Method for culturing patient-derived cancer cells expedites treatment decisions for bladder cancer

Technology #cu14280

Bladder cancer is a prominent type of cancer that typically affects the superficial portion of the bladder. The current treatment approach includes surgical removal of the tumor, followed by chemotherapy or immunotherapy to reduce the progression or reoccurrence of the cancer. There is variability in the effectiveness of this treatment such that occasionally, the cancer persists and the bladder must be completely removed. The risk of disease progression is correlative with how long a diseased bladder remains in the body, so early detection of chemotherapy failure is paramount. This technology describes a protocol to culture cancer cells at a high efficiency from a small tissue sample taken from a biopsy. These cancer cell cultures can be used to identify patients who would respond unfavorably to chemotherapy at an earlier stage in the treatment process. This technology could help doctors and clinicians provide a more timely decision on the appropriate course of action to treat individual bladder cancer cases.

High efficiency and specificity of cancer cell lines contribute to chemotherapy efficacy testing

Current cell culture lines and models for bladder cancer either take too long for prognostic use or are not specific to patient treatments. Studies that establish cell culture lines using human bladder tumors generally require large amounts of tissue samples, have suboptimal efficacy rates of 31-78%, and have short survival times. Other prognostic assays for cancer biopsy samples use established cell lines that are not representative of all patients. Also, cancer response to chemotherapy is generally tested intravenously, which differs from the intravesical chemotherapy used for bladder cancer. Thus, these tests are not ideal models for chemotherapy efficacy against individual bladder cancer cases. This technology provides a protocol that only requires a small tissue sample to grow patient-derived cancer cells in culture. This cancer cell culture has a high (89%) efficiency and extended survival time in vitro to produce rapid and repeatable prognostic results from chemotherapy treatments. The specificity of these cancer cell lines to the patients may aid physicians in designing a more effective plan to treat the patient’s cancer. Moreover, these cancer cell lines can be frozen for long-term storage, which could contribute to studying the pathophysiology and future treatments for bladder cancer.
Human bladder tumor specimens were obtained from patients and cell lines were derived from these samples, proliferating rapidly enough to perform efficiency testing against intravesical therapeutics in about 2 weeks.

**Lead Inventor:**

Michael M. Shen, Ph.D.

**Applications:**

- Modeling the efficacy of intravesical therapy agents to determine course of action in treating bladder cancer patients
- Use for drug therapy development to treat bladder cancer
- Use for pathophysiology studies of bladder cancer
- Modeling diseases related to unregulated cell growth
- Creation of a tissue library of cancerous tissue for research purposes (bladder cancer or otherwise)

**Advantages:**

- Ability to establish a cell line from only a small tumor sample
- High efficiency rate (89%) with rapid cell growth timeframe
- Cell lines can remain in culture for an extended period of time
- Cell lines can be frozen for long-term storage and thawed at a later date with normal growth
- Patient-derived cell lines would be specific to each bladder cancer case for personalized therapy

**Patent information:**

Patent Pending

Tech Ventures Reference: IR CU14280

**Related Publications:**


**Inventors**

Michael Shen Ph.D.