Invention
The invention is a CD38 specific ssDNA aptamer–chemotherapeutic drug conjugate and a CD117 specific ssDNA aptamer–chemotherapeutic drug conjugate for targeted therapy of cancers overexpressing CD38, as in the case of Multiple Myeloma (MM) or CD117, in the case of Acute Myeloid Leukemia (AML).

Background
For targeted therapy, the ideal delivery system should be able to carry high payload of therapeutic drug, be stable in vivo for systemic delivery, specifically target tumor cells of interest, and, more importantly, selectively release drug payload within the target cells for therapeutic effect. Our targeted ssDNA aptamer-drug conjugates are designed to fulfill those requirements. MM, a cancer of plasma cells in the bone marrow, is incurable and responsible for approximately 11,000 deaths per year in the US alone. CD38 has been found to be highly expressed on plasma cells and may be a good target for ssDNA therapies. A number of therapies have been developed to treat Acute Myeloid Leukemia with limited results. Patients typically present in their 60's and 70's and therefore are not candidates for standard chemotherapeutic treatment due to adverse toxicity. A CD117 specific ssDNA-drug conjugate may offer a less toxic treatment for these patients, as the conjugate can deliver its payload specifically to AML tumor cells, on which CD117 is highly expressed.

Advantages
- ssDNA-drug conjugates are stable under physiological conditions.
- Lower cost as can be chemically synthesized and conjugated with therapeutic drugs
- Stably carry high drug payload for systemic administration.
- Selectively target cancer cells via specific surface biomarkers.
- Low pH of lysosome triggers intracellular drug release after internalization.
- Negligible off-target toxicity to normal cells.
- High binding affinity with specific target.

For more information, contact the Office of Technology Transfer by e-mail at OTT@HoustonMethodist.org.

About Houston Methodist
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