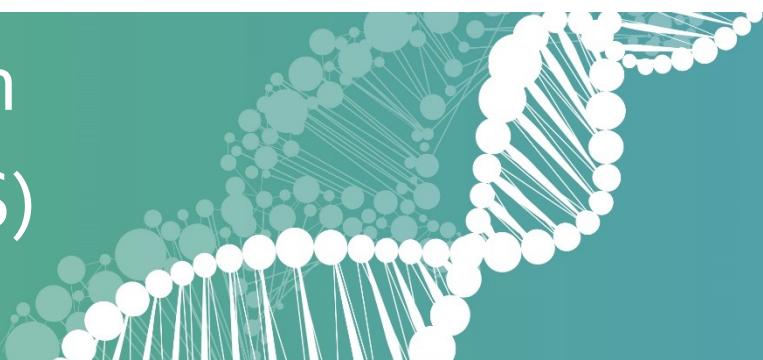


Global Research and Innovation in Plastics Sustainability (GRIPS)



Microbial Integration of Plastics in the Circular Economy

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Project partners



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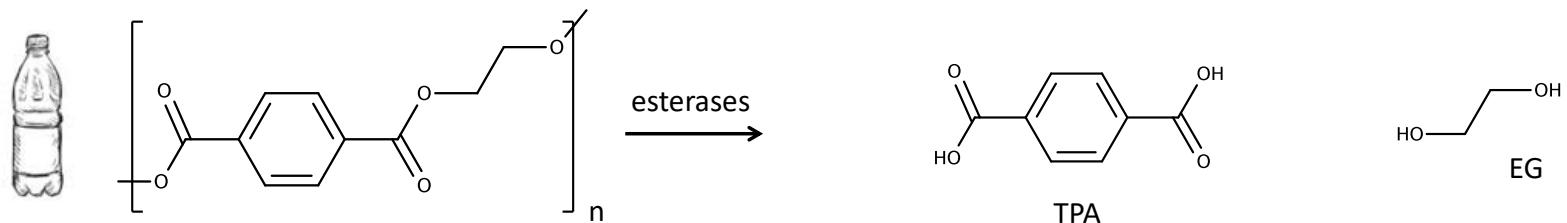
- Total project budget: EUR 1.694 m
- Duration 3 years

- PET is among the polymers with the highest recovery rates (70% in Europe)
- Only 7% of it is turned into new containers (World Economic Forum, 2015)

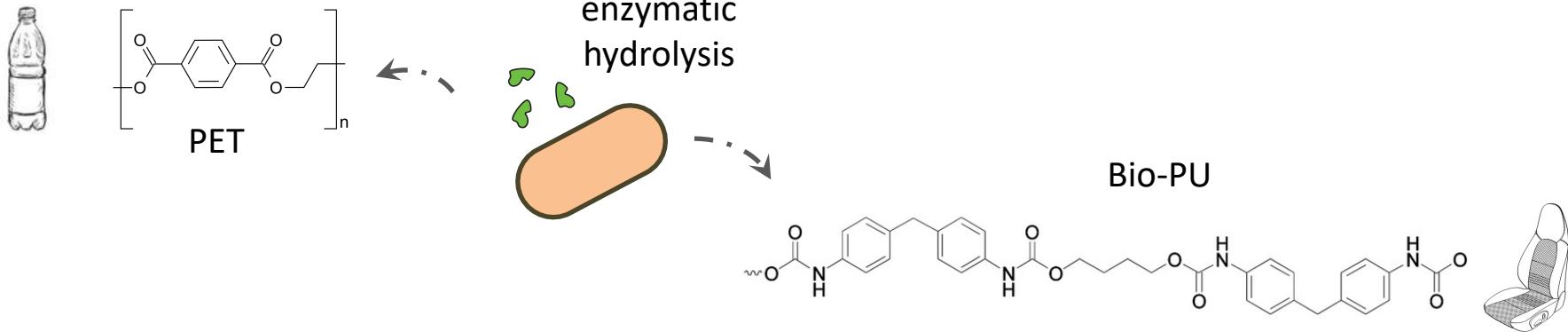




- Reasons for low recycling include presence of additives (dyes, plasticisers, etc.)

