

LexMar Global Announces Collaboration with the University of Manitoba and the University of Chemistry and Technology in Prague to Advance LDPE Biodegradation Research

Haverhill, MA— (October 31, 2024)— LexMar Global Inc. is pleased to announce a successful collaboration with the Department of Biosystems Engineering at the University of Manitoba and the Department of Polymers at the University of Chemistry and Technology, Prague. This joint research effort aims to combat the growing plastic waste crisis by advancing the understanding of bacterial degradation mechanisms in low-density polyethylene (LDPE). The collaboration combines the bioengineering expertise of Dr. David Levin and Trinh Nguyen, the polyolefin characterization proficiency of Dr. Jan Merna, and leverages the NMR relaxometry expertise of LexMar Global to better analyze structural changes in LDPE during biodegradation.

The project demonstrated that a variety of microorganisms, such as *Cupriavidus necator*, *Pseudomonas putida*, and *Pseudomonas chlororaphis*, can degrade the low-molar mass fractions of LDPE. The results confirmed that degradation by these microorganisms is dependent on and most heavily impacts the amorphous fraction of the LDPE. LexMar Global's Magneflow equipment (MagStation II) was used to track the micro and macro changes in the polymer, offering deeper insights into potential strategies for enhancing biodegradation.

"NMR relaxometry served as a crucial tool in characterizing the changes in LDPE structure after microbial degradation, highlighting new paths toward sustainable plastic solutions.", said Dr. David Levin, Professor in the Department of Biosystems Engineering at the University of Manitoba in Canada. Dr. Kohlmann added: "We are excited that our industrial expertise in polyolefin analysis could be applied to advance the understanding of microbial degradation which offers hope for combating plastic pollution.

For further information, please see our open access publication in Polymers:

Nguyen, T.; Merna, J.; Kysor, E.; Kohlmann, O.; Levin, D.B. *Bacterial Degradation of Low-Density Polyethylene Preferentially Targets the Amorphous Regions of the Polymer*. Polymers **2024**, 16, 2865.

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About LexMar Global

LexMar Global, a globally operating manufacturer of scientific instrumentation, provides Industrial Magnetic Resonance (IMR) and electrostatic measuring equipment to quality laboratories and manufacturing plants. These techniques have been proven effective in several industries, including petrochemicals—specifically polyolefins—and minerals. The world's leading polymer manufacturers utilize our products every day to improve process efficiency and increase profits. LexMar Global's website can be accessed at www.lexmarglobal.com.