# Inorganic nanolayers: structure, preparation and biomedical applications


## Abstract

Hydrotalcite-like compounds are two-dimensional inorganic nanolayers also known as clay minerals or anionic clays or layered double hydroxides/layered hydroxy salts, and have emerged as a single type of material with numerous biomedical applications, such as drug delivery, gene delivery, cosmetics, and biosensing. Inorganic nanolayers are promising materials due to their fascinating properties, such as ease of preparation, ability to intercalate different type of anions (inorganic, organic, biomolecules, and even genes), high thermal stability, delivery of intercalated anions in a sustained manner, high biocompatibility, and easy biodegradation. Inorganic nanolayers have been the focus for researchers over the last decade, resulting in widening application horizons, especially in the field of biomedical science. These nanolayers have been widely applied in drug and gene delivery. They have also been applied in biosensing technology, and most recently in bioimaging science. The suitability of inorganic nanolayers for application in drug delivery, gene delivery, biosensing technology, and bioimaging science makes them ideal materials to be applied for theranostic purposes. In this paper, we review the structure, methods of preparation, and latest advances made by inorganic nanolayers in such biomedical applications as drug delivery, gene delivery, biosensing, and bioimaging.



**Keyword:** Inorganic nanolayers; Layered double hydroxides; Layered hydroxy salts; Drug delivery; Biosensors; Bioimaging