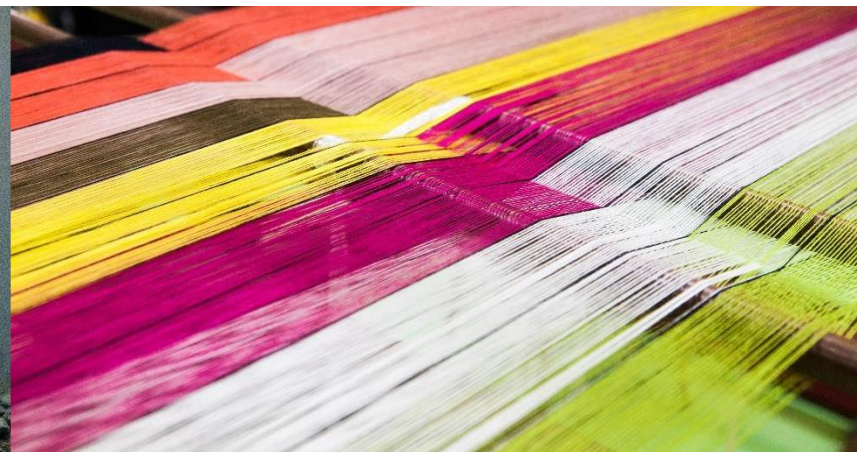


# CURCOL

## *Progress, current state and future work on the optimization of colorants from curcumin*



Kees Kruithof, 20 April 2021

**avans**  
hogeschool

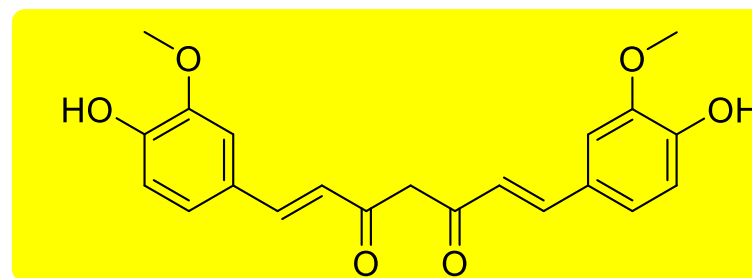


Centre of Expertise  
Biobased Economy



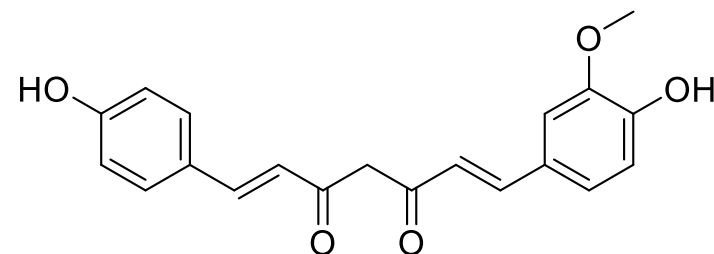
**UNIVERSITY**  
OF APPLIED SCIENCES

# Curcumin from Turmeric (*Curcuma Longa*)

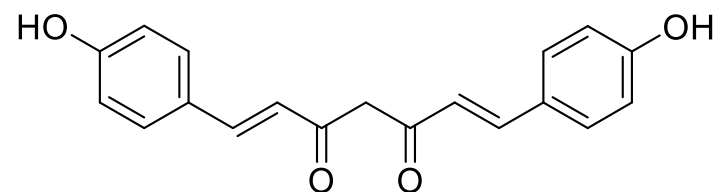


60%

Curcumin



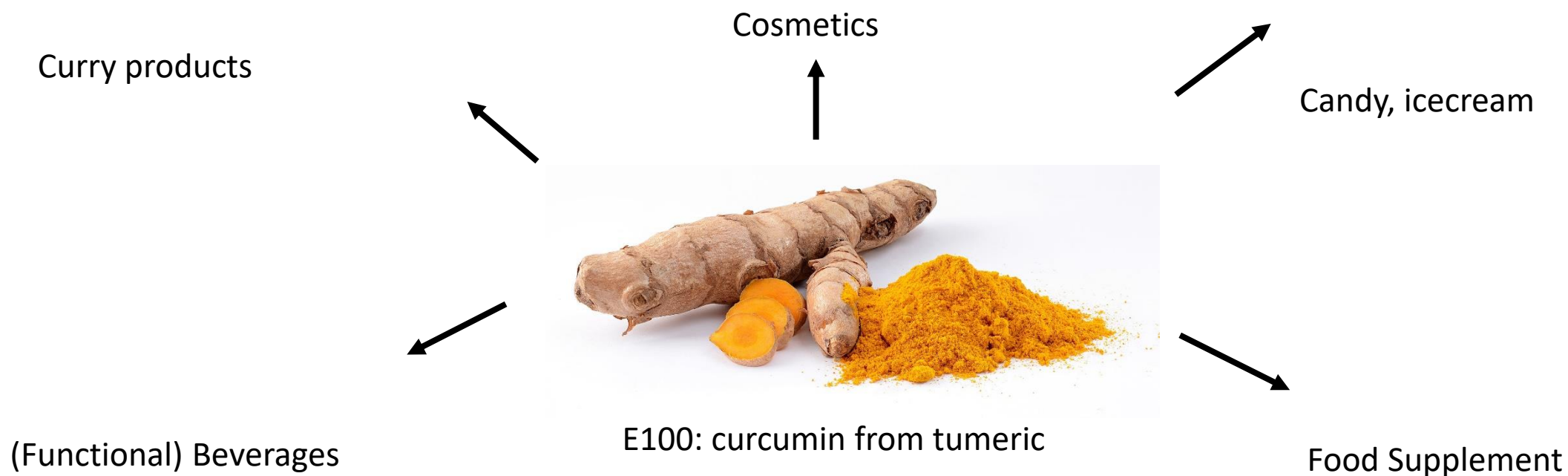
23%



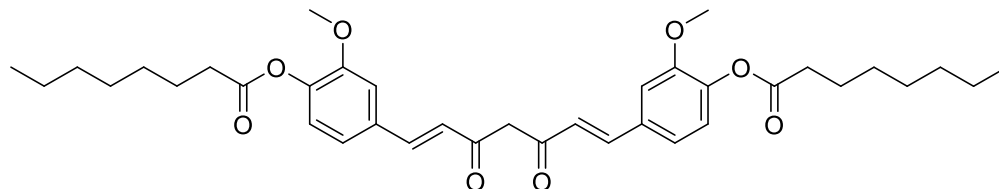
13%

