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Cloning and functional identification of a novel *BCA3* splice

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ABSTRACT. The human breast cancer-associated gene (*BCA3*) was first discovered in breast and prostate cancer cells lines. *In vivo* studies have shown that BCA3 is mainly expressed in breast tumor cells and not in normal breast and prostate tissues. To date, 3 splice variants of *BCA3* have been reported: a double-absent variant lacking exon 3 and exon 5 (*BCA3-1*), an exon 3-absent variant (*BCA3-2*), and full-length *BCA3*. In this study, we investigated whether a novel *BCA3* splice variant exists that lacks only the exon 5-encoding sequence. *BCA3* variant splices were subcloned and sequenced using reverse transcription-polymerase chain reaction. The preliminary biological functions of the splices were identified using confocal microscopy and a luciferase assay. The absence of exon 3 and exon 5 influenced the subcellular localization of BCA3 and nuclear factor kappa B (NF-kB)-dependent gene expression. Exon 3 and exon 5 of *BCA3* may function together to provide a nuclear localization signal or transport sequence to enter the nucleus, and exon 3 may contain specific sequence(s) or domain(s) that influence the NF-κB signal cascade. The discovery of

novel *BCA3* splicing indicates a new cancer research area, which may increase the understanding of cancer generation and development.

Key words: *BCA3*; Splice; Nuclear retention; NF-κB

