

Anti-pollen/Anti-virus polymer

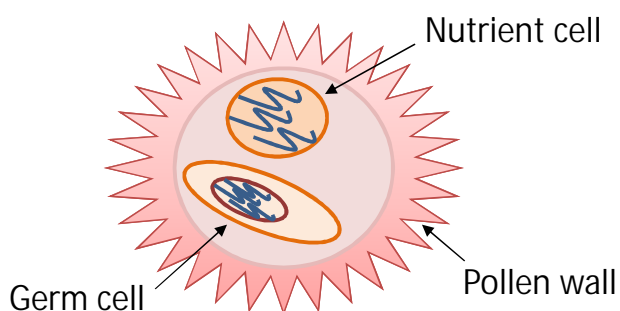
p-MEB / STOUT / AP polymer 560

Osaka Organic Chemical Industry Ltd.

Structure of pollen/virus

CONFIDENTIAL

Pollen



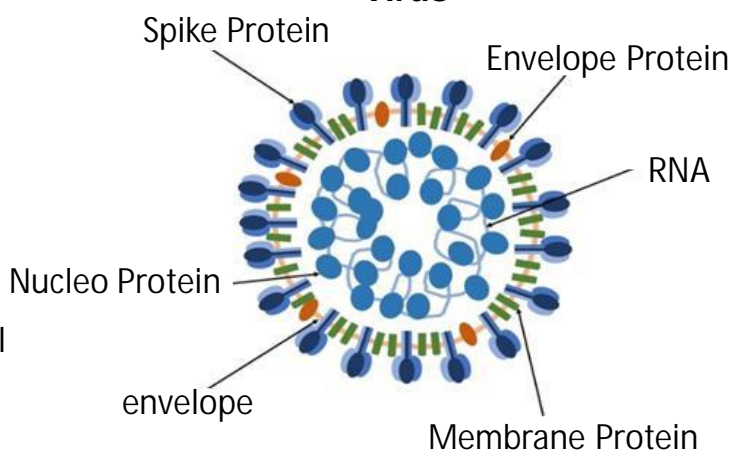
Pollen wall

Pollen wall is consist of proteins

Germ cell/Nurrient cell

Cells are consist of proteins

Virus



Spike Protein

Spike protein is consist of proteins

Membrane protein

Membranes are consist of proteins

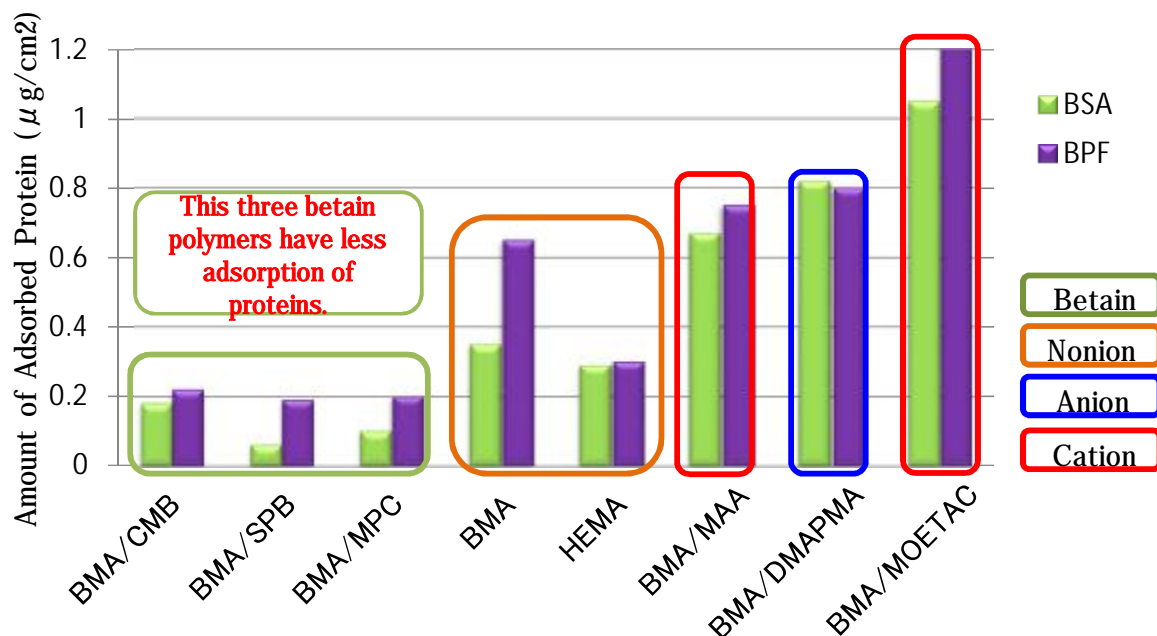
Surfaces of pollen and virus are consist of proteins

Biocompatible polymer for medical devises CONFIDENTIAL

We have been researching polymers that don't have adsorption of proteins for medical device from 2002.

