

Resource Summary Report

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Bio-derived Feedstocks for Sustainable UK-Based Manufacture of Chemicals and Pharmaceutical Intermediates

RRID:SCR_000490

Type: Tool

Proper Citation

Bio-derived Feedstocks for Sustainable UK-Based Manufacture of Chemicals and Pharmaceutical Intermediates (RRID:SCR_000490)

Resource Information

URL: <http://gtr.rcuk.ac.uk/project/239F234A-6BF7-4E28-8964-E882BAA8EB77>

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Description: Project aiming to establish a range of new technologies to enable the synthesis of a range of chemicals from sugar beet pulp (SBP) in a cost-effective and sustainable manner. The chemical and pharmaceutical industries are currently reliant on petrochemical derived intermediates for the synthesis of a wide range of valuable products. Decreasing petrochemical reserves and concerns over costs and greenhouse gas emissions are driving the search for renewable sources of organic synthons. The UK is self-sufficient in the production of SBP which is a by-product of sugar beet production (8 million tonnes grown per year) and processing. The ability to convert SBP into chemicals and pharmaceutical intermediates will therefore have significant economic and environmental benefits. SBP is rich in carbohydrate (nearly 80% by weight) which is made up of roughly equal proportions of 2 biological polymers; cellulose and pectin. To be cost-effective it will be necessary to find uses for each of these substances. The consortium will develop a biorefinery approach for the selective breakdown of both polymers, purification of the breakdown compounds and their use to synthesize a range of added value products such as speciality chemicals, pharmaceuticals and biodegradable polymers. It is already known that cellulose can be broken down into hexose sugars and fermented to ethanol for use in biofuels. The focus is on the release of galacturonic acid and arabinose (from pectin) and their conversion, by chemical or enzymatic means, into added value products. Synthetic Biology methods will also be explored to test the feasibility of metabolically engineering microbial cells to simultaneously breakdown the polymeric feed material and synthesize a desired product, such as aromatic compounds, in a single integrated process. In conducting this research the consortium will adopt a holistic, systems-led, approach to biorefinery design and operation. Computer-based modelling tools will be

used to assess the efficiency of raw material, water and energy utilization. Economic and Life Cycle Analysis (LCA) approaches will then be employed to identify the most cost-effective and environmentally benign product and process combinations. The project is supported by a range of industrial partners from raw material producer to intermediate technology providers and end-user chemical and pharmaceutical companies. This is crucial in providing business and socio-economic insights regarding the adoption of renewable resources into their current product portfolios. The company partners will also provide the material and equipment resources for the large-scale verification of project outcomes and their ultimate transition into commercial manufacture. The Intellectual Property (IP) expected to be generated by the consortium will most likely be related to new biocatalysts, synthetic routes, USD devices and modelling software. The data is accessible programmatically using one of three application programming interfaces GtR, GtR-2 and CERIF.

Abbreviations: BFSUKMCPI

Resource Type: portal, consortium, data or information resource, organization portal

Keywords: chemical, drug, drug development, pharmaceutical, manufacture, product development, sugar beet pulp, sugar beet, polymer, galacturonic acid, arabinose, biorefinery, cellulose, pectin, ethanol, biofuel

Funding: EPSRC

Availability: THIS RESOURCE IS NO LONGER IN SERVICE

Resource Name: Bio-derived Feedstocks for Sustainable UK-Based Manufacture of Chemicals and Pharmaceutical Intermediates

Resource ID: SCR_000490

Alternate IDs: nlx_158450

Record Creation Time: 20220129T080201+0000

Record Last Update: 20260728T043058+0000

Ratings and Alerts

No rating or validation information has been found for Bio-derived Feedstocks for Sustainable UK-Based Manufacture of Chemicals and Pharmaceutical Intermediates.

No alerts have been found for Bio-derived Feedstocks for Sustainable UK-Based Manufacture of Chemicals and Pharmaceutical Intermediates.

Data and Source Information

Source: [SciCrunch Registry](#)

Usage and Citation Metrics

We have not found any literature mentions for this resource.