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Detection and drug targeting of both PSMA (+) and PSMA (-) prostate cancer cells using a RNA/peptide dual-aptamer conjugate

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Prostate cancer is the second most common cancer in men, and for this reason, its early diagnosis and proper treatment have been a matter of great concern. Prostate cancer has two types of cell lines based on the expression of the PSMA (prostate specific membrane antigen): PSMA (+) and PSMA (-) cell lines. Researches on PSMA (+) prostate cancer have been highly reported for its importance in diagnosis and drug targeting; however, treatments for PSMA (-) cell lines have been scarcely investigated compared to that of PSMA (+) cells. Furthermore, the simultaneous detection of both cell types has not been reported yet. Based on this need to develop new techniques for types of prostate cancer involving the PSMA (-) cell line, we constructed a simple and direct impedance sensor to detect prostate cancer cells using its specific two aptamers; an anti-PSMA RNA aptamer[4] (A10,GG GAGGACGAUGCGGAUCAGCCAUGUUUACGUCACUCCUUGUCAAUCCUCAUCGGC, underlined nucleotide represents the modified pyrimidins of 2'-F UTP and 2'-F CTP) for PSMA (+) cell line and a DUP-1 peptide aptamer[5] (FRPNRAQDYNTN) for PSMA (-) cell line. And also differential pulse voltammetry (DPV) method was used to confirm the effect of an anticancer drug, especially doxorubicin, which would be selectively delivered to prostate cancer cells using these aptamers.

Biography

Ban has completed his Ph.D from the Ohio State University and postdoctoral studies from NIH. He has published more than 50 papers in reputed journals and serving as an editorial board members of *Sensors* and *Journal of Korean Chemical Society.*

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