Unique Class of Cyanooxime Carbonyl Reductase Inhibitors (CyanOx-CRIs) to Lower Cardiotoxicity of Anthracycline Agents

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Abstract

Anthracyclines are a family of effective anti-neoplastic agents used to treat cancer, including leukemia, soft tissue sarcomas, and breast and lung cancer. While they are potent anti-tumor drugs, their use is limited by potentially life-threatening cumulative dose-dependent cardiotoxicity, which can ultimately result in congestive heart failure. Several studies have implicated carbonyl reductase (CR) enzymes as the cause of cardiotoxicity, as well as the development of drug resistance. We present a unique class of Cyanooxime Carbonyl Reductase Inhibitors (CyanOxCRIs) that may lower the dosage of anthracyclines needed and the cardiotoxic side effects in cancer treatment. CyanOx-CRIs are designed to prevent conversion of anthracycline to metabolites. This has the direct effect of maintaining drug concentrations and cancer cell-killing action. This also has the indirect effect of lowering formation and build-up of the metabolites believed to disrupt heart muscle processes and heart function.

Advantages

- Increases the efficacy of anthracycline therapy in cancer treatments.
- Reduces the amount of carbonyl reductase created, reducing the negative effects on the heart.
- Uses the FDA approved drug anthracycline to reduce the effect of carbonyl reductase.
- Results in healthier cancer patients after treatment due to the reduced amount of metabolites causing cardiotoxicity.

Stage of Development

This technology is developed and a patent has issued.

Boise State is looking for a Licensee for this technology.

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