A Novel Tumor Targeting Strategy for Cancer Chemotherapy
Tech ID: 24663 / UC Case 2013-091-0

INVENTION NOVELTY
A novel small molecule tumor-activated prodrug technology that produces a therapeutic index multiplying effect, leading to reduced drug-associated toxicity and improved efficacy in cancer patients.

VALUE PROPOSITION
The majority of cancer therapeutics exhibit significant toxicity resulting in undesired side effects for patients and limiting ultimate efficacy to that achievable with a maximally tolerated dose. A promising approach to improve tolerability and efficacy is to mask the inherent toxicity of a chemotherapeutic prior to its release at its intended site of action in tumor. The UCSF technology exploits the tumor microenvironment and changes in tumor iron metabolism induced by oncogenes like Ras and Myc to produce a therapeutic index multiplying effect.

This novel invention provides the following advantages:

▶ Delivery of an approved or novel agent selectively in tumor
▶ Reduced drug-associated toxicity in patients
▶ Therapeutic index multiplying effect allowing much higher doses in patients
▶ An iron-reactive tumor targeting moiety inspired by an antimalarial drug used safely in humans for decades
▶ Excellent potential for developing a companion diagnostic agent

TECHNOLOGY DESCRIPTION
Scientists at the University of California, San Francisco have developed a novel small-molecule tumor-activated prodrug (TAP) technology that exploits oncongenic changes to tumor metabolism. Prevalent oncogenes like Ras and Myc are now known to alter iron homeostasis so as to produce augmented pools of unbound and redox-active ferrous iron. Similarly, tumor-associated macrophages that infiltrate many solid tumors support tumor proliferation in part by releasing iron into the tumor microenvironment. To exploit these changes in tumor metabolism and microenvironment, UCSF researchers have developed a novel TAP platform for more selective delivery of chemotherapeutics. Using this technology, a chemotherapeutic agent can be linked to the iron-reactive moiety to produce a TAP that is essentially non-toxic in normal tissue but that efficiently releases its drug payload in tumor. Selective drug release has been demonstrated in variety of cancer cell lines in vitro and in multiple mouse xenograft cancer models.

LOOKING FOR PARTNERS
To further develop, optimize, and ultimately commercialize this technology by identifying the specific tumor types and patient populations that will most benefit from novel TAPs based on the UCSF technology

APPLICATION
▶ Tumor-activated prodrugs for cancer chemotherapy
▶ Companion diagnostics for patient selection

STAGE OF DEVELOPMENT
Preclinical
RELATED MATERIALS


DATA AVAILABILITY

Cell Line and Xenograft Models

PATENT STATUS

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<td>Issued Patent</td>
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Additional Patent Pending

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Plasma Biomarkers for Monitoring Cancer Chemotherapy Efficacy
- Versatile Labeling of Protein N-Termini for Site-specific Bioconjugation
- Antiviral Compounds for HIV and Other Viral Infections
- Small Molecule Activated Switches for Regulating Cell Therapies Small Molecule
- Covalent Activators Of K2p Channels

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