Colloquium Sabrina Krepel – 9-7-2020

Biomolecular Sciences

How enzyme engineering can solve the plastic problem

Plastic pollution is an emerging problem for our current and future generation. Between 4.8 and 12.7 billion metric tons of plastic is estimated to end up in oceans each year and the threat associated with the durable materials is not to be underestimated. Although enzymes capable of degrading these durable materials can provide the solution to this problem, a lack of thermal stability, efficiency and cost-effectiveness limit their application. Enzyme engineering provides a way to elevate the effectiveness of enzymatic degradation to a high level. With the application of rational and randomized design to natural plastic degrading enzymes, a promising array of improved enzymes has been developed that allow us to significantly reduce the plastic waste that is currently produced.

Poly ethylene terephthalate (PET) is one of the biggest contributors to plastic waste as the main component in packages and plastic bottles. In this colloquium, recent developments in the enzyme engineering of current PET-degrading enzymes will be discussed and how they will be helpful in the near future.

Main resources[1–3]

1. Papadopoulou, A., Hecht, K. & Buller, R. Enzymatic PET degradation. *Chimia (Aarau).* **73**, 743–749 (2019).
2. Tournier, V. *et al.* An engineered PET depolymerase to break down and recycle plastic bottles. *Nature* **580**, 216–219 (2020).
3. Sharma, A., Gupta, G., Ahmad, T., Mansoor, S. & Kaur, B. Enzyme Engineering: Current Trends and Future Perspectives. *Food Rev. Int.* **00**, 1–34 (2019).