We found that polymers with betaine structure have less protein adsorption.

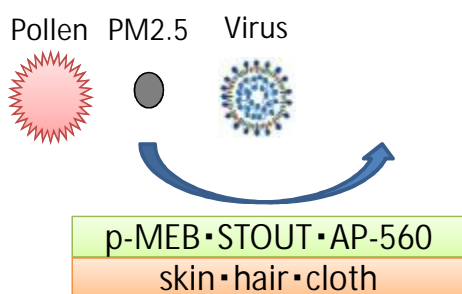
In particular, The polymers of CMB(Carboxy Methyl Betain Monomer) have less adsorption of proteins and cells, and this polymers can also be used as cosmetics.



BSA (Bovine serum albumin), in PBS at 3.9mg/mL pI=4.7-4.9
BPF (Bovine plasma fibrinogen), in PBS at 0.3mg/mL pI=6.0

Hiromi Kitano et al., *Macromol. Biosci.* 2009, 9, 63.
JP PATENT 496133(2005)

Anti-pollen/Anti-virus polymer CONFIDENTIAL



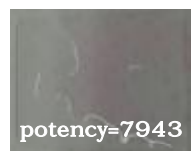
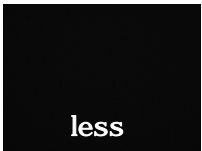







Noted : This is a sample image.

Product name	p-MEB	STOUT	AP Polymer 560
Content	20%	30%	30%
Solvent	water	ethanol	ethanol
INCI Name	Polymethacryloyl Ethyl Betaine	Methacryloyl Ethyl Betaine / Acrylates Copolymer	Acrylates/VP/Dimethylaminoethyl methacrylate/ Diacetone acrylamide/Hydroxypropyl acrylate Copolymer
Japanese cosmetics labeling name dictionary	ポリメタクリロイルエチルベタイン	(メタクリル酸エチルベタイン/アクリレート)コポリマー	アクリレート/アクリル酸ヒドロキシプロピル/メタクリル酸ジメチルアミノエチル/ジアセトンアクリルアミド/VP)コポリマーAMP
China INCI	聚甲基丙烯酸酯基乙基甜菜碱	甲基丙烯酸酯基乙基三甲胺乙内脂/丙烯酸(酯)类共聚物	丙烯酸(酯)类/VP/甲基丙烯酸二甲氨基乙酯/双丙酮丙烯酸酯/丙烯酸羟丙酯共聚物

These polymers have less adsorption of protein ,
so the surface of these polymer has less adsorption
of pollen and virus.
Covering your skin and clothing with this material
reduces the risk of bringing pollen and viruses indoors.



Product name	Cells	Pollens	Virus
Non coating	 many	 many	 potency=7943
Surface of p-MEB /STOUT	 less	 less	 potency=316
Surface of p-MEB /AP polymer 560	 less	 less	 potency=501

Cells : NIH3T3

Pollen : Cedar pollen

Virus : Influenza virus

Anti-pollen/Anti-virus polymer

Mist Cosmetics

INCI Name	wt%
Water	97.54
p-MEB	0.25
1,2-Hexandiol	1.50
Betaine	0.50
Phenoxyethanol	0.20
50%Citric Acid	0.01

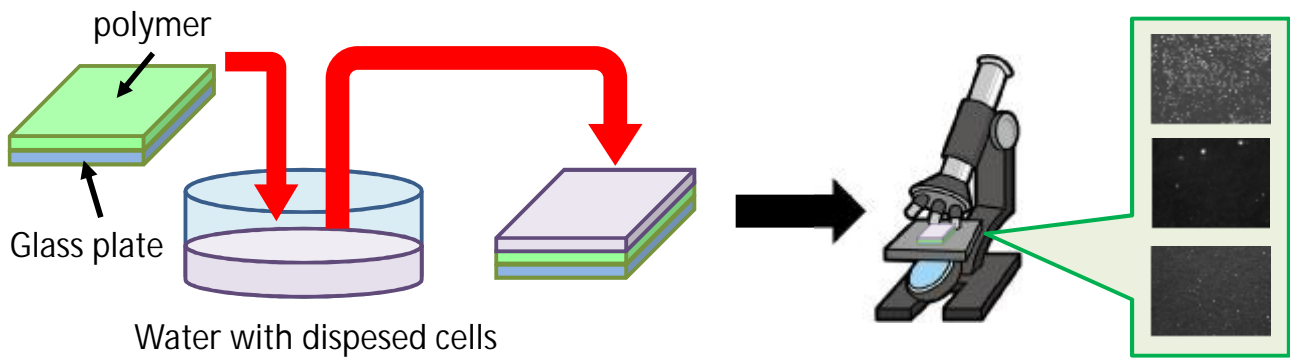
Mist Cosmetics

INCI Name	wt%
Water	91.79
AP Polymer 560	6.00
1,2-Hexandiol	1.50
Betaine	0.50
Phenoxyethanol	0.20
50%Citric Acid	0.01

