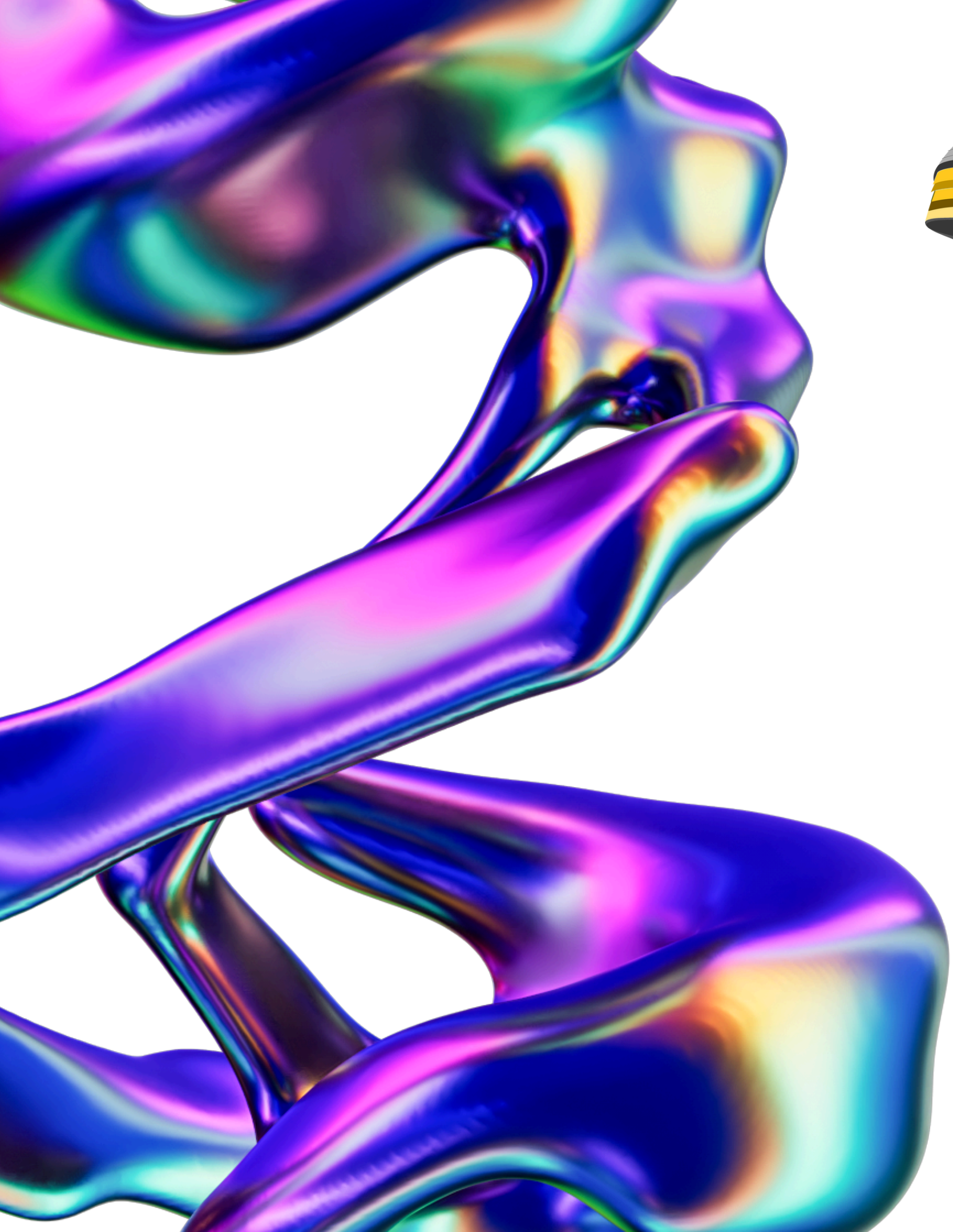


PhD student Alessia Dicesare

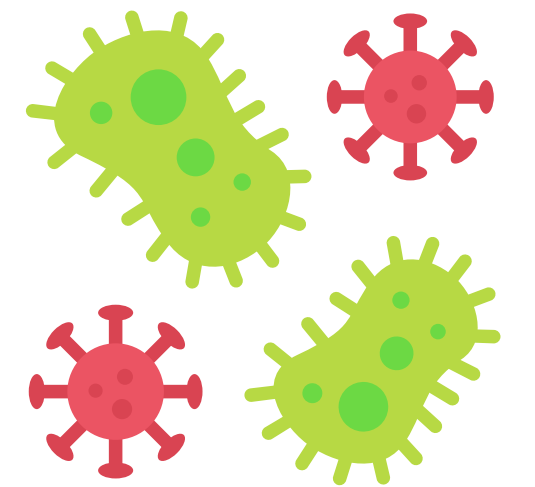
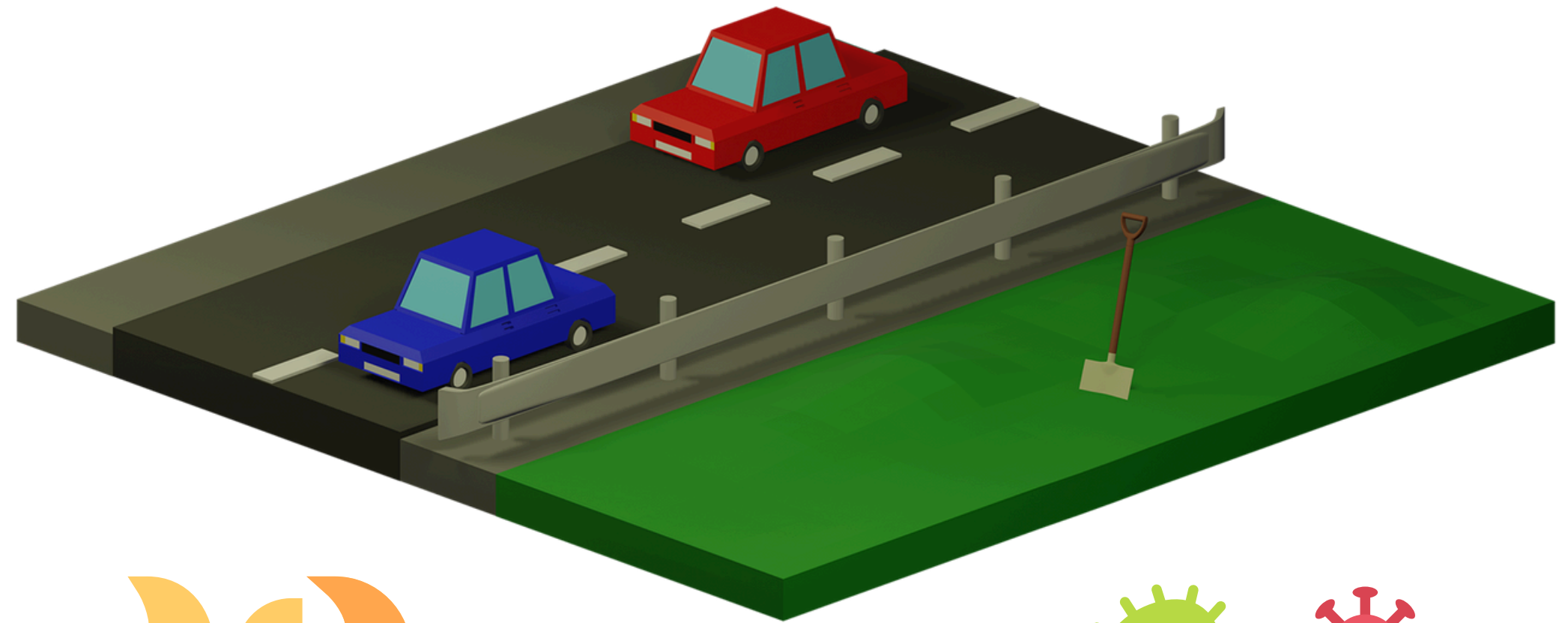


Department of Materials
Science, University of
Milano-Bicocca

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Biotic and Abiotic degradation of rubber compounds: establishing a baseline and assessing the changes on rubber surface and bulk.



