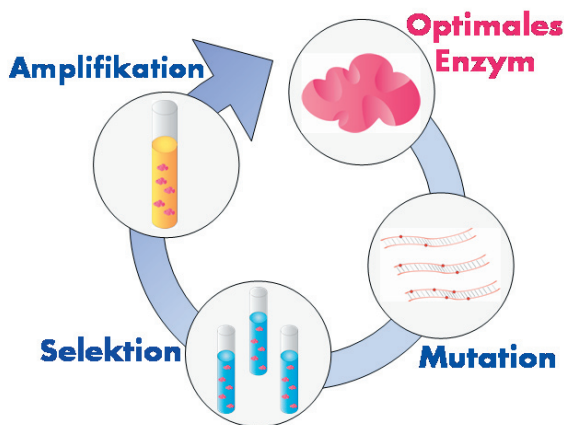


Keywords

- Directed Evolution
- Polymerase
- Exonuclease
- Antiviral Agents
- Single Molecule Sequencing



Directed Molecular Evolution of Enzymes

In our work we focus polynucleotide polymerases and exonucleases and subject these enzymes to directed molecular evolution processes for functional optimisation. Polymerases attract much attention because of their central role in DNA metabolism and because they most probably represent an important link to various diseases such as tumour growth, defects of the immune system, stress-associated mutagenesis or viral infections. Several polymerases are indispensable tools for molecular biotechnology, e.g. for amplification of DNA by PCR, synthesis of RNA by *in vitro* transcription, mutagenesis or sequence analysis. They could be even more valuable if the range of substrates accepted, or their activity and stability, could be „tuned“ to specific requirements. We employ the method repertoire of directed evolution to produce polymerases with improved or altered substrate tolerance. A major goal of our research is to locate the lynchpins of substrate recognition and fidelity and to elucidate structural elements and conformational transitions that control this essential feature.

Contact

PD Dr. Susanne Brakmann
NWG „Angewandte Molekulare Evolution“
Fakultät für Biowissenschaften, Pharmazie
und Psychologie

Institut für Biologie II
Liebigstr. 18
04103 Leipzig
Fon +49-(0)341-97 37832
Fax +49-(0)341-97 37838
sbrakma@rz.uni-leipzig.de
www.uni-leipzig.de/bbz/brakmann

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