Targeted cancer cell killing with caspase

Technology #m05-079

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Cancer treatment allows apoptotic pathway to be turned on and off: While proper cellular apoptosis (cell death) is absolutely critical in the prevention of many forms of cancer, control and manipulation of this ubiquitous apoptotic pathway as a developing therapeutic strategy in cancer patients is hampered by leaky, non-specific, and potentially toxic side-effects.

Initiating cell death in cancer cells with controlled caspase generation: This invention offers a tightly controlled method to induce apoptosis in specific cells at a specific time by generating an active caspase (a key apoptotic-inducing protein) only when two separate promoters are each induced. The apoptotic pathway can then be turned off in a similarly specific manner by expression of a caspase-neutralizing protein controlled by a third promoter.

Applications: • Cancer ablation therapy • Research tool o High throughput screening for novel anti-apoptotic cellular proteins or compounds o Generation of animal clones ablated for a specific cell type or tissue o Temporal ablation of specific cells to study their role in development and/or behavior

Advantages: • Provides a general method for the reconstitution of all known caspases o This allows for a broad selectable spectrum of apoptotic pathway targets • High degree of apoptotic specificity in targeting a specific cell type • Tight regulation and expression of apoptotic induction at a specific time point • The three above points together provide a highly accurate, more specific and less "leaky" apoptosis-inducing mechanism

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