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Surface Induced Self-Assembly of Fibrinogen Fibers in the Absence of Thrombin JASEUNG KOO, MIRIAM RAFAILOVICH, DENNIS GALANAKIS, Stony Brook University — Wound healing is a complex process imitated by the formation of fibrin fibers that are involved in clot formation and fibroblast migration. Normally this process is triggered by thrombin cleavage of the E domain on the fibrinogen molecules, which allows them to spontaneously self-assemble into the fibers. Here we demonstrate that this process can also be initiated in the absence of thrombin. We show that by simply placing the proteins in contact with hydrocarbon functionalized clay surfaces, molecular reorientation occurs which allows fibers to form from the intact fibrinogen protein. Furthermore, using monoclonal antibodies, we determined which regions on the αC domains are involved in the formation of the new fibrinogen fibers. This allowed us to extend these findings to general hydrophobic surfaces, such as those presented by most hydrocarbon polymers. On the other hand, the carboxyl terminal part of the Aα chain, can interact with amine containing polymers, and suppress formation of the fibers.

Jaseung Koo

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