

Biomass analysis: The key to success for your biorefinery process

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Credit: Celignis Analytical

Celignis founder Dr. Daniel Hayes discovered that although feedstock

composition was a critical factor for the success of biomass transformation processes, precise data was missing for a wide range of feedstocks. To address this issue, and avoid future problems in conversion processes, companies used to subcontract laboratories to chemically analyse biomass samples. This process is time consuming and expensive: taking approximately two weeks per sample, and costing hundreds of euros. Looking for solutions to improve this process, Celignis created a novel methodology for biomass analysis, modelling samples' composition according to the results of a near infrared spectroscopy analysis. Their method uses infrared light to determine the presence and quantity of important constituents in biomass materials. Following the analysis of hundreds of samples of different feedstocks across the world, Celignis developed unique algorithms to predict with high accuracy and precision the composition of biomass samples. In that way, up to 13 different parameters, including type and amount of sugars, lignin and ash, can be analysed for various types of biomass. And this in only one day, for less than a hundred euros per sample.

This process has been instrumental in the successful development and implementation of the BIOrescue biorefinery process. First of all, to analyse and predict the composition of used mushroom compost samples. Using complementary chemical analysis when necessary, Celignis could determine the type and amounts of sugar, lignin and ash present in the compost. Secondly, the models were also used to select the most suitable combination of used mushroom compost and other agricultural residues that will safeguard the success of the biorefinery process. After running several tests with feedstocks from various European regions, Celignis experts found out that [wheat straw](#), oat straw and barley straw were the most efficient to be combined with used mushroom compost to achieve a balanced composition of sugar and lignin for a productive biorefinery process. Based on this they determined precise balances of feedstocks to optimise process efficiency.

"In the transition towards a circular bioeconomy, we believe that accurate biomass analysis services are a key factor to unlock successful and profitable exploitation of sustainable biomass sources," says Dr. Hayes. "In that sense, we want to help companies reaching their full potential by providing them with precise data which will enable them to control each step of the biomass transformation [process](#)." After mushroom [compost](#), Celignis is looking forward to exploring new types of underutilised biomass and creating custom-made algorithms for rapid biomass [analysis](#) that will foster the development of innovative bio-based processes, and in the long run, the expansion of the bio-based industry across Europe.

More information: For more information, visit the BIOrescue website at www.biorescue.eu

Provided by CORDIS

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