

MOLECULAR ENGINEERING OF BIOLOGIC DRUG THERAPIES AND DIANOSTIC PLATFORMS

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ABSTRACT

Biologic drug therapies based on proteins, RNA, DNA and engineered cells have the broad target range that could translate the potential of the Genome Era into impactful new classes of therapeutics and Individualized Medicines. Today, however, biologic drug therapies are often limited by delivery and manufacturing barriers. We have been developing RAFT-based polymeric drug carriers and cell manufacturing systems that enable new approaches to biologic therapies. These platforms also provide opportunities for small molecule therapies and biomarker/diagnostic profiling. The delivery systems for proteins and nucleic acids mimic the highly efficient intracellular delivery systems found in pathogenic viruses and organisms. The carriers are applicable to a wide range of biotherapeutics, and might open up new families of peptide, antibody or nucleic acid drug candidates that attack previously inaccessible intracellular targets. Polymeric materials of a similar class are being developed to improve biomarker and cell isolation technologies, as well as to improve biological manipulation steps necessary to scale and streamline new T-cell and stem cell therapies. This talk will highlight some of the new capabilities of the therapeutic, diagnostic, and cell manufacturing platforms.