Prostate Cancer Targeting Peptide

[2021-044]

Therapy - Oncology

- TRL 3-4
- Preclinical

Problem

Prostate cancer remains a leading health challenge, affecting millions of men worldwide. Traditional treatments often come with significant side effects due to the systemic distribution of anticancer drugs, which can harm healthy cells. The need for targeted therapy is critical: a method that specifically addresses cancerous cells while sparing the rest of the body.

Current prodrugs—inactive compounds converted into active drugs in the body—have been explored for this purpose. However, they often lack the necessary specificity and rapid activation, leading to suboptimal therapeutic outcomes and delayed responses.

A solution that can selectively and swiftly target prostate cancer cells without affecting healthy tissue, thereby improving patient outcomes and quality of life is highly desirable.

Solution

Our team has developed a system that has a pro-moiety for conjugating to a drug to form a prodrug that is then rapidly and selectively cleaved by prostate specific antigen (PSA), an enzyme highly expressed in prostate cancer cells. This novel approach uses a two-peptide system that increases the selectivity and rate of removal of a masking group from a pro-drug by PSA.

The first peptide is engineered to bind to drugs, forming a prodrug and the second peptide ensures low cellular uptake before activation, allowing precise delivery to cancer cells. Upon reaching the target, PSA cleavage releases the active drug, initiating a potent therapeutic effect. This technology promises higher treatment efficacy with minimal side effects because of its precise activation and cell targeting, optimizing the therapeutic window for prostate cancer patients.

Intellectual Property Status

PCT/AU2023/050638

Potential Commercial Applications

- Targeted therapy for prostate cancer
- Diagnostic imaging for prostate cancer detection
- Increasing efficacy and reducing side effects arising from off-target activity
- Personalized medicine approaches to treatment
- Platforms for drug delivery in other conditions mediated by proteolytic enzymes

Inventors

Professor Trevor Hambley, Elisabeth Tondl

Scientific Data

Additional data and information is available at:
WO2024036358A1 - A pro-moiety for forming a prodrug selectively cleaved by prostate-specific antigen (psa).

Contact Commercialisation Office
Name: Emma-Louise Hunsley
Position: Commercialisation Manager – Sydney Biomedical Accelerator
Email: emma-louise.hunsley@sydney,edu.au | Phone: 0437468275
sydney.edu.au/innovation-and-enterprise