Therapeutic Compounds for Prostate Cancer Treatment

Potent histone deacetylase (HDAC) inhibitors that can be used to treat or prevent prostate tumors

Georgia Tech inventors have developed potent histone deacetylase (HDAC) inhibitors that can be used to treat or prevent prostate tumors. These compounds are highly selective for prostate malignancies and may be used for both hormone-sensitive and hormone-refractory tumors. HDAC inhibition has been validated as a clinically viable cancer therapy; however, one of the major drawbacks is a lack of selectivity, resulting in toxicity and low potency. Building upon structural similarities between the aryl recognition cap-group of HDAC inhibitors and diarylhydantoin anti-androgens, the inventors have provided arylhydantoin-derived HDAC inhibitors with improved selectivity for prostate malignancies.

Summary Bullets

- **Prostate specific**: This technology is a targeted approach for androgen receptor malignancies.
- **More effective**: It offers a new treatment for tumors that have progressed to the hormone refractory stage.
- **Less toxic**: Compounds are highly selective for targeted receptors.

Solution Advantages

- **Prostate specific**: This technology is a targeted approach for androgen receptor malignancies.
- **More effective**: It offers a new treatment for tumors that have progressed to the hormone refractory stage.
- **Less toxic**: Compounds are highly selective for targeted receptors.

Potential Commercial Applications

- Treatment for prostate cancer in salt, prodrug, or solvate formulations

Background and More Information

Prostate cancer is a leading cause of death in males worldwide. Treatment options for early-stage prostate cancer involve various combinations of monitoring, surgery, radiation, chemotherapy, or hormone therapy, including androgen-deprivation therapy (ADT). Prostate cancer growth is dependent upon androgenic hormones, such as testosterone or dihydrotestosterone, binding to the androgen receptor and localizing it to the cell nucleus where it upregulates the transcription of critical genes. ADT works either by administering an antagonist to block the

androgen receptors or by castration to reduce the amount of testosterone available. However, most hormone-dependent cancers become resistant to treatment after a few years, and the disease often progresses to the much more lethal form—that is, hormone-refractory prostate cancers. Much research has been dedicated to identifying methods of inhibiting androgen-receptor expression to delay the progression—and to treat—hormone-refractory prostate cancers.

Inventors

- Dr. Adegboyega Oyelere
  Associate Professor - Georgia Tech School of Chemistry and Biochemistry
- Dr. Berkley Gryder
  Postdoctoral Research Fellow at National Cancer Institute (NCI)

IP Status

Patent has issued : US9139565

Publications

Antiandrogen-Equipped Histone Deacetylase Inhibitors Selectively Inhibit Androgen Receptor (AR) and AR-Splice Variant (AR-SV) in Castration-Resistant Prostate Cancer (CRPC), Cancers - March 15, 2023

Images

Visit the Technology here:
Therapeutic Compounds for Prostate Cancer Treatment