Development of a novel enzymatic method for measuring levels of mizoribine, an immunosuppressive drug, in serum

The method will be applied to high-throughput measurement of serum mizoribine

Mizoribine (MZR), an immunosuppressive drug, has been used for treatment in organ transplantation, lupus nephritis and rheumatoid arthritis. Orally administrated MZR is adsorbed, phosphorylated to MZR 5'-mono phosphate (MZR-P) and then inhibit inosine 5'-mono phosphate dehydrogenase. In this way, MZR-P blocks nucleic acid synthesis, which in turn inhibits proliferation of T and B cells. In order to refine optimum individual dosage of MZR, it is important to measure MZR levels in serum. Although only available method is high-performance liquid chromatography analysis, it is not suitable for high-throughput measurement of MZR levels in serum. Here, we identified a novel nucleoside kinase, which phosphorylates MZR, and developed an enzymatic method for measuring serum MZR levels. This enzymatic method can be applied to an automatic clinical analyzer for measuring a set of serum samples.

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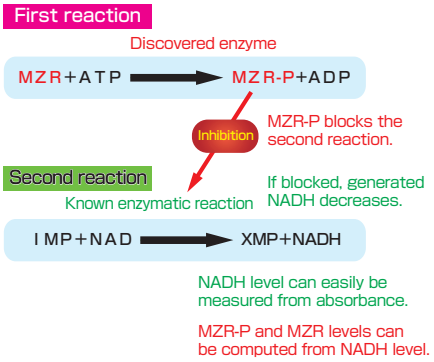

Enzymatic method for measurement of mizoribine

Development of a technique for mass production of metal-containing organic nanotubes

Expected to be used as catalysts, in DNA separation, and as templates of metallic nanomaterials

We have developed a technique for mass production of metal-complex-type organic nanotubes (ONTs). Just mixing an aqueous solution of metal salt and an alcohol suspension of peptide lipid gives the metal-complex-type ONTs. Exchange of proton of the lipids and metal cations occurs rapidly, and the original plate structures of the lipids convert into the nanotube structures within a few minutes. We can obtain more than 100 g dry nanotubes from 1 L solvent just by filtration. These metal-complex-type ONTs are expected to apply in various fields such as medical, health, nano-biotechnologies, and electronics. For example, metal cations on the surfaces can be connecting sites of various materials such as functional molecules and biological macromolecules. Metal cations both on the surfaces and in-between the layers can be also good templates for metal nanostructures.

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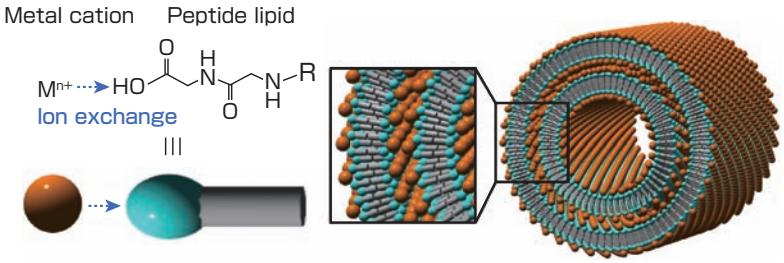

Proposed structure of metal-complex-type organic nanotube