Past iGEM teams that worked on plastic problems

2011 Freiburg	・Created a cellular, self-replicating purification device for His-tagged proteins ・Used Plastic Binding Domain, which binds the polystyrene surface. It helps protein prification	http://2011.igem.org/Team:Freiburg
2012 BAU-Indonesia	・Isolation of cutinase gene from nature with primers	http://2012.igem.org/Team:BAU-Indonesia
2012 TU Darmstadt	・Surface display of cutinase on E. coli ・Attempted TPA transport into E. coli, further research required ・Expressed all TPH enzymes, did not attemt to measure activity ・Comfirmed anaerobic conversion of PCA via AroY and XylE enzymes	http://2012.igem.org/Team:TU_Darmstadt
2012 UC Davis	・Confirmed cutinase activity using PNPB esterase assay ・Engineered E.coli ethylene glycol metabolism with directed evolution	http://2012.igem.org/Team:UC_Davis
2013 Imperial College	・Producted P3HB bioplastic from mixed waste containing at least some PET	http://2013.igem.org/Team:Imperial_College
2014 METU Turkey	・Reduced catechol (downstream product) to pyruvate	http://2014.igem.org/Team:METU_Turkey
2014 ITB Indonesia	・LC cutinase activity confirmed with SEM, PNPB	http://2014.igem.org/Team:ITB_Indonesia
2015 Pasteur Paris	・PNPB assay to confirm activity of esterase EST13 ・Fluorescent detection of TPA cannot be accomplished when in LB broth	http://2015.igem.org/Team:Pasteur_Paris
2016 ASIJ Tokyo	・Attempt at detecting PET degradation by mass change failed	http://2016.igem.org/Team:ASIJ_Tokyo
2016 AUC Turkey	・Withdrawn	http://2016.igem.org/Team:AUC_TURKEY
2016 Baltimore BioCrew	・Planned to weigh PET degradation, no results	http://2016.igem.org/Team:Baltimore_BioCr
2016 BGU Israel	・PNPB and EM to confirm LC cutinase activity ・P.putida can grow on PCA as sole carbon source, but not TPA ・E. coli expressing LC-cutinase with pelB leader sequence grew on M9 plates with PET as sole carbon source. Expected to be due to consumption of ethylene glycol from PET degradation ・Unable to determine enzyme efficiency based on growth due to heterogeneity in PET distribution ・Measured fluorescence of TPA on plates, unable to quantify LC cutinase activity	http://2016.igem.org/Team:BGU_ISRAEL
2016 Harvard BioDesign	・Petase function confirmed with PNPB ・D.tsuruhatensis produced electric current when supplied with unspecified quantity of TPA in M9 media	http://2016.igem.org/Team:Harvard_BioDesign
2016 Tianjin	・EM confirmation of PETase activity of PET film degradation ・Multispectral scanning quantified PETase products for cell free system	http://2016.igem.org/Team:Tianjin
2016 TJUSLS China	・HPLC detection of MHET to confirm PETase activity in varying conditions ・Surface display of PETase in E. coli	http://2016.igem.org/Team:TJUSLS_China
2016 UESTC-China	・SEM and PNPB to confirm PETase activity ・Possible detection of TPA by UV vis (higher absorbance across spctrum)	http://2016.igem.org/Team:UESTC-China
2016 UoA New Zealand	・Assembled PETase part with His tag	http://2016.igem.org/Team:UoA_NewZealand

2017 Baltimore Bio-Crew	・Fluorescine diacetate hydrolysis assay to confirm PETase by culturing cells on PETase and MHETase hydrolytic activity	http://2017.igem.org/Team:Baltimore_Bio-Crew
2017 BOKU-Vienna	・Discussion of a possible method for directed evolution of PETase by culturing cells on PET film that fluoresces when degrated	http://2017.igem.org/Team:BOKU-Vienna
2017 ITB Indonesia	・Successful biofilm formation on PET, but biofilm matrix hampered PETase activity ・Engineered E. coli ethylene glycol metabolism with directed evolution	http://2017.igem.org/Team:ITB_Indonesia
2018 Makerere University	・Engineered bacteria that expressed PETase and MHETase to degrade PET. The bacteria were going to use in the city to degrade plastic wastes	http://2018.igem.org/Team:Makerere_University
2018 OLS Canmore Canada	・Created a novel fusion protein that can specifically bio-tag PET plastic to sort and recycle plastic ・Fused PETase to mCherry and used a hydrophobin in conjunction with the PETase mCherry fusion protein, which would help bind PETase to PET plastic	http://2018.igem.org/Team:OLS_Canmore_Canada
2018 ULaVerne	・Produced PETase-expressing E.coli and introduced it into wastewater plant and home washing machines to prevent microplastic runoff ・Aimed to increase the activity of PETase but failed	http://2018.igem.org/Team:ULaVerne_Collab
2018 UMaryland	・Produced Measurement method of plastic degradation by using E.coli whose fluorescence intensity changes according to the concentration of PCA, a by-product of TPA (terephthalic acid) metabolism	http://2018.igem.org/Team:Umaryland
2018 Yale	・Produced E.coli that decomposes plastics by PETase and MHETase ・Produced E. coli that metabolizes ethylene glycol (EG) through glycolysis ・Made Acinetobacter, which metabolizes terephthalic acid (TPA) in the citric acid cycle	http://2018.igem.org/Team:Yale
2019 Aachen	・Constructed a system that used magnetosome to detect nanoplastics in solution and specifically distinguish each polymer	https://2019.igem.org/Team:Aachen
2019 BUCT-China	・Aimed to search for enzyme and related genes to clarify PE/PS metabolic pathway	https://2019.igem.org/Team:BUCT-China
2019 Exeter	・Tried to create filtration system that is capable of capturing and degrading microfibres that detach from synthetic clothing ・Screened the enzyme collection to identify the most efficient mutant PETase and MHETase enzymes ・Engineered a more stable PETase that will be able to survive for a longer time in the filter	https://2019.igem.org/Team:Exeter
2019 HK_GTC	・Enhanced PETase degradation activity by creating mutants	https://2019.igem.org/Team:HK_GTC
2019 Humboldt_Berlin	・PETase and MHETase were introduced into Chlamydomonas reinhardtii to degrade PET into carbon dioxide and water. Generated carbon dioxide were used by Chlamydomonas to photosynthesize	https://2019.igem.org/Team:Humboldt_Berlin
2019 IIT_Chicago	・Aimed to reduce microplastics in the ocean by expressing I.s.PETase in cyanobacteria. ・They acomplished this in a dual-host plasmid shuttle vector in E.coli and then transferred to cyanobacteria by conjugation	https://2019.igem.org/Team:IIT_Chicago