Waste biorefinery technologies for accelerating sustainable energy processes

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From proposal to beamtime: a practical guide to open-access synchrotron facilities for bio-based materials research

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Abstract: Open-access research infrastructures provide unique opportunities to explore advanced techniques that are not available in many university laboratories. Synchrotron light sources are the most advanced large-scale research infrastructures providing tools that enable a wide range of experiments in fields like chemistry, physics, materials science, biology, and environmental research. Despite their potential, many scientists are still unfamiliar with the application procedures and often may see this process as too competitive or complicated.

This contribution presents a practical step-by-step guide to navigating synchrotron access from an idea to a granted beamtime. Based on first-hand experience with the SOLARIS (Krakow, Poland) and ELETTRA (Trieste, Italy) synchrotrons, it outlines the pathway from idea generation to successful beamtime allocation. As an example, the research on *3D imaging of biofilm–substrate interfaces* performed at the POLYX beamline (SOLARIS) will be presented. The guidance covers key steps, including identifying the appropriate beamline, preparing a competitive proposal, addressing feasibility requirements, performing experiments and handling data afterwards.

This contribution aims to encourage more researchers, especially those working in interdisciplinary fields, and at early stages of their careers, to make use of open-access research infrastructures. By outlining the pathway from proposal to granted beamtime, it supports knowledge exchange and fosters new opportunities for collaboration across disciplines.

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