Triclosan: a First-of-its-Kind Biphenyl Compound to Increase the Efficacy of Anthracycline Anti-cancer Agents

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Abstract

Anthracyclines are the most commonly used chemotherapy agents for cancer, including leukemia, soft tissue sarcomas, and breast and lung cancer. However, in the body, an enzyme called carbonyl reductase causes anthracycline to be converted into metabolites – which not only lowers the amount of cancer cells killed by a given dose, but also contributes to cardiotoxicity and drug resistance. We present the first biphenyl compound shown to significantly inhibit carbonyl reductase: Triclosan. Triclosan is an uncompetitive inhibitor against carbonyl-containing substrates (like anthracyclines). This results in lower doses of the anthracycline drugs that will be effective for cancer cell-killing.

Boise State University has developed a composition that reduces the negative permanent side effects of the chemotherapy drug anthracycline. It is anticipated that Triclosan may be administered along with anthracyclines as a cotherapy; or even pretreatment to block carbonyl reductase before administration. Most intriguing is the potential of triclosan in combination with one or more anthracycline compounds. This makes it attractive to companies developing improved formulations of adriamycin, daunomycin, daunorubicin, doxorubicin, epirubicin, and idarubicin.

Advantages

- Increases the efficacy of anthracycline therapy in cancer treatments.
- Reduces the cost of treating cancer patients due to more effective drugs used.
- Results in healthier cancer patients after treatment due to the reduced amount of metabolites causing cardiotoxicity.

Boise State is looking for a Licensee for this technology.

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