# Applications of Turmeric/Curcumin

*Pictures are removed due to copyright regulations*

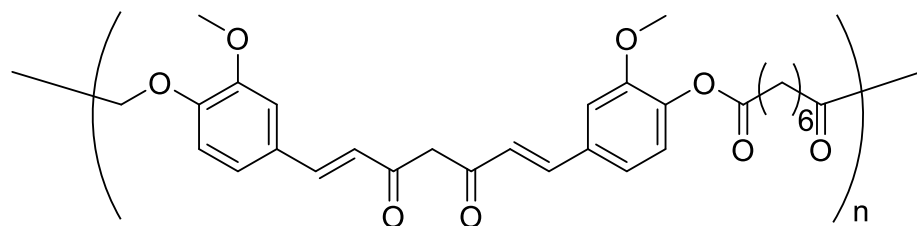


# Applications of curcumin



Curcumin-derived green plasticizer

Saltos *et al.* RSC advances, 2014



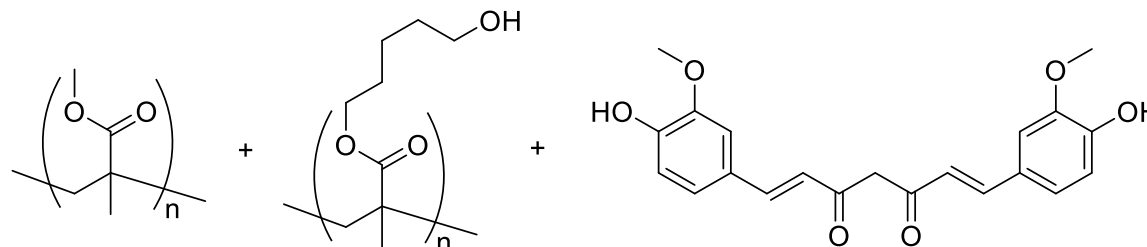
Bio-Based curcumin Polyesters

Matsumi *et al.* Polymer journal, 2008



Film coating of food supplements and pharmaceuticals using curcumin

<https://www.seppic.com>



Curcumin as natural dye in polymer blends

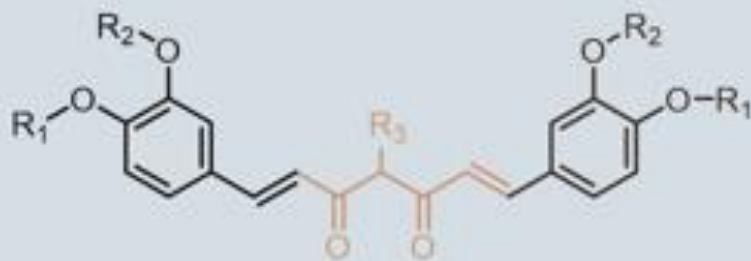
Abidin *et al.* Pigment & Resin Technology, 2013

# CURCOL colorant

- Production of curcumin based colorants.

