

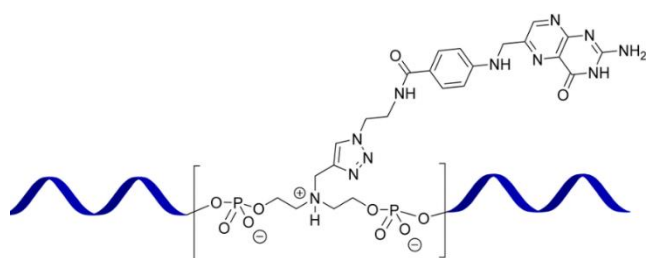
Novel Folate Phosphoramidite Synthesis and siRNA Nanotherapy

Background

RNAi is a natural pathway that targets and cleaves messenger RNA (mRNA), reducing gene expression. Harnessing this pathway, short-interfering RNAs (siRNAs) have emerged as promising therapeutics for cancer treatment. However, delivering siRNAs to their target sites remains a challenge. Current successful methods employ a liver-targeting ligand called tri-GalNAc and folate. The folate receptor is significantly upregulated in numerous tumors while demonstrating limited expression in non-malignant tissues. Despite the promise of folate conjugation as a delivery platform in cancer therapeutics, its application in RNAi has been limited by sophisticated, and often expensive chemical synthesis.

Technology Overview

Introducing a breakthrough in RNA interference (RNAi) research! The first technology represents a significant advancement in the field by providing a simple and cost-effective process to prepare a novel folate phosphoramidite intermediate.



This intermediate is compatible with standard solid-phase oligonucleotide synthesis protocols, addressing the limitations of current synthetic strategies in obtaining folate phosphoramidite intermediates on a meaningful scale.

The second technology introduces a group of folate siRNA analogs that hold tremendous potential for targeted siRNA delivery to cancer cells, enabling the specific deletion of harmful genes through gene silencing. These folate siRNA analogs are synthesized using the aforementioned folate phosphoramidite intermediate. Overcoming one of the major challenges in RNAi research, these analogs offer a solution for the delivery of siRNAs to target cells or tissues. The large size and polyanionic backbone of naked siRNAs typically hinder their diffusion across cellular membranes, making this technology a significant breakthrough in the field.

Business Opportunity

Ontario Tech University looks to work with companies in a way that helps develop a relationship that is tailored to their interests. Thus, are happy to explore collaborations, licenses, options, assignments, etc. It is the belief that only through enabling the company to utilize its business model will Ontario Tech University technology be able to make an impact within the marketplace.

Inventors:

Jean-Paul Desaulniers and Lidya Salim

Publication:

US Provisional Patent: 63/397191

[Synthesis of folate-labeled siRNAs from a folate derivative phosphoramidite](#)

About Ontario Tech University

Ontario Tech University conducts high-quality, rigorous research designed to meet the research and development needs of business and industry and benefit society. Whether the focus is on developing hydrogen-from-nuclear or fuel-cell technologies, improving network security, or understanding youth crime, we are committed to interdisciplinary research and development that addresses social, environmental, health, and economic challenges.