Quiz 5 (Lecture 07 QBIO482)

Date: 4/8 (Make-Up)
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Purely unbiased diffusion is rare in biological systems. What are the factors that can influence or shape the spatial and temporal behavior of molecules or cells during their movement? List two factors. [0.1 pt]

1. Chemical gradients: Cells or molecules often move directionally in response to concentration gradients of signaling chemicals, leading to biased movement toward/away from certain regions.
2. Physical barriers or structures: Tissue architecture, extracellular matrix, or cellular obstacles can constrain/guide movement, altering diffusion paths and speeds.

Of the two factors you listed above, which one introduces a bias due to thermodynamic equilibrium? Briefly explain how it affects diffusion. [0.1 pt]

Chemical gradients introduce a bias, as they correspond to differences in chemical potential. Molecules naturally move from regions of high to low chemical potential to reach thermodynamic equilibrium. This introduces a directional bias in diffusion, favoring movement down the gradient.