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Practical guidelines for the successful implementation of a rat model of prostate cancer chemically and hormonally induced


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Abstract

Prostate cancer is a very common cancer in men, affecting approximately 1.4 million men worldwide in 2020. To improve the quality of life and survival of both animals and humans, effective therapeutic approaches have been developed and evaluated using animal models. The rat model of prostate cancer induced by a multistep protocol that consists of a sequential administration of flutamide, followed by testosterone propionate, then administration of N-methyl-N-nitrosourea, and finally subcutaneous implantation of tubes filled with crystalline testosterone, is one of the most frequently used for prostate cancer research. However, the lack of standardization in procedures for prostate cancer induction, sample collection, and analysis represents a challenge for researchers. To address this issue, we aim to provide investigators with a detailed, step-by-step guide to implementing a rat model of prostate cancer, based on our extensive experience in this field. First, we briefly review the prostate cancer-induced protocols found in the literature, then we detailed the prostate cancer rat

model implemented by our team. After, we explored the rats' prostate monitoring during the experiment protocol through imaging modalities, namely ultrasonography, computed tomography, and magnetic resonance imaging. We described animal welfare monitoring based on a table of humane endpoints, as well as data collection, such as biological variables and prostate samples. In sum, this article will ensure the quality of results and enable their comparison among different researchers using this rat model.

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