

Supplemental Material

CBE—Life Sciences Education

Host *et al.*

Supplemental material

Closed items used in pre- and post-test

The following ten closed items were used in the pre- and post-test developed and used in the paper:

“Students’ Learning about Biomolecular Self-Assembly using Two Different External Representations”, by Gunnar E. Höst, Caroline Larsson, Arthur Olson and Lena A.E. Tibell.

The items have been sorted according to which of five dynamic facets that they target. True and False statements are indicated by (T) and (F), respectively.

Random molecular collisions

- The self-assembly process of virus capsids proceeds via entirely random collisions between subunits (T)
- A subunit can bind to a complex of subunits if it by coincidence happens to have the proper orientation at the collision (T)

Reversibility

- Sometimes a subunit dissociates from a complex of subunits or a complete capsid (T)
- The self-assembly process of a virus only proceeds in one direction, so that both correctly and incorrectly bound subunits will remain after association (F)

Differential stability

- One of the driving forces behind self-assembly is that the stability is higher for multimeric complexes with a higher number of subunits (T)
- It is easier for a subunit to dissociate from an almost complete capsid than from a smaller complex of subunits (F)

Influence of temperature

- At lower temperatures the subunits move slower and collide with less energies (T)
- The stability of the complex increases with an increasing temperature (F)

Error-correction

- If a subunit binds to a complex in an incorrect way it will more easily detach than if it binds in a correct way, which leads to the process being ‘self-correcting’ (T)
- Since incorrect complexes are more stable than correct complexes, the incorrect complexes will remain (F)