ABSTRACT 03

Proteomic Profiling of Membrane Proteins Via Lc-Ms/Ms Identifies Cd147 As A Key Biomarker In Bladder Cancer Cells

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Objectives: Bladder cancer (BC) recurrence is one of the primary clinical problems encountered by patients following chemotherapy. However, the mechanisms underlying their resistance to chemotherapy remain unclear. This recurrence outcome is thought to be associated with an alteration in the pattern of membrane proteins (MPs), which often leads to cell dysfunction. Therefore, the present study aimed to identify the highly expressed potential MPs in the BC using a proteomic approach ***Methods:*** We extracted MPs from four different stages of BC cell lines (RT 112-non-invasive, 5637-grade-2 invasive, J82-grade-3 invasive, and UM-UC-13-metastasis bladder cancer cells) using the Mem-PERTM Plus Membrane Protein Extraction Kit. The isolated MPs were digested into peptides and identified by a global proteomics approach using LC-MS/MS, followed by peptide selection. These analyses revealed the presence of over 20 MPs in each BC cell line, and the initial screening identified over 1000 total peptides. We further analysed the protein localisation of the identified protein using the transmembrane domain prediction algorithms (TMpred and TMHMM v. 2.0) and the UniProt database. ***Results:*** Our finding revealed that CD147 and caveolin-1 are among the membrane proteins that were highly expressed in bladder cancer cells. CD147 was detected on the cell membrane by immunocytochemistry, while caveolin-1 showed a positive signal without clear staining on the membrane, suggesting that MP exists in multilocation. Validation by Western blot analysis revealed that CD147 was significantly reduced in invasive grade-2 (5637) and invasive grade-3 (J82) compared to non-invasive (RT 112). In contrast, CD147 expression increased significantly in metastasis (UM-UC-13) compared to invasive grade-2 (5637) and invasive grade-3 (J82) bladder cancer cells, suggesting its potential as an MP biomarker for both cancer subtypes. ***Conclusion:*** These findings suggest that MPs, particularly CD147, could serve as key biomarkers for bladder cancer and may be promising targets for enhancing drug sensitivity in BC treatment strategies.

Keywords: Bladder cancer, CD147, membrane protein, proteomic analysis, LC-MS/MS

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