what if waste... could clean up waste?



Shell-ter:Using shellfish waste ito filter chemotherapy-contaminated water

our impact













iGEM (International Genetically Engineered Machine Competition) is the world's largest synthetic biology competition, bringing together hundreds of teams to design synthetic biology projects addressing real-world problems.

Keep up with us!

This card is made of seed paper, which can betorn up, planted and watered to germinate new life. Just as we've given a new purpose to shellfish waste, you can do so with this card as well!

UCL Department of Biochemical Engineering

the problem:

Chemotherapy doesn't always stay in the hospital.

75% of platinum-based chemotherapy drugs are excreted unchanged in urine.

59% can pass through conventional wastewater treatment.

24 HOURS is enough for platinum compounds to cause irreversible genetic damage in aquatic organisms

Hospital wastewater currently has no specific UK discharge standard for these residues.

Excreted chemotherapydrugs cantherefore enter conventional wastewater systems and eventually our environment.

our solution:

A reusable filtration cartridge made from shellfish shells!



01 - ENGINEER

Bacteria produce enzymes (ChiA and deacetylase) that transform discarded shellfish shells into chitooligosaccharides (COS), a biosorbent.

02 - CAPTURE

The biosorbent binds to cisplatin - a type of chemotherapy residue - in wastewater.



03 - FILTER

COSispacked into a reusable cartridge, capturing chemotherapy residues before they enter the wider wastewater system.



Shellfish waste gets a second life by cleaning up another waste stream.