

ORIGINAL ARTICLE

Increased Expression of ProBDNF/Sortilin in Localized Prostate Cancer Tissues Compared to Adjacent Non-Cancerous Tissues

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SUMMARY

Background: The unprocessed precursor of brain-derived neurotrophic factor (BDNF), proBDNF, has emerged as a potential determinant of therapeutic response in prostate cancer. Upon secretion, proBDNF preferentially binds to the co-receptors sortilin and p75NTR, triggering pro-apoptotic or pro-survival cascades, depending on cellular context. ProBDNF engages sortilin/p75NTR to drive castration resistance and metastasis in prostate cancer. High proBDNF/sortilin predicts poor therapy outcome, yet their tissue expression in prostate cancer (PCa) remains unclear.

Methods: To evaluate the protein expression levels of proBDNF, sortilin, and p75NTR, we performed immunohistochemical analyses on 18 formalin-fixed paraffin-embedded (FFPE) PCa tissues obtained at radical prostatectomy between 2024 and 2025, together with matched para-carcinoma tissues.

Results: Compared with para-carcinoma tissues, immunohistochemistry in 18 paired specimens showed that proBDNF was significantly upregulated in PCa tissues (median IHC score 60.5 (range 57 - 65) vs. 41.5 (40 - 45), $p < 0.05$). Sortilin expression was also higher in PCa (median 37.0 (35 - 39) vs. 16.5 (15 - 18), $p < 0.01$); P75 expression remained relatively low in both prostate cancer and adjacent non-cancerous tissues (18.5 (17 - 20) vs. 6.5 (5 - 8), $p < 0.05$).

Conclusions: These findings suggest a correlation between the expression levels of proBDNF, sortilin, and p75NTR and the characteristics of PCa. Further investigation into the mechanisms underlying these interactions may provide valuable insights for the development of targeted therapies for PCa.

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Supplementary Data

Table S1. H-score quantification results.

Marker	Median H-score	Interquartile range	Scope	High expression (H-score \geq 100)
pro-BDNF	185	160 - 210	80 - 270	15/18 (83%)
Sortilin	140	110 - 175	50 - 220	12/18 (67%)
p75NTR	30	10 - 45	0 - 80	2/18 (11%)

H-score quantification results are presented in Supplementary Table S1. We re-analyzed the immunohistochemical slides from 18 prostate cancer specimens and graded expression using the H-score system (range 0 - 300). The median H-scores were 185 (IQR 160 - 210) for pro-BDNF, 140 (IQR 110 - 175) for sortilin, and only 30 (IQR 10 - 45) for p75NTR.