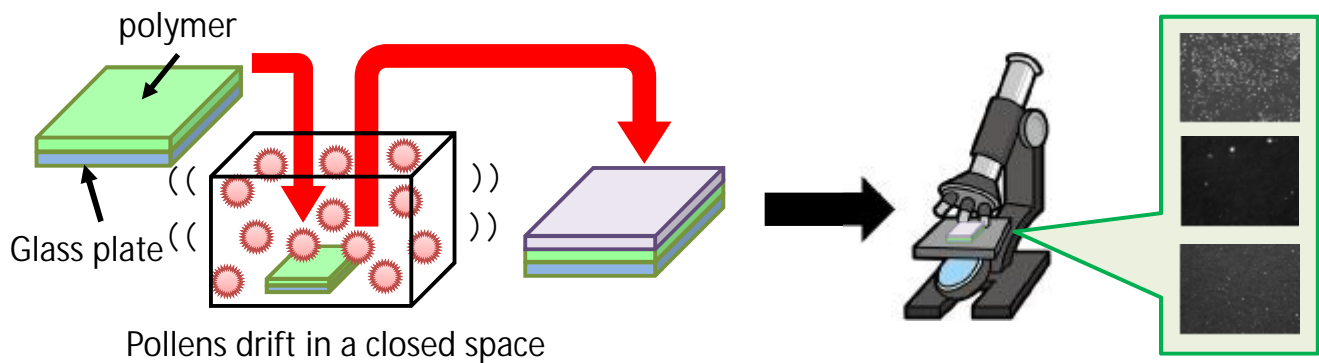
Evaluation methods

CONFIDENTIAL

◆ cell



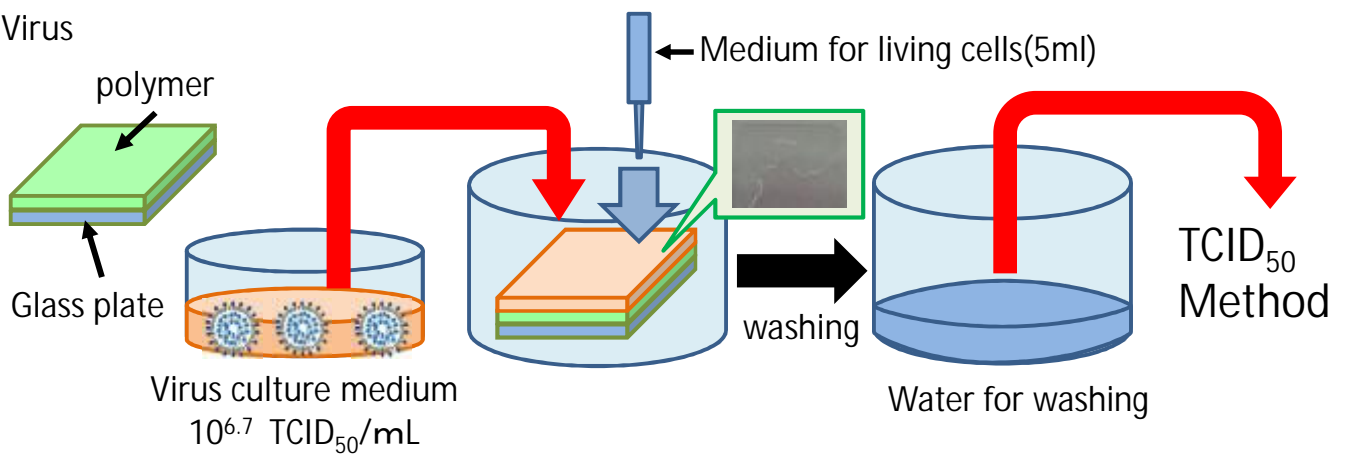
◆ pollen



Evaluation methods

CONFIDENTIAL

◆ Virus



Contact us

Osaka Organic Chemical Industry LTD.
Specialty Chemical Section

SHIN TOYAMA BLDG.
1-7-20,AZUCHIMACHI CHUO-KU,OSAKA,
541-0052 JAPAN

TEL : 06-6264-5076 FAX : 06-6264-7466

