Abstract Submitted
for the GEC19 Meeting of
The American Physical Society

**Effects of Plasma-Generated Reactive Species with Different Working Gases on Reaction of Tyrosine**[1] TOSHIRO KANEKO, MAHO YANAGISAWA, KEISUKE TAKASHIMA, SHOTA SASAKI, Graduate School of Engineering, Tohoku University — Non-equilibrium atmospheric-pressure plasma (APP) has recently emerged as a novel tool in medicine and agriculture. Despite the promising potential, it has not yet become a breakthrough technology, because key plasma-generated species and action mechanisms remain unclear in most cases. The key species and mechanisms can be found through fundamental experiment on the interaction of the plasma-generated reactive species with biomolecules such as proteins (peptide, amino acids), phospholipids, and enzymes. In this study, we have examined the interaction of APP with tyrosine, which is one of the 20 standard amino acids and is known to play important roles in many cellular processes through chemical modifications such as nitrosylation and phosphorylation in protein. While observed absorption spectrum of tyrosine solution after He+$H_2O$ APP treatment was broadened to 600 nm, that after air plasma effluent treatment has a well-defined peak around 475 nm, in agreement with previously-reported spectrum of dopachrome. The plasma-generated reactive species delivered into solution is deduced to determine the reaction products. In the presentation, composition of gas-phase reactive species and reaction route with tyrosine in the liquid phase will be discussed.

[1]This work was partially supported by JSPS KAKENHI Grant Number 18H03687.

Toshiro Kaneko
Graduate School of Engineering, Tohoku University

Date submitted: 03 Jun 2019 Electronic form version 1.4