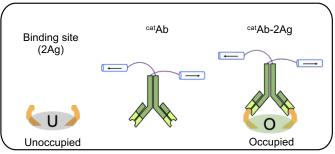
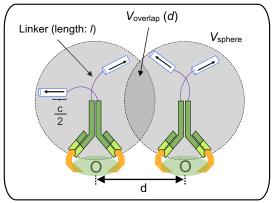
## A Conditions for catenation

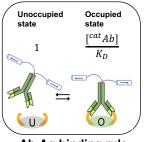


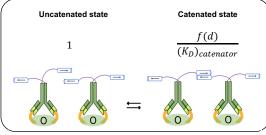
Definitions

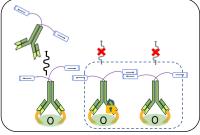


 $V_{\text{overlap}}$  (d): where catenation is possible

## B ABM of catAb-Ag interaction







Ab-Ag binding rule

**Catenation rule** 

Restricted dissociation rule

## C Simulation procedure

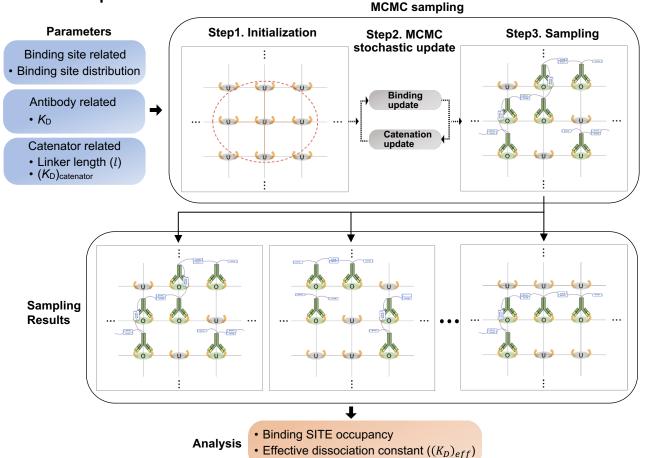


Figure 2