

Special Issue

Application of Layer-by-Layer Self-Assembled Nanocoating for Drug Delivery

Message from the Guest Editors

This Special Issue will focus on the application of nanoshells based on layer-by-layer adsorption of oppositely charged macromolecules onto a substrate and their application in drug delivery and targeting. The basis of the method involves resaturation of polyion adsorption, resulting in reversal of the terminal surface charge of the film after deposition of each layer. By manipulating both the ratio of wall to core and the wall composition, the shells can be precisely tuned. No covalent binding is involved in shell formation, which allows the drug or macromolecules to remain intact. Empty nanocapsules can also be prepared after thin-film coatings are formed on colloidal cores that can be dissolved. These empty capsules can be loaded with a drug via diffusion. Controlled release of the capsule interior may be achieved with pH or temperature change, or through external physical influences such as IR laser impulses or alternate magnetic fields. Different templates such as organic and inorganic colloid particles, protein aggregates, and drug nanocrystals, with sizes ranging from a few nanometers to tens of microns, can be coated with these nanoorganized multilayer films.

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