

# Edinburgh and Recyclatech Join Forces to Recover Microbial By-Products

A business interaction voucher from BioProNET has enabled scientists from the University of Edinburgh to partner with the SME Recyclatech to investigate a new way of recovering useful products from spent media.

Recyclatech uses industrial biotechnology processes that generate large volumes of spent medium, which contains mycolic acid-producing bacteria that contain high value glycolipid. The challenge was to develop a simple, cost-effective way to recover the surfactant-containing bacteria from the large volumes biosurfactants of spent medium.

Together the researchers discovered that the bacteria used by Recyclatech have the capacity to stabilise oil-in-water emulsions. The bacteria can become associated with the oil droplets in the emulsion, and so skimming off the oil droplets from the medium allows the bacteria to be captured and recovered.

“This represents an extremely facile and cost-effective procedure to collect bacteria from a batch reaction,” says Joe Tavecchi, an investigator on the project from the University of Edinburgh.

The biosurfactant can then be extracted from the bacteria using solvents.

Moreover, the collaborators showed that the capacity of the bacteria to stabilise emulsions and the type of emulsions they

could stabilise — oil-in-water or water-in-oil — was probably dependent by the amount of surfactant they hold within their cell walls, which in turn could be controlled by the amount and type of oil that they were fed.

“Working together with the university of Edinburgh has allowed us to demonstrate biosurfactant production and recovery from our novel bacteria, and has indicated further work to generate different surfactants,” says Nick Christofi, Chief Scientific Officer of Recyclatech.

The extracted biosurfactants can be used in pharmaceuticals, homecare and other products, while intact bacteria have the potential to clean oil from contaminated soils or water.

The outcomes of this work are promising, with initial data being used to support further grant applications and the possibility of scale-up studies. In addition, the collaboration has forged strong links between the partners. “We have been exposed to challenges that industry faces,” highlights Tavecchi. “We intend to channel such a perspective into our future work to increase its impact,” he says.

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