New photosensitizers to block tumor growth by photodynamic therapy

KEYWORDS

- Photodynamic therapy
- Photosensitizer
- Hypoxia
- Cancer

Technology market

Hemera Therapeutics is a consortium of academic researchers (UCLouvain, Belgium) who have identified a new family of photosensitizers with unique properties that circumvent the low activity of photodynamic therapy in hypoxic environment. This makes them excellent candidates for novel cancer therapies.

Photodynamic therapy of cancer consists in the use of compounds called photosensitizers that induce the inhibition of tumor growth when activated by light. Photosensitizers rely on molecular oxygen for the formation of singlet oxygen to produce cellular oxidative damage. Tumor hypoxia is thus a limiting factor affecting the effects of current photosensitizers.

Therapeutic implications

The capacity of photosensitizers to exert their activity independently of the level of tumor oxygenation reduces the risk of resistance.

The lack of off-targets in the absence of light activation provides photosensitizers with a safe profile even when systemically distributed.

The exclusive enrichment in the endoplasmic reticulum makes these photosensitizers particularly suited to selectively and efficiently kill tumor cells.

Invention

A family of photosensitizers with innovative breakthroughs has been developed:

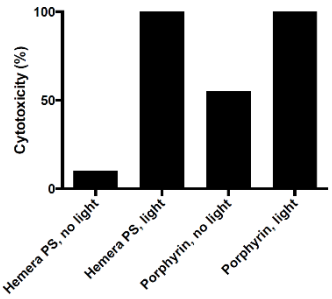
- Cytotoxic effects under hypoxia conditions,
- High potency in light conditions (low IC_{50}),
- No off-target activity in the absence of light,
- Good *in vitro* ADME-Tox properties,
- *In vivo* POC in human tumor xenograft,
- Accumulation in the endoplasmic reticulum,
- Known mechanism of action

These criteria position the photosensitizers beyond the current reference products, including porphyrin and thiazine derivatives.

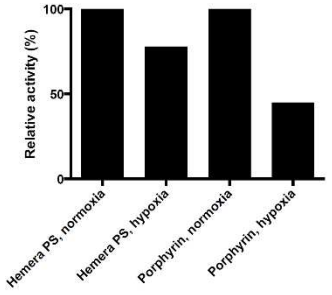
Technology Status

This work resulted in the identification of NCEs (PCT patent application filed).

No activity of Hemera photosensitizer (PS) in the absence of light (*vs.* porphyrins)



Activity of Hemera photosensitizer (PS) maintained under hypoxia (*vs.* porphyrins)



INTERESTED TO DEVELOP AND/OR COMMERCIALIZE THIS TECHNOLOGY?

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