Lipid Bilayer-Stabilized Calcium Phosphate Nanoparticles for Drug and Gene Delivery

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Abstract

Small nanoparticles (30-50 nm) containing an amorphous precipitate of calcium phosphate with a wrapping lipid bilayer have been developed to deliver impermeable drugs and genes to intracellular targets. Plasmid DNA, siRNA, mRNA, peptide antigen and small chemo drugs have been delivered with LCP to tumor and liver. Both mechanism and application of the nanoparticles will be discussed.

Biography

Leaf Huang, Ph.D. is the Fred Eshelman Distinguished Professor, Division of Molecular Pharmaceutics in the Eshelman School of Pharmacy, University of North Carolina at Chapel Hill. Dr. Huang’s research has been in the area of gene therapy and targeted drug delivery. He has pioneered the liposome non-viral vector and has designed and manufactured the cationic lipid vector for the first non-viral clinical trial in 1992. His current work centers on nanoparticle vectors for gene transfer in tumor and liver. He also continues research in establishing a ligand targeted delivery system for cDNA, mRNA, siRNA, proteins and peptides for tumor growth inhibition and for vaccines in treating cancer and infected diseases. He has authored or co-authored more than 350 peer-reviewed papers and more than 140 reviews and book chapters with an H-index of 104. He is also the inventor or co-inventor of 17 US and foreign patents. In 2004, he received the Alec D. Bangham MD FRS Achievement Award, which is the highest honor in liposome research. He will be the recipient of the 2013 Distinguished Pharmaceutical Scientist Award which is the highest scientific recognition of the American Association of Pharmaceutical Scientists. Dr. Huang has also co-founded 5 biotech start-ups in the past.