Elastomeric polymers

What about regulations?

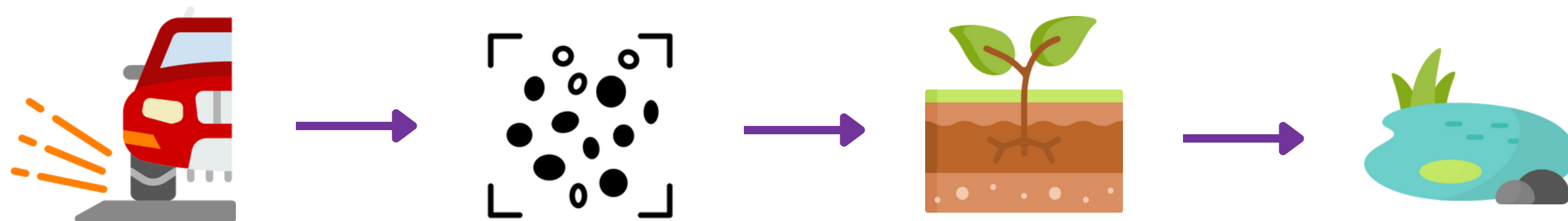
- Research on polymer degradation focused on plastics
- International standards developed for plastics degradation and biodegradability
- Elastomeric polymers (e.g., TRWPs) degradation poorly understood
- No dedicated standards or regulatory guidelines for elastomers



Background

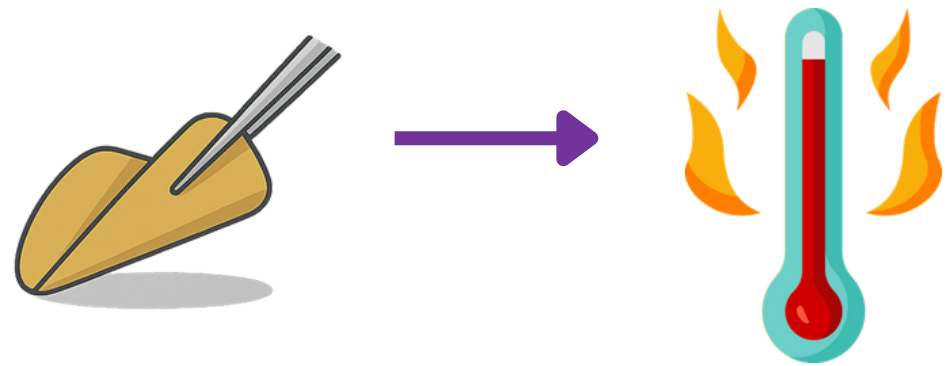
TRWPs origin & dispersion

- The majority of TRWPs accumulate in soil, while a smaller fraction is released into surface waters.
- 66-76% --> **soil**
- 12-20% --> **surface waters**



