Introduction
It has been reported that imidazole dipeptides such as anserine or carnosine produce effects of pollinosis depression, fatigue restorative and anti-aging. We have discovered that HAQ(His-Ala-Gln) imidazole tripeptide inhibited the degranulation of RBL-2H3 cells.

Materials & Methods

In vitro assay
The peptides used were low molecular weight HAQ (His-Ala-Gln), HHH (His-His-His), QHA (Gln-His-Ala), AQH (Ala-Gln-His), Carnosine (β-Ala-His).

Measurement of Degranulation
Degranulation of RBL-2H3 cells was monitored by measuring activity of released β-hexosaminidase. For antigen stimulation, DNP-specific IgE-primed RBL-2H3 cells were preincubated for 10 min with various concentrations of peptides, then stimulated with DNP antigen (mouse anti-DNP IgE). After 30 min, the medium was collected and 0.2% Triton X-100 was added to the cells. Levels of β-hexosaminidase released into the medium and within cells were determined by colorimetric assay using p-nitrophenyl-2-acetamido-2-deoxy-β-glucopyranoside and expressed as the percentage of activity release compared to total activity.

Results

Effects of H, HH, HHH and HAQ peptides on β-hexosaminidase release from RBL-2H3 cells.

A significant inhibitory effect on the release of β-hexosaminidase was found with all imidazole peptides, depending on the dose.

In vivo assay
Animals: Female C3H/HeJ mice weighting 10~20g
Oral administration of HAQ peptide: 1~14 days, 1 mg/ mice/ day.
Schedule of Lysozyme from hen egg white (LHE) sensitization: Intraperitoneal injection 1st: 100μg of LHE/ 1mg Al(OH)₃ 2nd: 50μg of LHE/ 1mg Al(OH)₃ An interval of 7 days between 2 injections

Assessment of allergy symptoms

Conclusion
The level of degranulation inhibitory activity depended on the number of histidine residues in peptide, and peptide sequence specificity is important for the manifestation of degranulation inhibitory activity. It was suggested that HAQ peptide has anti-allergic effect in vitro and in vivo.