Cancer Therapeutics Targeting Oncogenic-RAS-Expressing Tumor Cells

Technology #m07-048

"Lead Inventor: Brent Stockwell Ph.D.

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Identification of agents for anti-cancer therapy and drugs selective for tumor cells:
Many anti-cancer drugs currently on the market come with significant side effects for patients because they are often not particularly selective for tumor cells, and can cause unwanted damage or death to normal cells. As a result, molecular targeted cancer therapeutics directed at specific oncogenic proteins or pathways represent a promising approach to cancer drug discovery. However, not all oncogenic proteins can be readily inhibited by a small molecule drug. For instance, the RAS oncoproteins are implicated in numerous human cancers, but have been difficult to target effectively with small molecules. Therefore, a clear need exists to identify oncogene-selective lethal compounds that kill tumor cells only in the presence of specific oncoproteins. Such compounds may target novel proteins in oncoproteins-linked signaling networks.

Identifies agent, which induces oxidative cell death in a tumor cell:
This technology describes methods for identifying an agent, which induces oxidative cell death in a tumor cell. The methods comprise determining the voltage dependent anion channel (VDAC) level in a tumor cell, and determining whether the tumor cell dies via oxidative cell death in the presence of a test agent. Furthermore, this technology provides a class of novel RAS-selective-lethal compounds capable of causing rapid and non-apoptotic cell death in oncogenic-RAS-expressing tumor cells. Methods to treat conditions caused by RAS mutations using compositions containing these compounds are described.

Applications:
• The methods described here can be used to identify potential therapeutic agents inducing oxidative cell death in tumor cells.
• The methods are also useful for determining susceptibility of a tumor cell to an agent, which induces an oxidative cell death. They can be used to identify potential therapeutic targets within the cell.
• The small-molecule compounds provided by this technology can be used to develop new genotype-selective anti-tumor drugs directed at mutant-RAS expressing tumor cells.

Advantages:
• A novel tumor cell killing mechanism targeting the RAS oncogenic pathway, which is involved in a variety of cancers
• Identified compounds are highly selective and extremely potent for oncogenic-RAS-expressing tumor cells
• Minimal in vivo toxicity due to tumor cell specificity and low doses required

Licensing Status: Available for Licensing and Sponsored Research Support
Publications:

Inventors
Brent Stockwell