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Halocombstatins

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Invention Description

The Combretastatins, discovered by ASU researchers, are a series of very potent antineoplastic compounds. Combretastatin A-4 (CA4), the most potent compound of the family, is currently undergoing phase III human cancer clinical trials.

ASU researchers have conducted extended SAR on Combretastatins. They eventually synthesized structural analogs of Combretastatins A-4, A-3 and their phosphate prodrugs by replacing their C-3 and/or C-5 substituents with halogens (F, Cl, Br and I). These new compounds, named Halocombstatins, retained the powerful human cancer cell lines inhibitory activity of CA4. Fluorcombstatin showed particular potency against human umbilical vein endothelial cells (HUVECs) *in vitro* (ED_{50} 0.00025 μg/ml).

The iodo-structural modifications of CA4P could be particularly interesting as the parent molecule, CA4, has shown good activity in treating human thyroid carcinoma.

Moreover, the new synthesized compounds generally display antimicrobial activity. Some diiodocomstatins are very active against *N. gonorrhoeae*.

Potential Applications

These novel compounds have applications as:

- **Anti-cancer therapeutic agents**
- **Anti-cancer therapeutic agents with increased specificity toward thyroid carcinomas**
- **Anti-microbial therapeutic agents**

Benefits and Advantages

- **Diversity** – Disclosure of a panel of structural modifications of Combretastatins. The new compounds retain the Combretastatin A-4 anti-neoplastic activity. Some of them were more particularly designed for thyroid cancers treatement.
- **Synthesis** – The new compounds are synthetically available.