

S009 Dendrimer Based Nano-Containers/Scaffolding for Targeted Diagnostics /Therapies

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Dendrimers are routinely synthesized as tuneable nanostructures that are designed and regulated as a function of their size, shape, surface chemistry and interior void space. They are obtained with structural control approaching that of traditional bio-macromolecules such as DNA/RNA or proteins and are distinguished by their precise nanoscale scaffolding and nano-container properties. This lecture will review progress on the use of these features for both targeted diagnostic and drug delivery applications. Recent efforts have focused on the synthesis and preclinical evaluation of a multi-purpose, STARBURST® poly(amidoamine) (PAMAM) dendrimer prototype that exhibits properties suitable for use as: (i) a targeted, diagnostic MRI contrast agent (ii) and/or for controlled delivery of cancer therapies. Special emphasis will be placed on the lead candidate, namely; (*core*: 1,4-diaminobutane; G=4.5); [*dendri*-PAMAM(CO₂Na)₆₄]. This dendritic nanostructure was selected based on a very favorable nanotoxicity profile*, the expectation that it will exhibit desirable kidney excretion properties and demonstrated targeting features.

*The Nanotechnology Characterization Laboratory (NCL), an affiliate of the National Cancer Institute (NCI) has studied the lead compound and found it to be very benign and highly biocompatible.