Loss of heterozygosity (1/5) and tumor suppressor activity of Bin1 (2/3) in prostate (1) carcinoma (5). The genetic events underlying the development of prostate cancer are poorly defined. c-Myc (2/3) is often activated in tumors that have progressed to metastatic (5) status, so events that promote this process may be important. Bin1 is a nucleocytoplasmic (1) adaptor protein with features of a tumor suppressor that was identified through its ability to interact with and inhibit malignant transformation (6) by c-Myc. We investigated a role for Bin1 loss or inactivation in prostate cancer because the human (7) Bin1 gene is located at chromosome 2q14 (1) within a region that is frequently deleted in metastatic prostate cancer but where no tumor suppressor candidate has been located. A novel polymorphic microsatellite (1) marker located within intron 5 (1) of the human Bin1 gene was used to demonstrate loss of heterozygosity (1/5) and coding alteration (6) in 40% of informative cases of prostate neoplasia (5) examined. RNA and immunohistochemical analyses (10) indicated that Bin1 was expressed in most primary tumors (5), even at slightly elevated levels relative to benign tissues (1), but that it was frequently missing or inactivated by aberrant splicing (6) in metastatic tumors (5) and androgen-independent tumor cell lines (1). Ectopic expression (10) of Bin1 suppressed the growth of prostate cancer lines (10) in vitro. Our findings support the candidacy of Bin1 as the chromosome 2q (1) prostate tumor suppressor gene.