

Nanotechnology: towards a “Joystick” Medicine

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Editorial

Nanodrugs are one of the dreams of the near future: it would be nice to have a drug, embedded in a shield, traveling fast through the blood, dismissing the shield just at the very target, and heal!

This seems true for example in the case of a molecule against cirrhosis, shielded of sugar, not interacting in blood, fast reaching just via diffusion and circulation the liver - eager of sugar, thus exposing the drug - and locally improving.

But in general, it is not that easy. One of the standards is a lipid mantle, like cells do, or so called crystal liquid nowadays: they can be engineered to resist until target, and then start dissolving and releasing. Results are not yet always comforting. Two main points rest at least to be solved.

First of all, it should be cared how fast the nanoparticle can arrive to target: circulation and diffusion are good for the liver example above,

but may not be enough for other targets. A first improvement should thus be to embed in the crystal liquid mantle not just the active chemical principle, but also for instance a magnetic component, whose function could be to be able to more easily be actively driven in place at the very target from outside the body, like when a joystick is used to drive a player on a playstation. In this way, faster arriving at target should be guaranteed, also in time not to let the dissolving constant of the lipid mantle already dissolve too much and release drug before target.

That would already be quite a n improvement and could indeed be the first step of a forecasted program. A second even further step, less physical and more chemical, would then also be to design the shield in such a way to be able to program at what time to dissolve and free the active molecule, ideally exactly when target is reached, like with the top firing button of the recalled joystick metaphor! How to do that sounds less evident, but chemistry improvements could make such further step one of the great improvements of the very next future in the field.

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