

# PeriodicGraphics

## With Compound Interest

A collaboration between C&EN and Andy Brunning, chemistry educator and author of the popular graphics blog Compound Interest. To see more of Brunning's work, go to [compoundchem.com](http://compoundchem.com).

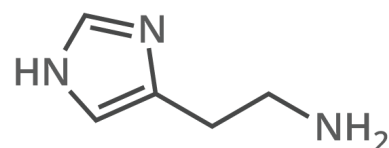
## ALLERGIES & ANTIHISTAMINES

It's currently the time of year when allergies plague many of us. Here, we shine a light on one of the chemical culprits in allergic reactions and some of the medications that help relieve runny noses and itchy eyes.



### ALLERGIC RESPONSE

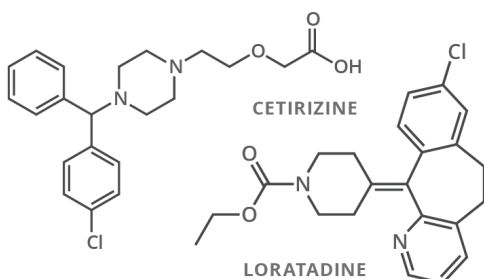
Scientists think allergies occur as a result of the body's immune system "overreacting" to allergens such as pollen and producing antibodies to combat them. These antibodies trigger the release of chemicals that produce an inflammatory response.



### HISTAMINE

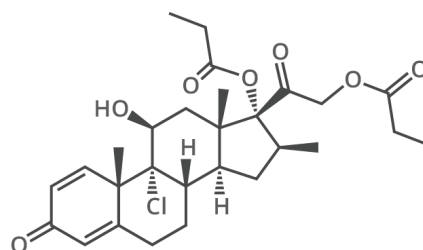
Histamine is one of the key chemicals involved in an allergic reaction. It helps trigger an immune response. When allergens trigger histamine's release from mast cells, it causes smooth muscle to contract, which can lead to airway constriction.

### ANTIHISTAMINES



Histamine exerts its actions by binding to proteins in the body called  $H_1$  receptors. Antihistamines work by also binding to  $H_1$  receptors, blocking histamine's path and thereby preventing the allergic response. If histamine is already bound to the receptors when antihistamines are administered, however, the drugs can't easily disrupt the interaction. So they should ideally be taken when allergy symptoms are expected, rather than after they've started.

### OTHER MEDICATIONS



BECLOMETASONE DIPROPIONATE  
(Corticosteroid)

Corticosteroids such as beclometasone act elsewhere on the immune system to reduce allergy symptoms, rather than blocking the action of histamine directly. They can take several days of dosing to reach their full preventative power, though they are considered to be more effective than antihistamines. Sodium cromoglycate, commonly used in eye drop solutions, helps prevent the release of histamine.



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