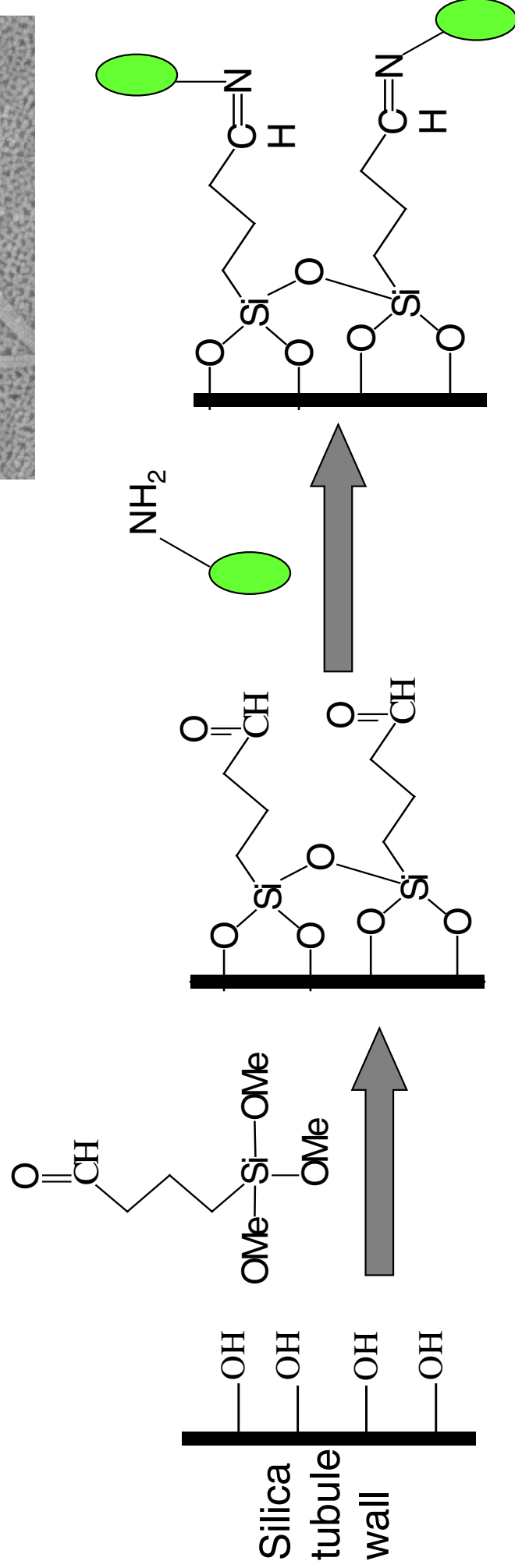
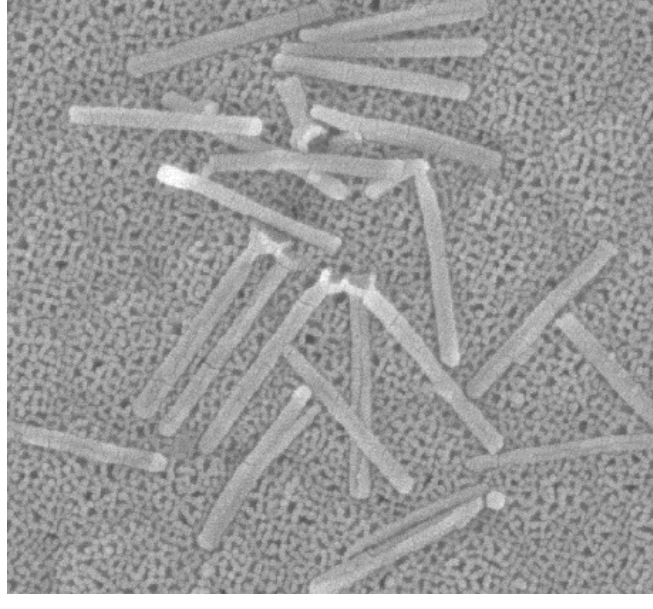
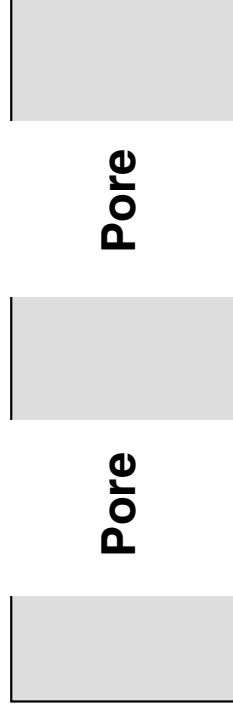


