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[www.roswellpark.org/commercialization](http://www.roswellpark.org/commercialization)**A Novel Method for Delivery and Use of Isothiocyanates for Combating Bladder Cancer**

Ref# RP09-022

**Keywords:** Bladder cancer, transitional cell carcinoma, cystectomy, cisplatin, carboplatin, isothiocyanate (ITC), allyl isothiocyanate (AITC), mustard seed powder, sulforaphane (SF), broccoli seed powder.

**Collaboration Research Opportunity:** Roswell Park Cancer Institute is seeking partners to help co-develop the use of isothiocyanates to manage and treat the recurrence of superficial bladder cancer.

**Background:** Bladder cancer is the 4<sup>th</sup> most common malignancy in men and 8<sup>th</sup> most common in women. The majority of bladder cancers are detected as superficial without muscle invasion and are treated with transurethral resection. However the rate of recurrence is ~80%. Currently, patients who are at high risk are treated after surgery by immunotherapy, attenuated BCG, or chemotherapy. These therapies not only mandate transurethral delivery in order to prevent systemic toxic effects, but also have limited efficacy and significant local adverse effects. Thus, there is an ongoing unmet medical need for methods for bladder cancer therapy and prophylaxis, particularly for recurring bladder cancer.

**Technology:** Purified isothiocyanates (ITCs) such as allyl isothiocyanate (AITC) and sulforaphane (SF) found in such vegetable products as broccoli, broccoli sprouts, mustard seed powder, horseradish, and wasabi powder allow for a unique method of targeting and delivering an active drug specifically into the bladder for use as an anticancer agent in fighting bladder cancer recurrence and invasion. Oral administration of these products leads to a significant accumulation of the active drug selectively in the urinary bladder where it targets the cancer cells while sparing the normal bladder epithelium. This activity is seen at a relatively low dose (~1mg/kg/day x 21) in preclinical studies, making it feasible for long term administration in humans without causing adverse effects.

**Potential Commercial Applications:**

- Active treatment for bladder cancer
- Inhibition of bladder cancer growth
- Preventing bladder muscle invasion and metastasis
- Preventing recurrence of superficial bladder cancer recurrence

**Competitive Advantages:**

- Selective targeting of malignant cells while sparing of normal cells
- Low dose activity makes it feasible for long term administration without adverse side effects
- Selective intravesical delivery of anticancer agents after oral administration
- A simple method for monitoring urinary concentrations of the anticancer agents has been developed
- A novel approach for inhibition of superficial bladder cancer recurrence
- Potential reduction in cancer invasion makes it more attractive anticancer agent of choice

**Development Status:** Patent Status: US 6,534,040; Filed in Australia, Belgium, Canada, Europe, Japan

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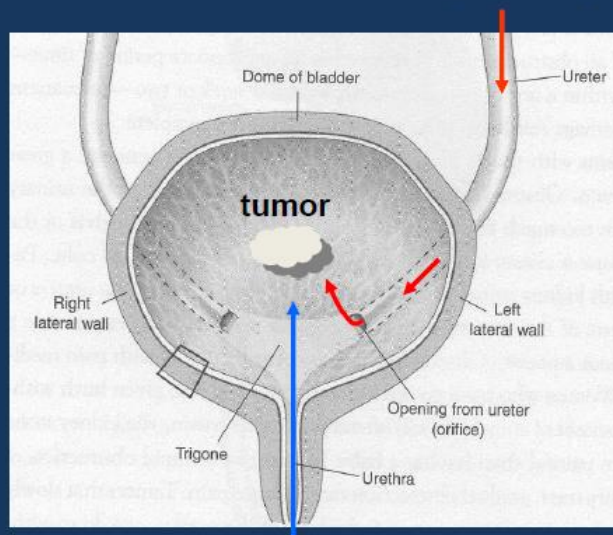
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**Illustration:**

**Our Strategy for Bladder Cancer Prevention/Treatment:**

**To Develop oral agents that can be delivered to bladder intravesically through urinary excretion**



**Intravesical Therapy Is not New**

- **Immunotherapy with BCG**
- **Chemotherapy**