COMPOSITIONS AND METHODS OF TARGETING CANCER STEM CELLS

Summary

A pharmaceutical composition and method to detect and treat cancer stem cells (CSCs). CSCs are resistant to conventional cancer therapy and are linked to metastasis and tumor relapse. The invention includes three different peptoid compounds, PCS1, PCS2, and PCS3, which are capable of selectively identifying, targeting, and isolating CSCs. Additionally, the dimer of PCS2 is capable of inhibiting CSC growth and can be developed as a CSC therapeutic. PCS1, PCS2, and PCS3 target CSCs by interacting with specific biomarkers. The lead molecule has been tested in vitro colony formation, migration, and invasion assays.

Competitive Advantages

- Specifically targets CSCs and does not interact with non-stem cell cancer cells
- Advantageous properties such as high serum stability, cell permeability and non-immunogenicity
- Affordable and simple to synthesize

Problem Addressed

- Developing a CSC-specific therapy to eliminate CSCs, which are not eliminated in conventional cancer treatments
- Detecting and isolating drug-resistant and tumorigenic CSCs
- Identifying biomarkers of the poorly understood CSC for future pharmaceutical research and development

Applications

- CSC-specific therapy for various cancers
- CSC identification and isolation
- Drug development targeting CSC biomarker Plectin
- Circulating tumor cell identification and diagnosis

Patents

- PCT/US2017/052184
- US 62/396274

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Meet the Inventor

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Research Interests:

- Peptoids and peptidomimetics
- Combinatorial chemistry and novel on-bead cell screen technology developments
- Cancer therapy-diagnostic tool development
- Cancer stem cell biomarker identification and treatment
- Early biomarkers for cancer - identification and treatment