Quiz: Lecture 2.4
Principles of Electronic Nanobiosensors
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Answer the **five questions** below by choosing the **one, best answer**.

1) What is the fractal dimension (D_F) of an array sensor?

a) 1
b) 2
c) A fixed number between 1 and 2.
d) None of the above.

2) Which of the following statements is true for an array sensor?

a) The array sensor behaves like a collection of NW sensors in the beginning, but a planar sensor when the diffusion front moves away from the sensor.
b) The array sensor behaves like a planar sensor in the beginning, but then as a collection of NW sensors when the diffusion front moves away from the sensor.
c) The fractal dimension perceived by the biomolecules is independent of time.
d) At low analyte concentrations, the time-dependent diffusion fronts can be obtained by tracking molecules associated with a single sensor.

3) Array sensors provide significant advantage

a) At all analyte concentrations.
b) At relatively high analyte concentrations.
c) At very low analyte densities.
d) Sometimes at high densities, sometimes at low densities, depending on the spacing between the array elements.

4) For a nanonet (nanocomposite) sensor, the repeated back-and-forth between 1D diffusion and 2D diffusion cannot be observed in practice because

a) We do not have equipment to resolve the response characteristics in detail.
b) The problem is difficult to solve mathematically; the lack of numerical precision will prevent accurate description of the diffusion fronts.
c) The knees will be washed out, because the original surface is described by a random fractal, not a regular fractal.
d) The concept of diffusion does not apply when the analyte density is very low.

5) If the D_F=1.54 for a nanonet sensor, what would the time-exponent of analyte capture?

a) 1.54
b) 0.73
c) 1.46
d) 1.07