

# ***Summary and Outlook – the Final Migratox Year***

SECTION PACKAGING AND RESOURCE MANAGEMENT



### Ames-Test: Results in bacteria-based assay for DNA-reactive genotoxicity

- Mutagenic activity very rare in virgin plastics and food grade recycled PET
- Ames Test uncovers DNA-reactive contaminants in recycled Polyolefins
- Coatings: DNA-reactivity detected at conditions that are sensitive for epoxides

### Cell Culture Tests: Results for Cytotoxicity and Endocrine Activity

- Approx. 20% of Samples estrogen active, but activity in general lower than in Food
- Alarming Studies on Estrogen Activity of PET cannot be confirmed
- Cytotoxicity regularly detected in Coatings, Paper&Board and recycled Plastic
  - But: Cytotoxicity not associated with effects at low concentrations!



**Nestlé** Good food, Good life

## Migratox Board Meeting

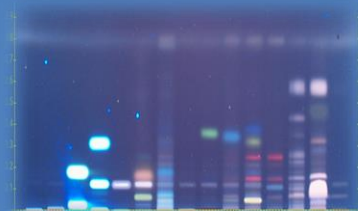
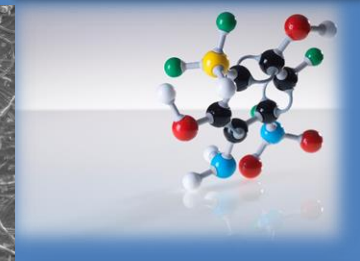
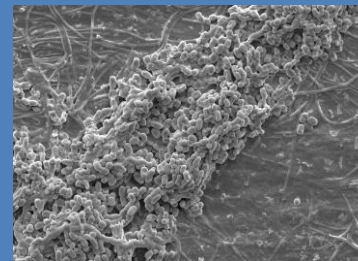
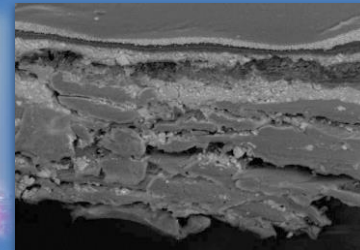
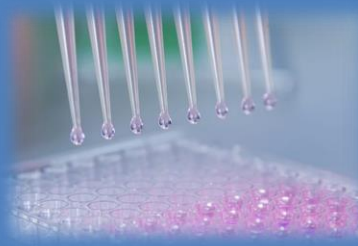
**Integrated multidisciplinary approach  
to support prioritization & packaging  
safety**

**Maricel Marin-Kuan**

Institute of Food Safety & Analytical Sciences

Nestlé Research

Vienna, 6<sup>th</sup> December 2022



# Confirmation Tests – Bernhard Rainer

Code	Type	Ames MPF	HepGenTox	umuc
B2	bioplastic	+	+	+
B3	bioplastic	+	+	+
P2	LDPE	+	+	+
P5	PP	+	-	+
P10	LDPE	+	-	eq
P11	PS	+	+	+
P12	LDPE	+	+	+
P13	HDPE	+	+	+
P14	LDPE	+	+	+
P15	PP	+	-	+
P16	PS	+	-	+
P17	LDPE	+	+	+
P18	PE/PP	+	+	+
P19	LDPE	+	+	+
P20	PP	+	+	+
P21	PS	+	+	+

>Overall Concordance with the Ames Test is high (>76%)

>Positive results could be confirmed with two additional test systems

>umuC – issues with sample turbidity, higher positivity rate

>HepGenTox – slightly lower positivity rate, less issues with toxicity than expected

