

Binding Control between Biomolecules Using a Parallel-Plate Rheometer

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Protein Immunohistochemistry is widely used in medical science. Integration of the probe and target biomolecules generally results from one or more non-covalent interactions: hydrophobic/hydrophilic interactions, ionic bond, positive/negative charge, aromatic  $\pi$ - $\pi$  stacking and other van der Waals forces. We were designed and used by our group as biomolecules substrates using a parallel plate rheometer. Results showed that the shear stress influenced interactions between biomolecules. By changing the shear stress, we are able to control the ratio of specifically-bonded biomolecules to non-specifically-bonded biomolecules. Interestingly, higher accuracy appeared at the high shear stress, where shear stress caused higher shear rate of reaction solution, which means nonspecific binding can be largely replaced by specific binding due to molecular physical interactions. Furthermore, some other kinds of biomolecules were also tested under their optimal conditions to have an overall conclusion.