"Novel Family of Clickable Polymers for Better Drug Delivery" VCU #12-071

Applications

- Drug delivery
- Gene delivery
- Polymer synthesis

Advantages

- Simple, fast, and low cost synthesis
- Precise and controlled synthesis
- Versatile and flexible (can be used for many different molecules)
- Easier drug delivery
- Better dose control
- Increased absorption and solubility

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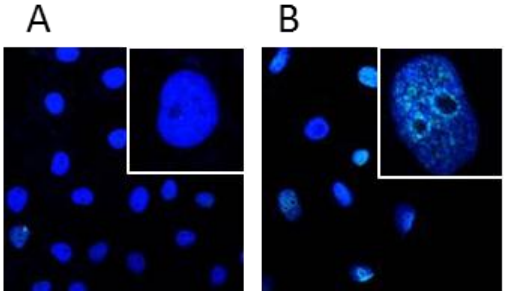
Market Need

Efficient and controlled drug delivery is crucial for a successful therapy. Many therapeutic agents can be toxic, insoluble or difficult to control the dosage when administrated directly. Click chemistry is a fast and low cost technology allowing for a simple modification of these challenging therapeutics. Not only does it offer an efficient, precise and controlled way to deliver them, but it is also flexible and versatile, making it very attractive for pharmaceutical companies.

Technology Summary

This technology presents a novel family of clickable oxatene-based polymers as a modular drug delivery platform. These polymer-drug conjugates are fast and easy to synthetize at low cost and allow for easier and better controlled drug delivery. The oxatene-based polymers are very versatile and can be used to improve delivery of many different drugs and genetic constructs, which might be toxic or insoluble on their own. Using the Camptothecin (CPT) as a proof of concept, *in vitro* studies performed by VCU researchers have shown the quick uptake of the conjugate by the cells and its distribution into desired areas. Furthermore, the oxatene-conjugated molecule was approximately 30 times less toxic than the unmodified one. This technology significantly improves the precision of controlled synthesis and provides a new means for the delivery system.



Increased cellular uptake of polymer-conjugated therapeutic agent (B) in comparison to non-modified drug (A)

Technology Status

Patent pending: U.S. and foreign rights are available.
In vitro data have demonstrated lower toxicity, better solubility and quicker uptake of modified therapeutics.

This technology is available for licensing to industry for further development and commercialization.