PIM-Targeted PROTACs

Summary
The National Cancer Institute (NCI) seeks research co-development partners and/or licensees for a series of PIM Kinase targeting PROTACs.

NIH Reference Number
E-094-2022

Product Type
• Therapeutics

Keywords
• PROTACs, PIM kinase-targeting proteolysis-targeting chimeras, PIM, Kinase, Anti-Cancer, Therapy, Solid Tumors, Chemotherapy Resistance, Brognard, Swenson

Collaboration Opportunity
This invention is available for licensing and co-development.

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Description of Technology
Proviral Integration for the Moloney murine leukemia virus (PIM) kinases are overexpressed in many solid cancers – including prostate, breast, colon, endometrial, gastric and pancreatic. High of PIM1 expression is predictive of poor survival in multiple cancer types. While several selective pan-PIM inhibitors were developed and tested in clinical trials, all ultimately increased PIM1-3 protein levels and developed intrinsic resistance.

Researchers at the National Institutes of Health (NIH) developed multiple PIM kinase-targeting proteolysis-targeting chimeras (PROTACs) that lead to PIM1 degradation in a prostate cancer cell model and increased chemo-sensitization. The targeting of PIM kinases for degradation provides superior catalytic inhibition as these compounds target pro-tumorigenic functions of the PIM kinases, which are not linked to kinase activity. Additionally, these PROTACs prevent the onset of resistance due to increased expression of PIM kinases that occur from catalytic inhibition. They represent unique opportunities as
novel anti-cancer therapies. This is a continuation of the PROTAC technologies being
developed by the NIH team of Brognard and Swenson.

The inventors welcome licensing and co-development interests to further develop and
commercialize the technology.

**Potential Commercial Applications**
- A novel anti-cancer therapy to target the PIM kinases
- A PIM targeting PROTACs for the treatments of prostate, breast, and colon cancers,
among others
- A PIM targeting moiety for additional targeted therapeutics

**Competitive Advantages**
- Compound target pro-tumorigenic functions of the PIM kinases that are not linked to
  kinase activity
- Prevention of the onset of resistance due to increased expression of PIM kinases that
  occurs from catalytic inhibition
- Increased chemo-sensitivity
- Compared to small molecule inhibitors, PROTACs:
  - show promise overcoming tumor resistance
  - address and degrade undruggable targets
  - offer novel, rapid and reversible chemical knockout capabilities

**Inventor(s)**
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**Development Stage**
- Pre-clinical (in vivo)

**Patent Status**
- **U.S. Provisional:** U.S. Provisional Patent Application Number 63/341,757, Filed 13 May
  2022

**Related Technologies**
- E-163-2020
- E-169-2021

**Therapeutic Area**
- Cancer/Neoplasm

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