

Vitamin B12 - Porphyrin double layer functionalized diatoms for simultaneous drug delivery and photodynamic therapy

Philippe Schiel

Drug delivery systems and alternative methods like photodynamic therapy to treat cancer are hot topics in the field of chemistry. The use of photodynamic therapy and anticancer drugs is often limited by its non-selective cell destruction. Overcoming this problem would lead to targeted tumor cell death, causing less side effects and the use of lower amounts of cytotoxic compounds. Our approach envisages using vitamin B₁₂ as tumor targeting agent and bind this to a metal porphyrin, acting as a photosensitizer for photodynamic therapy. Further, this compound is attached to diatomite earth microparticles, operating as shuttles for anticancer drugs. This new structure, designed to bind preferably to cancer tissue, could simultaneously be used for drug delivery and photodynamic therapy.

Key words: Diatoms, diatomite earth microparticles, porphyrins, photodynamic therapy, vitamin B₁₂, cancer therapy, drug delivery.

Fabio Zobi