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**Abstract**

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*Exploring a new way of assessment – the case of Synthetic Biology*

The highest potential for preventing negative path dependencies have societal interventions that influence innovation processes as early as possible, if achievable already in the research phase of technological developments.

Synthetic biology (SB) is a rapidly emerging and diverse field of biology with ambitious claims. Its subfields still reside in a stage of mainly basic research. The project SynBioTA – a technology assessment of synthetic biology - therefore represents in fact rather research assessment than technology assessment.

At this stage knowledge of possible effects of new technologies is low and fragmentary. And if above all only vague concepts for applications exist, assessment is confronted with the need to change its analytical focus from the effects to the trigger, to the new functionalities enabled by SB.

We look at the practice of synthetic biologists following the hypotheses, that their ways of reducing complexity, their theoretical (models) and practical abstractions (experiments) have consequences regarding unexpected side effects in subsequent applications. The investigation of scientific paradigms, methodological approaches and corresponding subsequent applications should provide a basis for an early assessment of prospects and hazards accompanying the new or improved functionalities of SB.

In this way a number of promising functionalities could be identified with respect to prospective application fields of SB. With a categorization of their prospects and hazards as well as guiding design principles for possible low-hazard development paths our results provide early orientation for precautionary governance avoiding conflicts in later stages when negative implications of already established products and processes become effective.

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