

ABSTRACT

Establishment of SHON Gene Knockout Breast Cancer Cell Line using CRISPR-Cas9 Technology

Alyssa Clemas

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Anthracycline-based chemotherapy is important for the clinical treatment of triple-negative breast cancer (TNBC) and is currently considered the gold standard of treatment. Expression of Secreted hominoid-specific oncogene (SHON) has been able to predict response to anthracycline-based combination chemotherapy in patients with TNBC but the mechanism of action of SHON in TNBC remains largely unclear. The purpose of this research was to gain a better understanding of the SHON gene mechanism and its correlation to TNBC. As well as also investigating the effects of deleting this oncogenic gene in MDA-MB-231 TNBC cell lines. In the present study, SHON knockout cell model was established by using clustered regularly interspaced palindromic repeats (CRISPR)-CRISPR-associated protein 9 (Cas9) system in MDA-MB-231 TNBC cell line. In this presentation, I plan to show initial results generated via a colony formation assay and ultimately show the difference between breast cancer cells with the oncogenic SHON gene present and breast cancer cells without the oncogenic SHON gene. A colony formation assay is a common in vitro cell survival assay and is measured based on the ability of a single cell to grow a colony, and thus, can be used to compare cancer cell growth rates. In the study, the assay itself was repeated in duplicate and revealed that there were significant differences between the two different cell lines. Results showed that in the breast cancer cell lines with the oncogenic SHON gene present, significantly more cancer cell colonies were produced, which were not only more frequent in number but also much larger in size, in contrast to the breast cancer cell lines without the SHON gene present. This initial experiment demonstrates that while the mechanism of the gene itself is quite limited, the SHON gene does play a big role in the development and formation of triple negative breast cancer.