Specific Protein Tyrosine Phosphatase Inhibitor for Cancer

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Technology description

Overview:

Many protein tyrosine phosphatase (PTPs) are over-expressed in cancers. Often they dephosphorylate and activate the oncogenic protein tyrosine kinase (PTK)c-src, which accounts for 70% of the elevated PTK activity in breast cancer. Thus, PTPs are emerging as important new targets for cancer therapy. Eyes absent (EYA) proteins are members of a regulatory cascade involved in cell-fate determination during normal organ development, that are aberrantly over expressed in several cancer tissues. The EYA proteins (EYA1-4) have dual biochemical functions - they are transactivators and tyrosine phosphatases. The EYA proteins promote cell migration and invasiveness in a phosphatase activity-dependent manner. Inhibition of the EYAs is thus an attractive target for the design of anti-cancer agents.

The design of the PTP inhibitors has been challenging because they share a common reaction mechanism utilizing a conserved Cysteine as well as other features of the active site. The EYA family of PTPs act by a distinct mechanism using an Aspartate as a nucleophile. Hence, they serve as an attractive new target for the design of therapeutic agents.

A number of potential EYA-PTP inhibitors (inhibiting greater than 80% and some of them inhibiting greater than 90%) have been identified, and analogues have been designed. As further work continues to progress the development of this work in the laboratory, we are seeking a collborating partner to further develop it and commercialize it.

Application area

Cancer Therapeutics

Advantages

Specific PTP inhibitor using an Aspartate as a nucleophile instead of cysteine, so minimizes adverse effects.

Targets proliferation and migration so enhances effectiveness.

Institution

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