

## アレルギー診断に向けたヒスタミン特異計測の検討

### Study on specific monitoring of histamine for allergy test

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### Introduction

Allergy is a kind of closest disease in the worldwide and there is nearly half of Japanese population suffers from allergy. At present, the diagnosis of allergy takes long time and uses large amount of patient blood but less of accuracy. In order to develop a convenient and precise way for allergy diagnosis in clinical test, we consider histamine as the signal chemical secreted during type I allergy reaction to make a device to detect allergy. In this research, we made biosensor combine with field effect transistor (FET) and molecular imprinting polymer (MIP) for the selective device detecting histamine.

### Experiment Methods and Results

#### Detection of Histamine by Extended Gate FET (EGFET) and MIP

From the previous research, we already sensed histamine secretion of allergy by Ion-sensitive FET (ISFET). We chose to use EGFET for modifying the gate surface by MIP to make selective device. MIP gel coated-gate FET with histamine template was fabricated by direct UV polymerization onto the Au gate electrode using monomers, which were consisting of acrylic acid as a main chain, ethylene glycol dimethacrylate as a cross linker, and mixing the target molecule, histamine, dissolved in dimethyl sulfoxide/water. After polymerization, histamine was removed from polymerized MIP film using organic solvent. The MIP gel we are using is composed by histamine 0.01g, acrylic acid 0.013g, EGDM 0.15g, DMSO up to 0.85g, PBS up to 1.0g. Up till now, we could sense histamine concentration at 0.1 $\mu$ M.

#### Confirm the selectivity of MIP for histamine

MIP works by the shape of target template and the function group link between MIP and target. In case when similar chemical of histamine affecting the result, we choose nicotine amide and histidine to check the selectivity of MIP for histamine. By the MIP device made for histamine, Nicotine amide and histidine solution at same concentration of histamine have been sensed. Regarding this results, we would like to talk about the details in the conference.