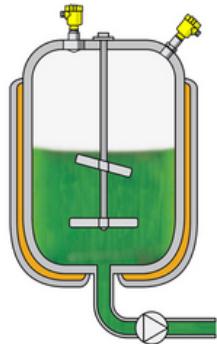


- Objective: Turn post-consumer PET into a microbial feedstock for its up-cycling into polymers with added value
- Approach: Engineer microbial communities that can reliably assimilate PET and produce building blocks for bio-PU

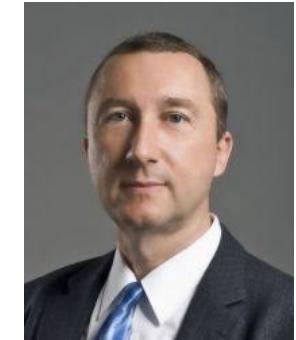
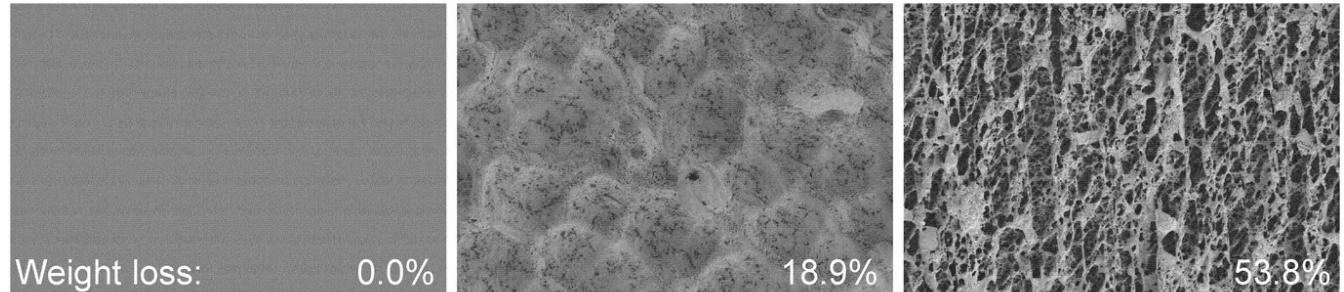


TA

Enzymatic hydrolysis of post-consumer PET



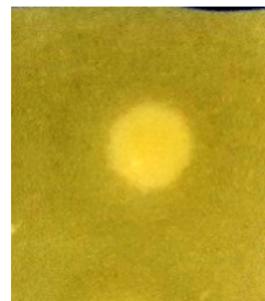
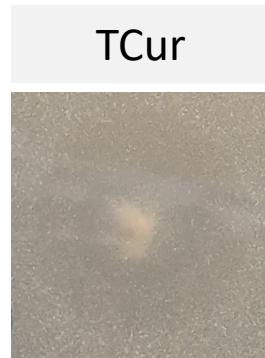
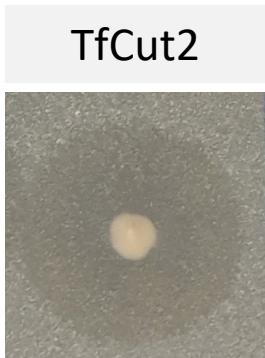
- PET food packages dissolved at 60-70 deg