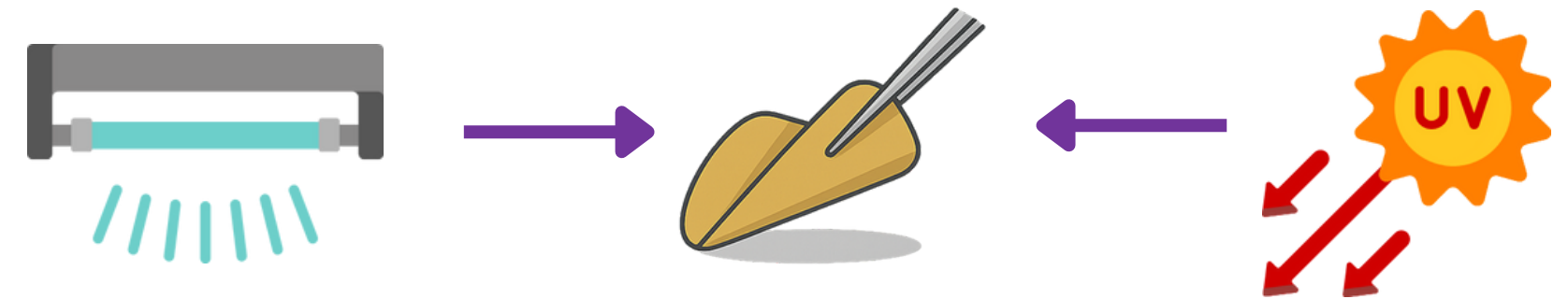
Experimental approach

- Limited knowledge: degradation of **pristine vulcanized rubber compounds**
- Multidisciplinary approach: photo- and biodegradation in **film form**.



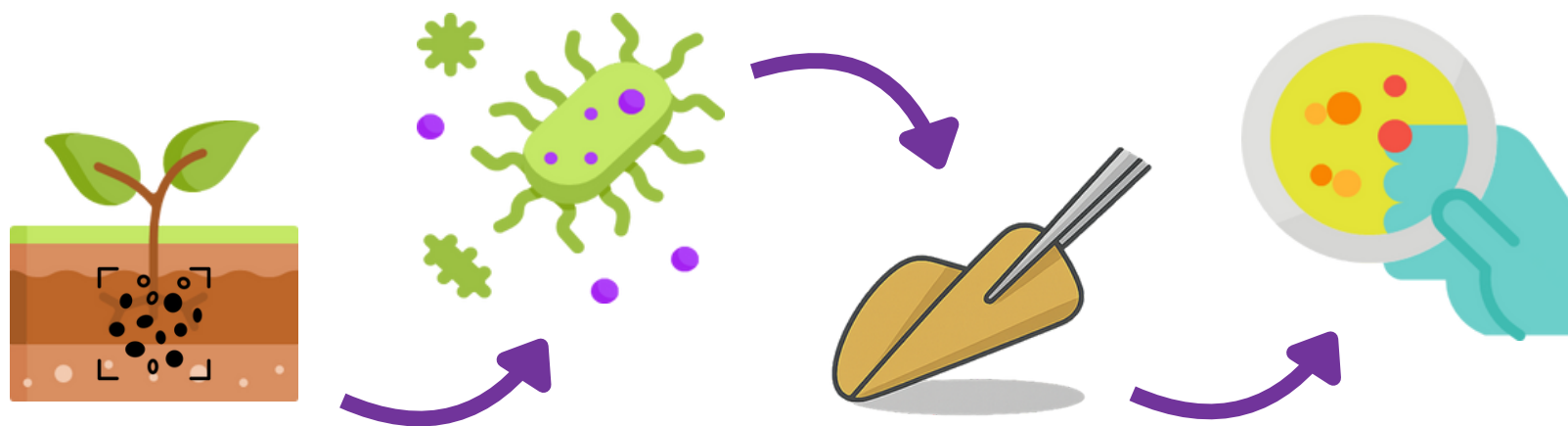
Abiotic degradation

- **Photo-oxidation**: main weathering process for TRWPs
- Goal: Simulate **environmental ageing** of rubber compounds
- Method: **UV** irradiation



Biotic degradation

- Source: **soils** potentially **exposed** to TRWPs
- Method: **enrichment** with **rubber** as sole carbon source
- Outcome: growth of **polymer-degrading microbial consortia**



