

Quiz: Lecture 2.6
Principles of Electronic Nanobiosensors
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Answer the **five questions** below by choosing the **one, best answer**.

- 1) The droplet-based biosensors beat the diffusion limit by
 - a) Reducing the size of the diffusion 'box'.
 - b) Increasing the diffusion coefficient of the biomolecules.
 - c) Increasing the density of water.
 - d) None of the above.

- 2) The size of the droplet must be small, so that
 - a) It matches the size of the nanobiosensor.
 - b) The droplet can move easily over the sensor surface.
 - c) One can work with small analyte volume.
 - d) The evaporation is faster than the diffusion of biomolecules.

- 3) In the scheme discussed, the microstructured pillars have multiple functions. These include
 - a) Creating the hydrophobic surface.
 - b) Serving as electrodes for impedance measurement.
 - c) Potentially work as heaters to ensure fast evaporation of larger droplets.
 - d) All of the above.

- 4) The radius of a spherical droplet reduces from 500 μm to 5 μm in 30 minutes. If the initial analyte concentration was 1 fM, what is the concentration at the end of the evaporation process?
 - a) 1 mM.
 - b) 1 μM .
 - c) 1 nM.
 - d) 1 pM.

5) Etching pillars within the hydrophilic surface increases its hydrophobicity. This is because

- a) The integrated solid-liquid interaction is weakened.
- b) The integrated solid-vapor interaction is weakened.
- c) The integrated liquid-vapor interaction is reduced.
- d) None of the above.