

# Vegetamide<sup>®</sup> 18MEA-G Vegetamide<sup>®</sup> 18MEA-R

The hair conditioning ingredients created by focusing on hair surface structure

## Introduction ~The hair surface structure and its damage~

Cuticle is an important component controlling the characters of hair. The most outer layer of cuticle is called F-layer having a unique structure where 18-methyl eicosanoic acid (18-MEA), a branched aliphatic acid, is found to connect with proteins near the surface through thioester bonds and ester bonds. F-layer is thought to play an important role in allowing the surface of hair to be hydrophobic, which also play a role not only as a barrier protecting hair from outside stresses, but also in enhancing the sensory characters of hair including kempt and flexible hair texture and a beautiful luster as a symbol of healthy hair.

When the surface of hair is damaged, thioester bonds and ester bonds composing F-layer are broken with losing 18-MEA, resulting in the loss of hair-hydrophobic barrier function. The destruction of hydrophobic barrier due to the change of the hair surface structure accelerates the progress of hair-damage further, gives a hair structural destruction including peeled cuticles and the loss of internal components, and forces hair to lose its characteristic sensory texture that is the symbol of healthy hair.



## What's Vegetamide? ~Pseudo F-Layer~

### New Multi-chain Ion Complex

### Made From Plant

The carboxylic groups of peptide have been bound to cationic substances having C16~C18 alkyl groups with ionic bonds



#### Vegetamide 18MEA-G

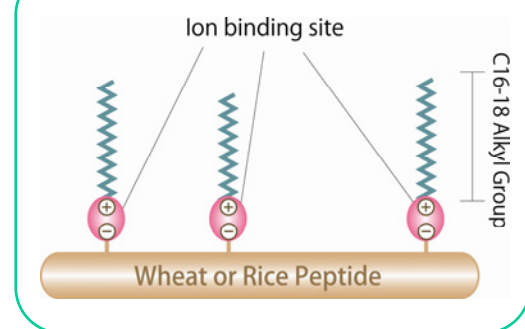
INCI Cetearamidoethyl Diethonium Hydrolyzed Wheat Protein (in process)



#### Vegetamide 18MEA-R

INCI Cetearamidoethyl Diethonium Hydrolyzed Rice Protein (in process)

### Illustrated structure of Vegetamide



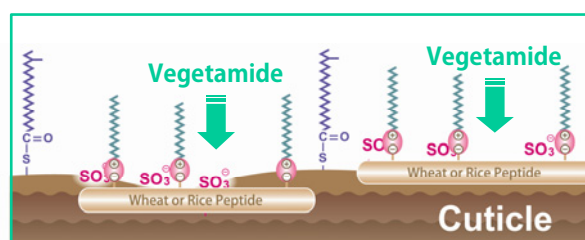
## Functions of Vegetamide

Vegetamide functions as a replacement for lost F-layer, and repairs the damaged hair surface

Selective adsorption to the damaged part of hair

Hydrophobizing

Texture improving





## Selective adsorption to the damaged part of hair

### Experimental method

#### Preparing fluorescent-labeled Vegetamide

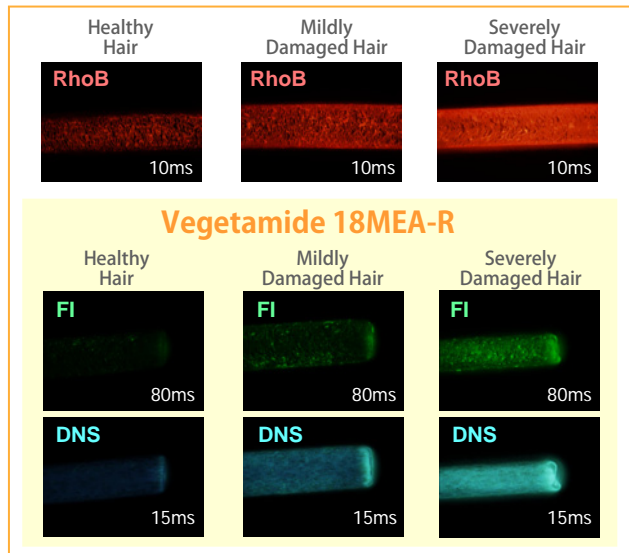
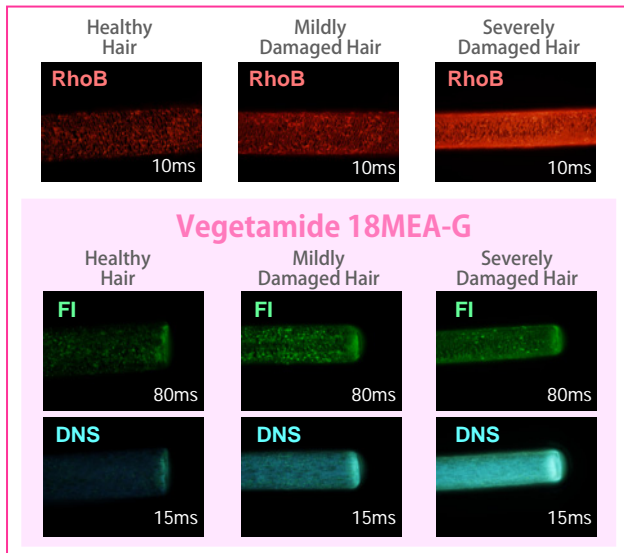
Approximately 1/10 equivalents of fluorescein isothiocyanate (FITC) were bound with one amino-terminal of peptide of Vegetamide, and approximately 1/10 equivalents of alkyl chains of Vegetamide were replaced with dansyl groups (DNS), resulting in fluorescent-labeled Vegetamide labeled with 2 different fluorescent materials.

