

Solvent-free initiated chemical vapor deposition(iCVD) of functional polymer for site-specific immobilization of proteins

성혜정, 정구민, 정기준, 임성갑\*

KAIST

(sgim@kaist.ac.kr\*)

Current protein biochips face new requirements of improved environmental stability, disposability, and cost-effectiveness for their wide applicability in our daily life. Here, we demonstrated a protein detection platform using vinyl-containing polymer, poly(2,4,6,8-tetravinyl-2,4,6,8-tetramethyl cyclotetrasiloxane) (pV4D4), via solvent-free initiated chemical vapor deposition (iCVD) process. To achieve this platform, highly selective thiol-ene photochemical reaction between vinyl functionality on the surface and Cysteine-linked protein was utilized to immobilize the relevant proteins on the disposable substrates. On the vinyl functionalized surface, Cysteine-linked proteins were covalently immobilized by a UV-assisted thiol-ene click reaction. The immobilized proteins including fluorescent proteins, single chain variable fragment (scFv), and protein scaffold showed high activity after the immobilization on polymer treated substrate which is comparable to that of conventional immunosorbent assay.