

Abstract: Prostate cancer bone metastases are associated with a poor prognosis and are considered incurable. Insight into the formation and growth of prostate cancer bone metastasis is required for development of new imaging and therapeutic strategies to combat this devastating disease. Animal models are indispensable in investigating cancer pathogenesis and evaluating therapeutics. Multiple animal models of prostate cancer bone metastasis have been developed, but few effectively model prostatic neoplasms and osteoblastic bone metastases as they occur in men. This review discusses the animal models that have been developed to investigate prostate cancer bone metastasis, with a focus on canine models and also includes human xenograft and rodent models. Adult dogs spontaneously develop benign prostatic hyperplasia and prostate cancer with osteoblastic bone metastases. Large animal models, such as dogs, are needed to develop new molecular imaging tools and effective focal intraprostatic therapy. None of the available models fully reflect the metastatic disease seen in men, although the various models have provided important insight into the metastatic process. As additional models are developed and knowledge from the different models is combined, the molecular mechanisms of prostate cancer bone metastasis can be deciphered and targeted for development of novel therapies and molecular diagnostic imaging.