

Final Report of Bioteam

(Experiment and Simulation on The Albumin Adsorption II)

Bioteam

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1. The Purpose on this term seminar

In the vacation seminar, I understand the surface plasmon resonance principle systematically, and when albumin is adsorbed to gold surface, I study relation between binding reaction and mass transport.

2. The Theoretical Background

To correctly explain binding reactions, it is important to minimize mass transport. These effects occur when the binding rate of analyte to the surface is higher than diffusion of analyte to the surface. Under mass-transport-limited conditions, when the analyte concentration is fixed, binding reaction is proportional to flow rate^{1/3}.

1. The Result of the Experiment

I fixed albumin concentration conditions, which are $5\mu\text{g/ml}$, $25\mu\text{g/ml}$, $50\mu\text{g/ml}$, and $100\mu\text{g/ml}$. Then I experimented to change variable flow rate, and studied relation between binding reaction and mass transport (Fig. 1.).

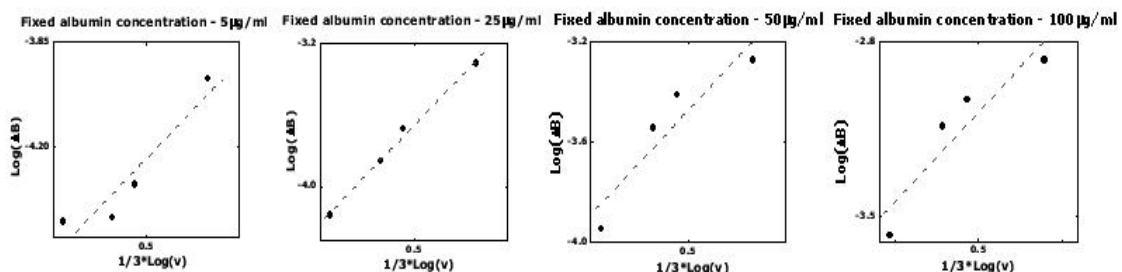


Fig. 1. Relation between binding reaction and mass transport

4. Discussion

As is looked in above experiment result, under limiting conditions of the mass transport, initial binding reaction was found to be proportional to flow rate, which is good accordance with theoretical expectations.