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Effect of terminal functional group of self-assembled monolayers formed on gold surface on the adsorption of Amyloid fibrils by AFM

KOHEI UOSAKI, MASAYA TSUKAMOTO, KAZUYASU SAKAGUCHI, YUYA ASANOMI, Hokkaido University — Amyloid fibril, which is known to cause BSE and Alzheimer disease, is a solid and stable fiber of several tens of nm wide and several \( \mu \)m long and has a potential to be used as nano-materials because functional molecules and metal and semiconductor nano-particles can be attached. However, it is not yet possible to align the Amyloid fibrils on a solid surface as programmed. In this study, interaction between Amyloid \( \beta \) (A\( \beta \)) fibrils and self-assembled monolayers (SAMs) with various functional groups constructed on a gold surface was investigated by in situ AFM. Amyloid \( \beta \)10-35 (A\( \beta \)10-35) peptide was synthesized and the peptide was incubated at 37 deg. for more than a week to obtain the fibril. SAMs of alkylthiols with methyl, OH, COOH, NH2, and SO3 groups were formed on Au(111) surface and AFM images were obtained by MAC mode in a solution containing the fibrils. It was clarified that electrostatic and hydrophobic interactions play important roles in adsorption behavior of the fibrils.

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Kohei Uosaki
Hokkaido University

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