#### Test-1: Visualization of damaged degree of hairs

Hair samples; Healthy hair, Mildly damaged hair (once-bleached), and Severely damaged hair (5-consecutively bleached) were soaked in 0.01% RhoB for 15 min at room temperature, washed with water, and dried, and the surfaces of hairs were observed a epi-illumination type fluorescence microscope (BX-51-FL) (Olympus, Tokyo, Japan).

#### Test-2: Visualization of adsorbing ability of fluorescent-labeled Vegetamide to hairs

3 different types of Hair samples were soaked in 0.3% active matter fluorescent-labeled Vegetamide aqueous solution for 5 min, washed with water, and dried, and for determining the adsorbed amount, the surfaces of hairs were observed by a fluorescence microscope.



Vegetamide selectively adsorbs to the damaged part of hair

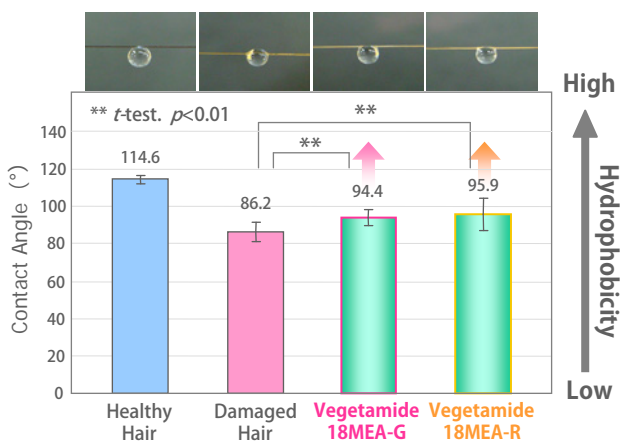


## Hydrophobizing

### Experimental method

Damaged hairs, prepared with a 5-consecutive-bleach treatment, were soaked in 0.3% active matter Vegetamide aqueous solution, and then treated for 10 min at 40°C. The hairs were washed with water and dried. This process was repeated 5 times.

Approximately 1 µL of ion-exchanged water was placed on the surfaces of testing hairs individually, and by measuring the contact angle of water droplet on hair, the hydrophobicity of hair surface was evaluated.



Vegetamide has hydrophobizing ability to damaged hair surface

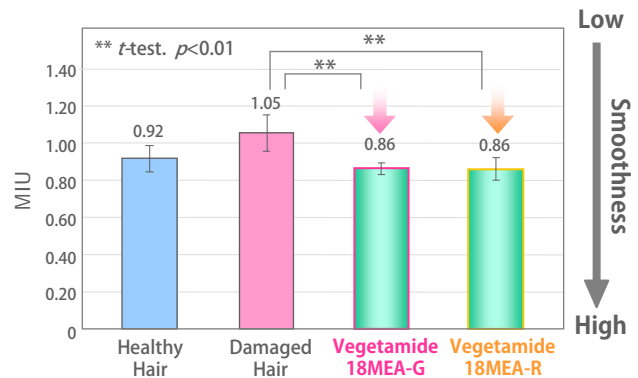


## Texture improving

### Experimental method

Damaged hairs, prepared with a 5-consecutive-bleach treatment, were soaked in 0.3% active matter Vegetamide aqueous solution, and then treated for 10 min at 40°C. The hairs were washed with water and dried.

Twenty sample hair were fixed on a slide glass, and the mean frictional coefficient of hair surface was measured for evaluating the slipping character (smoothness) of hair surface. For measuring the frictional coefficient of surface, sample hairs were stored at 25°C and 20% relative humidity (RH) for overnight, and the measurement was performed at 22~23°C and 43~47%RH by a Friction tester {KES-SE (STP)} (Kato tech, Kyoto, Japan).



Vegetamide improves damaged hair surface

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