

## Individualized Cancer Therapy that Suppresses Tumor Progression & Metastasis

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**Keywords:** Vaccines, cancer, immunotherapy, nanoparticles, RNAi, miRNA

### Summary:

The National Cancer Institute (NCI), [Laboratory of Cancer Biology and Genetics](#) seeks parties interested in collaborative research to co-develop RNAi viral particles, nanoparticles, and miRNA for cancer therapy.

### Technology:

Scientists at the NIH have developed a method of suppressing tumor progression and metastasis by targeting a pathway. This novel treatment method is an individualized therapy that first screens patients to determine if they are a candidate for the treatment and then utilizes their own altered bone marrow to inhibit tumor progression.

Tumor inhibition is achieved through decreased expression of TGF-beta receptor II (TGFβ r2) in bone marrow derived myeloid cells, which is essential in tumor metastasis. The inventors have devised a patient selection method whereby the patient's blood is drawn and screened for TGFβ r2 expression, and those patients with greater than normal expression are selected as candidates for treatment. After candidate screening, the patient's bone marrow is harvested and divided into two parts: one part for cell culture and the other for storage and use. The patient's cell culture bone marrow is treated to remove TGFβ r2 in myeloid cells through viral or non-viral particles, or nanoparticles. The patient is treated with total body radiation and then receives an infusion of the treated cell culture bone marrow. After tumor metastasis is suppressed, the altered bone marrow is removed, and the stored bone marrow is returned to the patient.

### Potential Commercial Applications:

- Novel immunotherapy for cancer that suppresses tumor metastasis in patients overexpressing TGFβ r2 in myeloid cells;
- TGFβ r2 RNAi with specific myeloid cell promoters delivered by viral or non-viral particles, or nanoparticles.

### Competitive Advantages:

- Treatment utilizes patient's cells, so gives individualized therapy;
- Ability to specifically target myeloid cells and not other host cells;
- Patient selection process; treatment is specific to eligible patients reducing cost.

**Development Stage:** Pre-clinical, *in vitro* animal data available.

**Patent Status:** U.S. Patent Application No. 61/525,025 filed 18 August 2011.

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