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Spatiotemporally Controlled Molecular Imaging

Detection of targets (e.g., metal ions) in cells and animals is highly important to get insights into its physiological and pathological roles. Conventional sensors have limitations in obtaining imaging signals with high spatiotemporal selectivity because of the "always active" design. Moreover, a significant limitation of current sensors is that they generally lack cell-type selectivity. Cell-selective biosensing is still a challenge because of the lack of a design methodology. To address this unmet need, we focused on the design of DNA nanosensors that allows for biosensing and imaging with precise spatial and temporal control. The sensor is constructed by engineering of the functional DNA molecules with a responsive element and further introduction of nanotechnology. The spatiotemporally controlled sensing strategy is of significant importance to monitor dynamic biochemical processes.

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