## New building block for the bio-economy

Key player: **(bio)chemical** industry



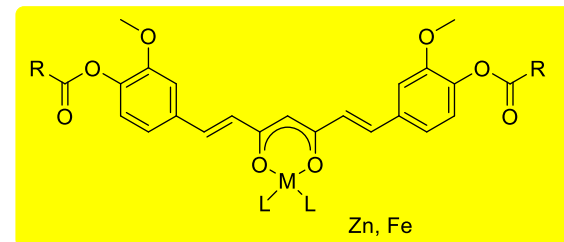
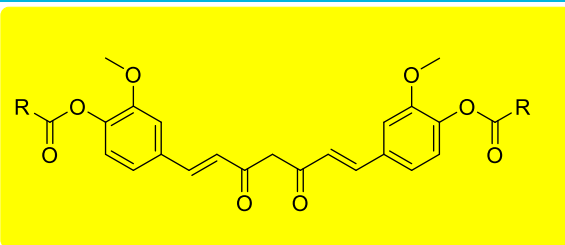
Bio-based & biodegradable **curcumin**

Goal: **create the primary colors** from curcumin (blue, red, yellow)

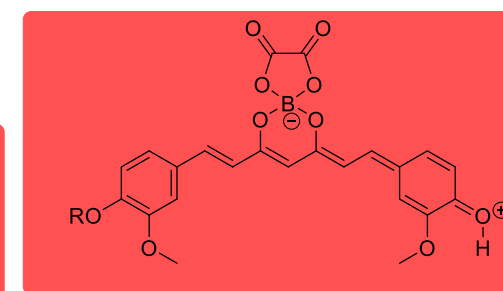
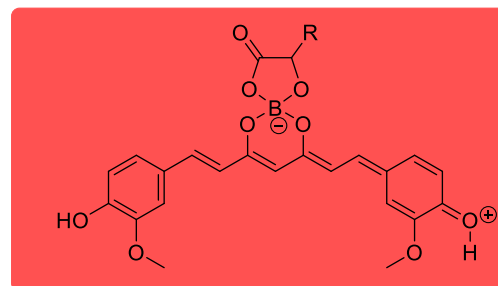
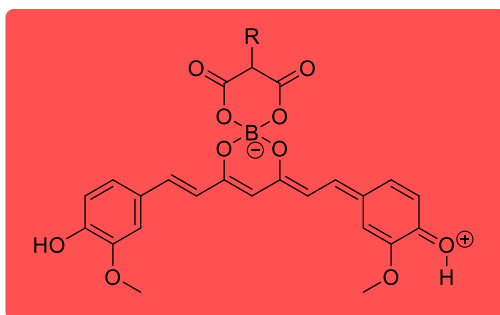
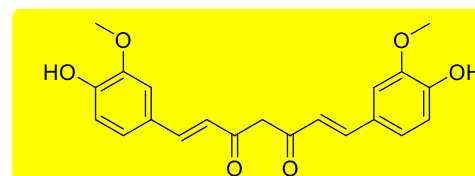
Goal: **transition** of the chemical industry from fossil based to bio-based

