidance effective for
  - Dust mites
  - Pets
  - Mold ?
- Not effective for
  - Pollens levels tend to be higher in AM
  - Mold ?

## Histamine Receptors



## Antihistamines: affinity

- Affinity is defined as the strength of the interaction between two objects.
- The stronger the affinity the longer two objects will be bound together.
- This concept holds true for all protein interactions.
- Affinity is estimated by disassociation constants.

## Antihistamines relative affinities

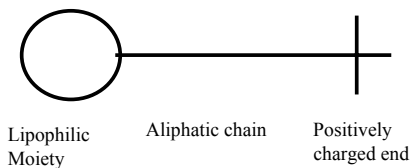
Benadryl	1
Allegra	1
Claritin	1.8
Zyrtec	3.7
Atarax	88
Clarinex	201
Doxepine	779

J. Ring Allergy 2001;56:28 32

## Allergic Rhinitis: Antihistamines

- All oral antihistamines (and most topical) available in this country are competitive inhibitors of the H1 histamine receptor.
- Astelin/Optivar is a non-competitive inhibitor of the H1 receptor. It binds to the membrane and sterically inhibits the H1 receptor site

## Allergic Rhinitis: Astelin



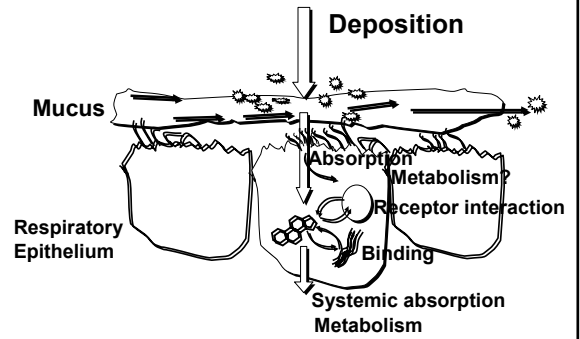
## Allergic Conjunctivitis: Optivar

- Unique properties found in Optivar topical antihistamine drops
  - relieves congestion @ 70% of the time
  - onset of action 15-30 minutes
  - shown to have some anti-inflammatory properties similar to steroids
  - effective for non-allergic rhinitis as well as allergic rhinitis

## Allergic Rhinitis: Optivar

- Inflammatory effects seen with Optivar
  - decreased ICAM 1 expression
  - decreased influx of eosinophils and other inflammatory cells
  - decreased 5 lipoxygenase activity
  - decreased substance P in nasal secretions
  - decreased cytokine production
  - **All of these effects are due to interruption of signal transduction**

## Glucocorticoids Used Topically...



## Glucocorticoid Interactions With Target Cells

