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Application of calcium phosphate nanoparticles in biomedicine



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Calcium phosphate has a high biocompatibility because it is the inorganic component of human hard tissue (bone and teeth). Therefore, its application in biomedicine is widespread. Calcium phosphate nanoparticles can be prepared by rapid precipitation, followed by an immediate functionalization with nucleic acids, polymers, and fluorescing molecules. Calcium phosphate nanoparticles can be applied for transfection (expression of certain proteins), for gene silencing/antisense experiments (selective inhibition of protein expression), for drug delivery (e.g. photodynamic therapy), for specific cell targeting or for imaging of tissues and intracellular structures. In addition, the stimulation of the immune system is possible by custom-made multi-shell calcium phosphate nanoparticles.