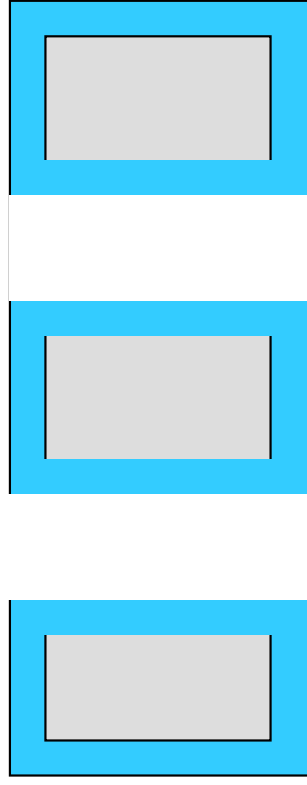
1. Functionalize tubule wall with an aldehyde-terminated silane.
2. Couple the antibody to the aldehyde through primary amino sites on the antibody.



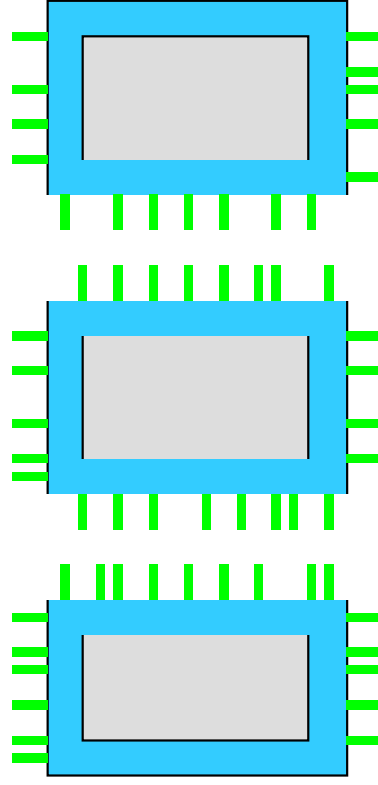
A. Cross-section of Al_2O_3 template membrane showing two pores.



B. Sol-gel synthesis of SiO_2 nanotubes.

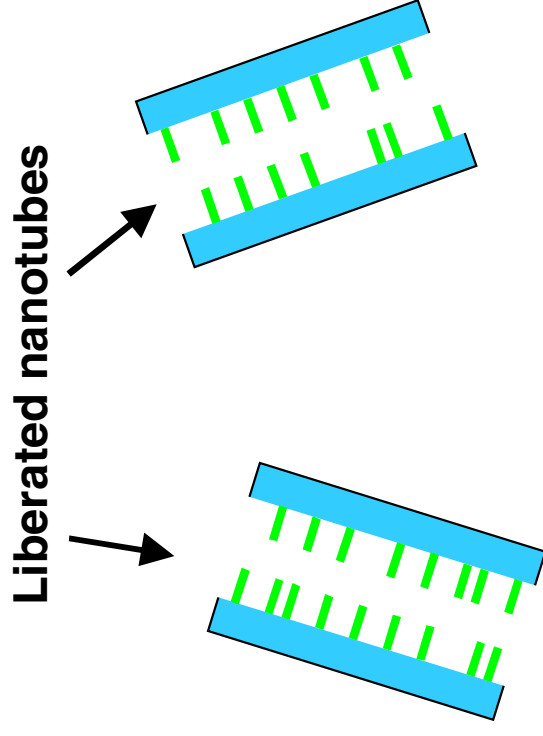


C. Attach first silane to inner tube surfaces*.



* Attach silane to inner tube surfaces

D. Remove surface films on faces of membrane and dissolve template membrane.



E. Attach second silane to outer surfaces.