Prof. W. Zimmermann

UNIVERSITÄT LEIPZIG

- Microbial degradation of PET



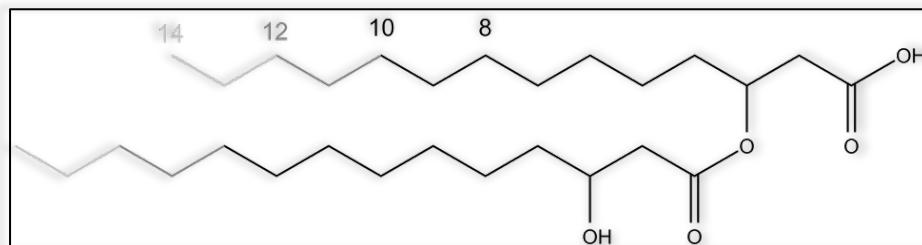
Imperial College
London

Pseudomonas
putida KT2440

Pseudomonas
umsongensis GO16

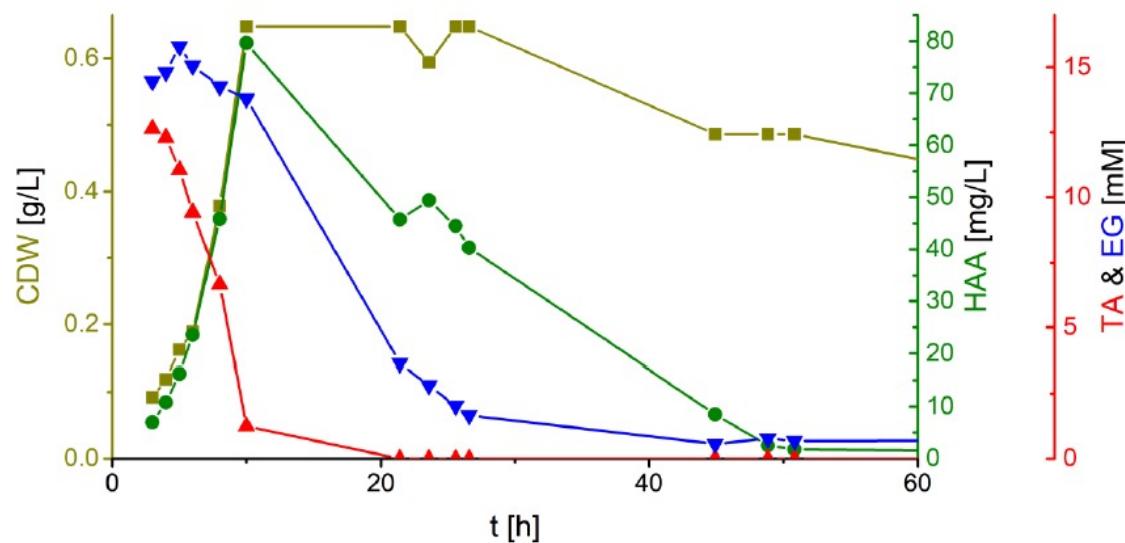
Production of monomers from PET

Hydroxyalkanoic acids (HAAs)



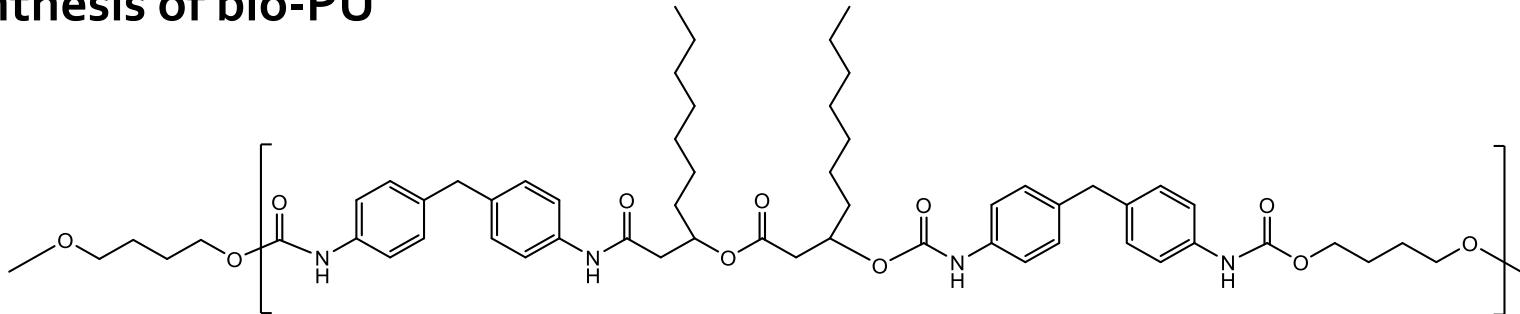
Prof. L. Blank

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UNIVERSITY



- HAAs produced from terephthalate and ethylene glycol resulting from PET hydrolysis

- Synthesis of bio-PU



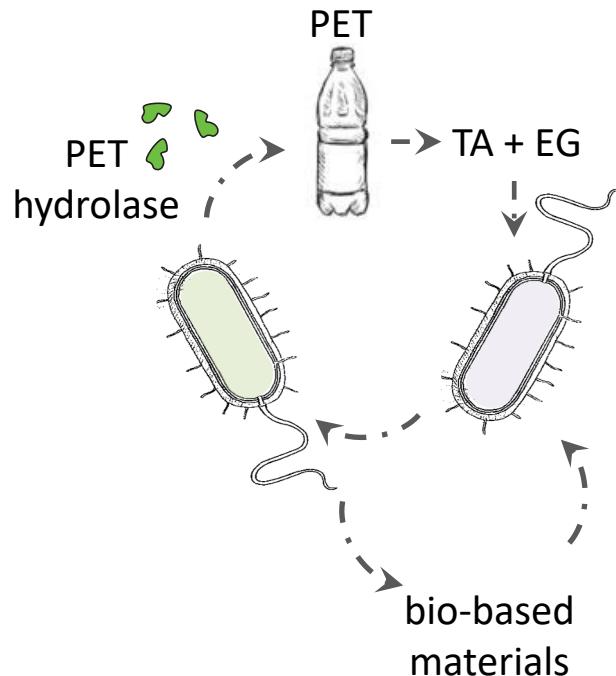
- Copolymerization of 4,4'-diphenylmethylene diisocyanate, 1,4-butanediol, and HAA leads to a second generation poly(amide urethane)



Eng. Remi Perrin



- We propose a circular approach for the microbial transformation of PET and PU in bio-based materials (bio-PU)



- Main goal: Turn post-consumer PET into a microbial feedstock

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