

Enzyme Catalysis to Power Nanovehicles Towards Nanomedicine

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Engineering tiny bots that can be applied in life science is opening many avenues in fields such as robotics, biosensing, nanomedicine, on-chip microfluidics and more [1]. One example could be the active and direct transport of drugs to specific locations enabled by hybrid micro-nano-bots, which are powered by highly efficient enzymatic catalytic reactions. [2]

Here, I will present our recent developments in the field of bio- and nano-engineering systems that can be autonomously swim and perform complex tasks. We fabricate nano-bots from mesoporous silica nanoparticles [3], microcapsules[4], and nanotubes [5]. Our types of hybrid Nano-bots combine the best from the two worlds, biology and nanotechnology providing remote control with biocompatible fuels. We recently demonstrated the motion of nanomotors in glucose and urea fuel, overcoming the limitations of former systems where toxic fuels were employed. Current results are devoted into the internalization of nanomotors into living cells and their motion in 3D bioengineered complex media.

References

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