Goal: finetune **biodegradability**

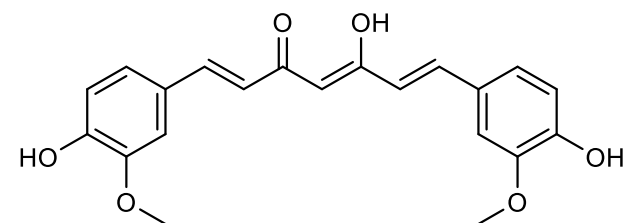




Single step green conversions possible



Rubrocurcumin



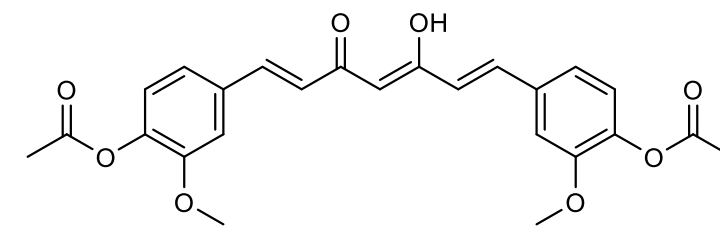
curcumin



Curcumin 1 % (w/w)  
in PLA 4032D

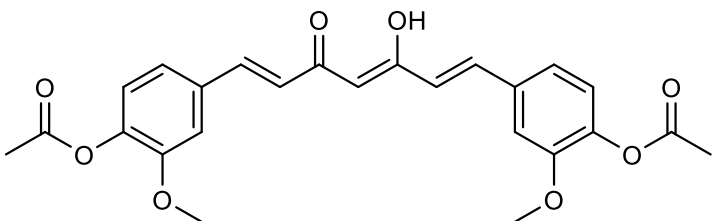


Colorants 1 % (w/w)  
in PLA 4032D



diacetyl curcumin



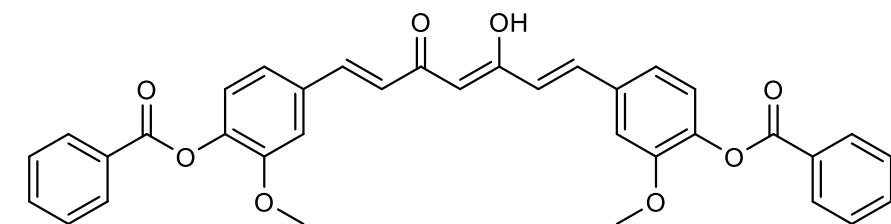