>Identification (HPLC-MS) still needed

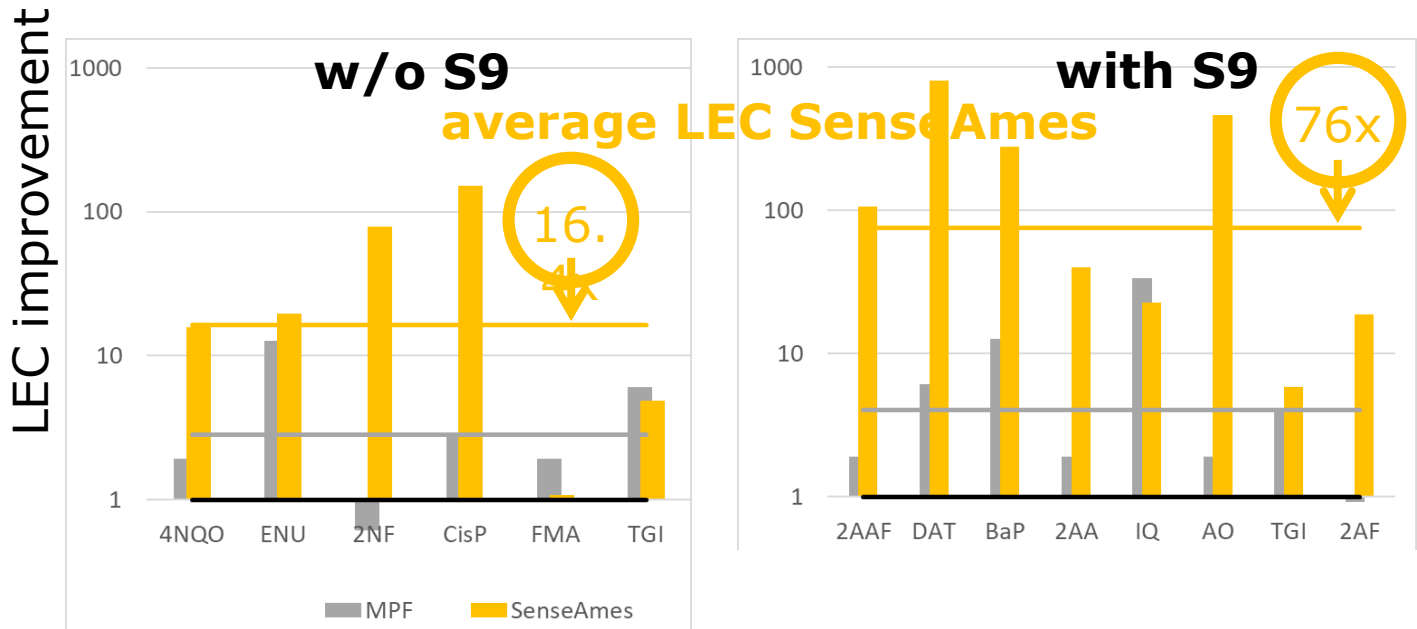
	Ames MPF	HepGenTox	umuc
Positive results	16	12	15
Concordance with Ames	100%	75%	94%

- Some printing inks could be a potential risk factor for mutagenic effects.
- Heating of nitrocellulose induced mutagenic activity - critical for plastic recycling!
- Besides nitrocellulose, printing inks provide additional – so far unknown – sources of mutagenic activity.
- A (small) fraction of mutagenic activity can be explained by primary aromatic amines.
- Most activity remains unexplained and cannot be detected by GC-MS screening.

## **To find source for mutagenic activity:**

Defined printing inks / ink components will be systematically tested!

# Sense Ames – Thomas Czerny



# Upcoming Project – SafeCycle



## Research Partners



## Funding



**Project SafeCycle:**  
Analysis of recyclates and recycling processes and their applicability for different packaging scenarios.

## Associations



cluster niederösterreich



## Industry

Food, Detergents,  
Cosmetics, Packaging,  
Recycling, Waste  
Management. 70+  
companies

Start: 01/2023

End: 12/2024



# Ongoing Research

- > Fractionation of migrate samples
  - > TLC method by FHCW
  - > SPE method by OFI
- > Further development of the Ames Sense
- > Ongoing sample screening
- > Identification attempts
- > Systematic testing of printing ink components





# Migratox Project Status

- >Current project year 5/5
- >4th report undergoing evaluation
- >Final meeting: end of 2023
- >12 months left





**Thank you for your attention!**

**Open Questions?**

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