Bulk & Surface analyses



Py-GC/MS



SEM imaging



Weight-loss
& TGA



FT-ATR
IR



IndBioTechLab & Pirelli teams



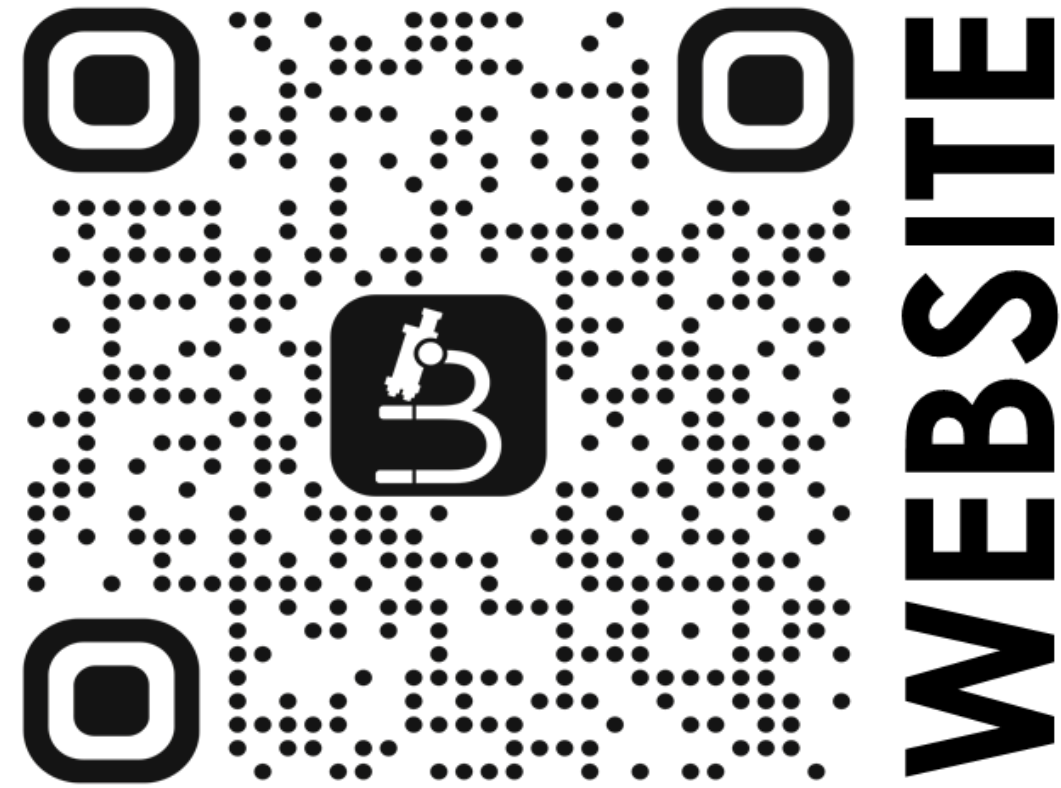
Prof. Valeria Mapelli
Dr. Riccardo Milanese
Dr. Fiorella Masotti
Dr. Pietro Butti
Dr. Mirko Zago
Dr. Vittorio Senatore
Dr. Francesco Catrambone
Dr. Sibashish Bakshi
Dr. Stefano Bertacchi
Sofia Ceccarossi
Francesco Bellusci
Mirko Frigerio
Susanna Perotti
Marta Cucchi
Beatrice Serati
Giovanni Bernardini
Gaia Pilerici
Angela De Lisi
Claudio Dona'

Prof. Paola Branduardi
Dr. Immacolata Serra
Marcella de Divitiis
Martina Dramis

Dr. Daniela Bucchieri
Dr. Luca Giannini
Dr. Silvia Guerra
Dr. Luciano Tadiello



Thank you !



a.dicesare3@campus.unimib.it

Università degli Studi di Milano-Bicocca, P.zza della Scienza, 4 - 20126 Milano, Italy

Tel: +39 0264483439

