

Differentiating the discussion on synthetic biology

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Synthetic biology is not a monolithic bloc, it is diverse and on the move. The general subfields are well described. However the large diversity of the disciplinary backgrounds of the scientists contributes not only to the structuring of the field but is also framing the individual research agendas to a great extent. On a closer look even the described subfields (engineering approach, synthetic genomic, protocell research and so on) are not eligible to reflect the realities of the research field. Also regional differences in research agendas and cultures between for example Europe and the US add up to the diversity of the field. That makes societal evaluation of synthetic biology a challenging task and prone to misunderstandings. Confusions arise not only on the level of what part of synthetic biology the discussion is on, but also on the level of the underlying concepts in use. Here some readjustments to do more justice to the heterogeneity of synthetic biology are suggested. Instead of directly reviewing the field as a whole, it is suggested to focus on characteristic *features* of synthetic biology that are relevant for the societal discussion. An important example of these features is the enlarged depth of intervention. Some of these features apply only to parts of synthetic biology, where others might be relevant for synthetic biology as a whole. In the next step this refined view can be utilized for ethical evaluation, risk assessment, analysis of public perception and legal evaluation. This approach will help to differentiate the discussion on synthetic biology and to facilitate and support a problem oriented and sound evaluation of synthetic biology.

To bring this approach to a wider scope a future research agenda could be envisioned in three steps:

- In a first step the actual status of the field could be monitored on the basis of qualitative interviews. Here it would be important to appreciate regional differences as well as the diversity of the disciplinary backgrounds of the scientists that frame the field. On the basis of this work, the specific features that come along with different spaces of synthetic biology should be further characterized. The characterized features should be in addition set into proportion with their relevance to the whole field.
- Once the specific features are characterized, they should be analyzed with respect to the risk assessment and ethical and legal ethical evaluation. What should be for example the level of intervention? At which level of uncertainty?
- In a last step it is important to develop strategies to voice this diversity in the public space and also back to the field of synthetic biology.