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Self-assembled nano molecules for the repair and treatment of skin disorders

Abstract:

Twin base linkers (TBLs) are biocompatible, biodegradable nanomolecules capable of self-assembly to form rosette nanotubes (RNTs) under physiological conditions. TBLs have been suggested for use in drug delivery due to the presence of a hollow core in RNTs that can accommodate drugs, including hydrophobic drugs. TBLs contain covalently linked pairs of guanine-like and cytosine-like bases. Six such pairs form a six-member twin rosette stabilized by 36 hydrogen bonds, and the rosettes stack to form RNTs due to dispersion forces, base stacking interactions, and hydrophobic bonding. The outer surface of RNTs is hydrophilic, rendering them water soluble. RNTs have been shown to bind to cells, to enhance cell growth, and to have other beneficial actions on cells and tissues. TBLs can be functionalized with peptides, amino acids, or other biomolecules to impart biological properties such as fighting cancer, increasing tissue growth, killing bacteria, passivating viruses, etc. In this talk, in vitro and in vivo results will be shown in which TBLs were used to treat various skin disorders including but not limited to cancer, psoriasis, acne, scars, infection, and more.

Biography

Thomas J. Webster's (H index: 127) degrees are in chemical engineering from the University of Pittsburgh (B.S., 1995; USA) and in biomedical engineering from RPI (Ph.D., 2000; USA). He has formed over a dozen companies who have numerous FDA approved medical products currently improving human health in over 30,000 patients. His technology is also being used in commercial products to improve sustainability and renewable energy. He is currently helping those companies and serves as a professor at Brown University, Saveetha University, Hebei University of Technology, UFPI, and others. Dr. Webster has numerous awards including: 2020, World Top 2% Scientist by Citations (PLOS); 2020, SCOPUS Highly Cited Research (Top 1% Materials Science and Mixed Fields); 2021, Clarivate Top 0.1% Most Influential Researchers (Pharmacology and Toxicology); 2022, Best Materials Science Scientist by Citations (Research.com); and is a fellow of over 8 societies. Prof. Webster is a former President of the U.S. Society for Biomaterials and has over 1,350 publications to his credit with over 55,000 citations. He was recently nominated for the Nobel Prize in Chemistry. Prof. Webster also recently formed a fund to support Nigerian student research opportunities in the U.S.