The future is now: Here are the most promising synthetic biology projects

Never has it been more possible to engineer biology (see ‘Tailor, not tinker’). But solving grand problems requires a switch from demonstrating that something is feasible in a laboratory to homing in on a few ambitious goals. The time has come to decide where to focus this emerging ability to engineer biology — and to commit resources to doing it.

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My ‘wish list’ is as follows:

Artificial blood cells. Blood transfusions are crucial in treatments for everything from transplant surgery and cardiovascular procedures to car accidents, pregnancy-related complications and childhood malaria.

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Designer immune cells. Immunotherapy is currently offering new hope for people with cancer by shaping how the immune system responds to tumours.

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Smart delivery vehicles. The relative ease of exposing cells in the lab to drugs, as well as introducing new proteins and engineering genomes, belies how hard it is to deliver molecules to specific locations inside living organisms. One of the biggest challenges in most therapies is getting molecules to the right place in the right cell at the right time.

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In ten years’ time, this wish list could seem either ridiculously myopic or foolishly ambitious. That is what makes this era of engineering biology so exciting. Whether or not these goals are reached, the attempt to build systems from known parts will focus our attention on the significant gaps in our understanding of how such systems work.

Read full, original post: Which biological systems should be engineered?