The aim of the research was to determine optimal process conditions for *Thermomyces lanuginosus* lipase (TLL) production during solid-state cultivation on hull-less pumpkin oil pomace through sustainable and green chemistry principles.

**Methodology & Results:**

**SOLID-STATE FERMENTATION** – Box-Behnken experimental plan & numerical optimization

**TLL PRODUCTION, PURIFICATION & GREEN CHEMISTRY METRICS**

**Conclusions:**

- A reduced quadratic model of lipase production was proposed based on the optimization of five independent variables followed by a model validation with 95% of the percentage of accuracy.
- Maximum lipase production was obtained after 2 days of process duration with high volumetric and specific activity.
- The enzyme activity of 391 U g\(^{-1}\) proved that the developed process is highly efficient.
- Partial purification of the crude enzymatic extracts (15 U cm\(^{-3}\)) was investigated and highly concentrated lipase liquid preparation with the volumetric activity of 422 U cm\(^{-3}\) was achieved.
- The sustainability of the process was confirmed by a snapshot assessment using the green chemistry metric of E-factor and process mass index, quoting on the mass efficiency. The new lipase process was in the range of the best white biotechnology processes, as per green chemistry metrics ranking.