

# Seminari di dottorato

Scienze per l'Ambiente e la Salute & Scienze Chimiche

21 Gennaio 2026, ore 14.30 - 15.30

Università degli Studi di Ferrara  
Dipartimento di Scienze Chimiche,  
Farmaceutiche ed Agrarie  
Via Luigi Borsari, 46 - Ferrara  
Nuovi Istituti Biologici - **Aula Levi**

## Introduction

### **Rana Al Nakib, presenter**

Postdoctoral Researcher

1. Sabancı University, Faculty of Engineering and Natural Sciences, Istanbul, Turkey
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### **Monica Bertoldo - chairperson**

Prof.ssa

### ***Processing-Driven Toughening and Degradability of PLA-PU-DMA Blends: A Comparative Study between Extrusion and Kinetic Mixing for Automotive Applications***

#### **Abstract**

Poly(lactic acid) (PLA) is an appealing biopolymer for interior and semi-structural automotive parts, yet its adoption remains limited by low impact resistance and slow degradation. To address these limitations, a ternary PLA-polyurethane (PU)-dimethyl acrylate (DMA) blend (60-30-10 wt%) was produced and processed using either twin-screw extrusion or kinetic mixing to evaluate the effects of processing on morphology and performance. The material prepared by kinetic mixing showed a substantial increase in toughness, achieving an Izod notched impact strength of 27 kJ/m<sup>2</sup>—more than double that of the extruded counterpart—demonstrating a strong synergistic effect between PU and DMA when finely dispersed. Thermal, structural, and mechanical analyses confirmed the formation of a more



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