"NOVEL PRODRUGS UTILIZING A NOVEL TRANSPORTER-DIRECTED UPTAKE MECHANISM" VCU #10-095

Applications

- Prodrugs for large, lipophilic compounds
- Novel compounds that are substrates for fatty acid uptake transporters
- Drug delivery for antiretroviral and anticancer compounds
- Treatment for multidrug resistant tumors

Advantages

- Increased bioavailability and improved solubility for lipophilic compounds
- Eliminates viral recovery and drug resistance
- Potential for fetal drug delivery
- Enhanced and targeted drug delivery

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Market Need

Lipophilic compounds such as lopinavir, 2-methoxyestradiol and resveratol offer promising treatments for cancer and HIV. Unfortunately their effective use as pharmacological agents is limited by rapid metabolism and clearance and insufficient tissue distribution. Prodrug approaches, utilizing various transporters, have been developed to overcome these problems and enhance solubility, permeability and stability of compounds. However, the current transporter-directed prodrug approaches have a limited capacity to accept large lipophilic compounds. Therefore, new transporter systems and prodrugs are needed for these types of compounds.

Technology Summary

This technology expands the field of transporter-directed prodrug approaches to include large, lipophilic compounds. A series of novel compounds have been synthesized by modifying drug molecules to make them substrates for fatty acid uptake transporters previously unused for drug delivery. These prodrugs show enhanced solubility, permeability and stability. Therefore, this novel approach can be used to improve drug bioavailability to the body and allow for targeted drug delivery to certain tissue compartments such as the brain, placenta or drug-resistant tumor tissue.

Technology Status

U.S. Patent pending: 13/834,686

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