Neues Denken. Neue Materialien.

SYNTHETIC BIOLOGICAL STRATEGIES TO DESIGN FUNCTIONAL MATERIALS

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Host: Prof. Dr. Aránzazu del Campo

Materials synthesized by nature are a continuous source of inspiration for material scientists. Natural materials have fascinating properties such as hierarchical organization, multifunctionality, adaptivity, self-healing, resilience or energy autonomy. Re-constructing such properties in technical systems has yielded innovative high-performance materials but has also shown the limitations of bio-inspired design. The emergence of synthetic biology is opening new possibilities to overcome these limitations. Synthetic biology allows to engineer biological components such as macromolecules or cells to functionally integrate into or to produce materials for a multitude of applications. Here, we will give an overview of strategies to engineer biological systems and will exemplarily present how synthetic biology can contribute to materials sciences by (i) combining polymer materials with engineered cells for designing remote-controlled cell-therapies, (ii) using engineered drug targets to construct externally controlled biohybrid vaccine depots and, (iii) engineering biological signalling molecules to synthetize information-processing biohybrid materials. We will provide a perspective of how future research at the interface of materials sciences and synthetic biology can create materials with properties beyond those developed in each discipline alone.

KONTAKT

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