diacetyl curcumin

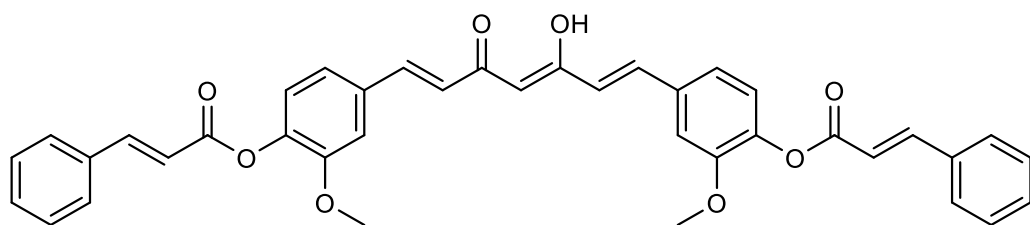
Pure colorants



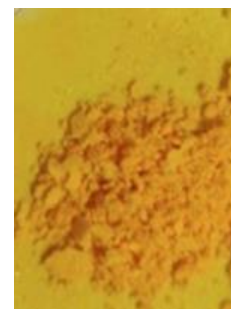
Colorants 1 % (w/w) in PLA 4032D

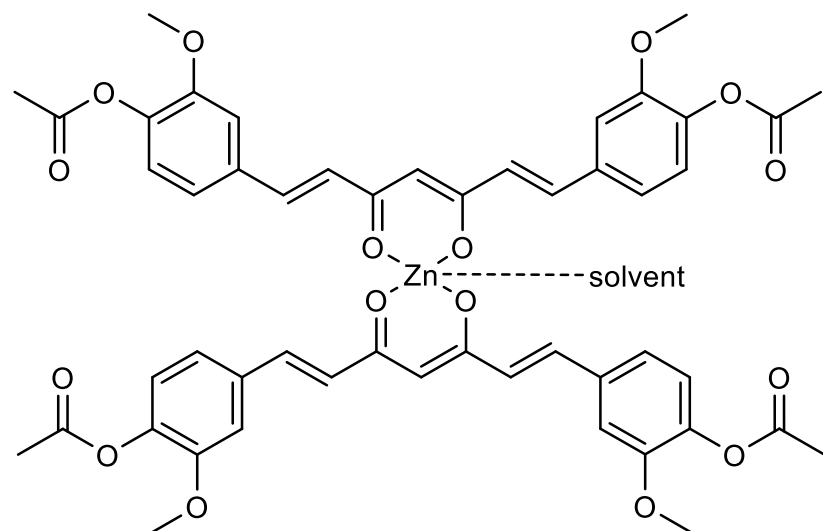


dibenzoyl curcumin



dicinnamyl curcumin



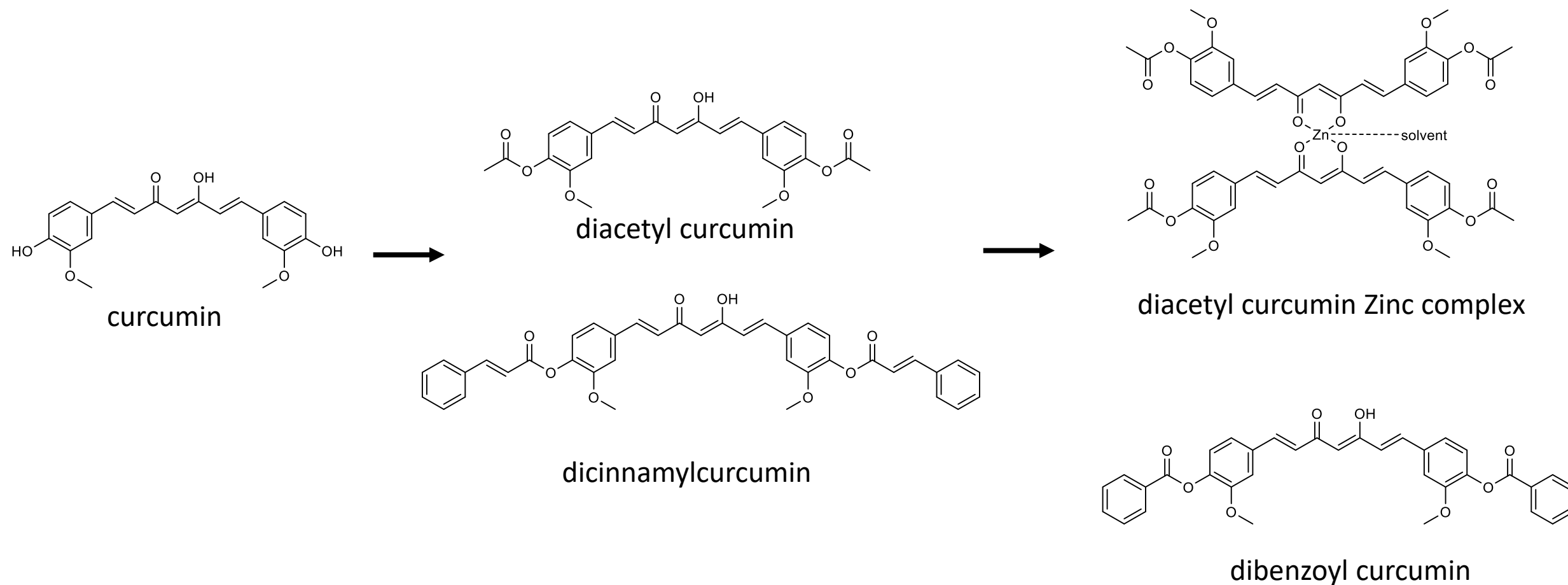


diacetyl curcumin Zinc complex

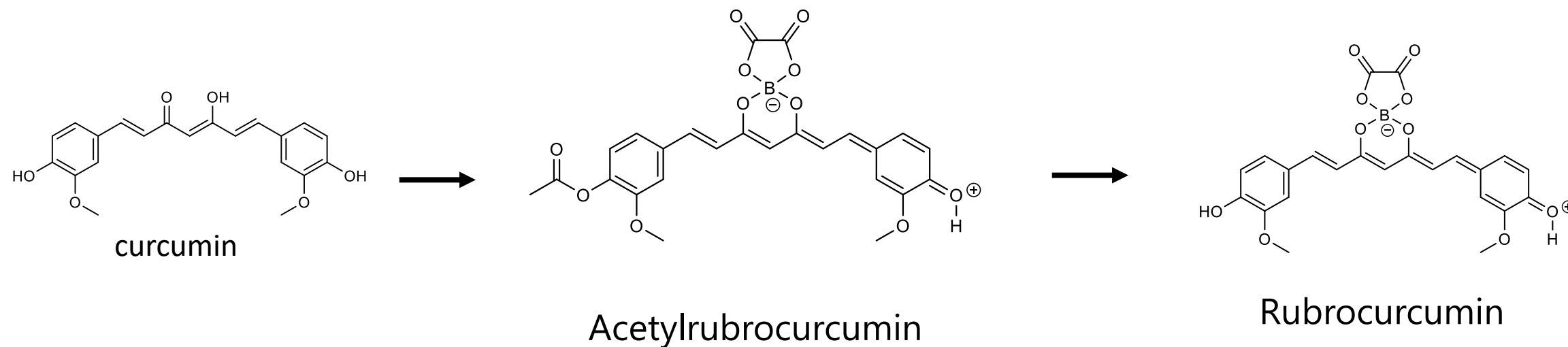


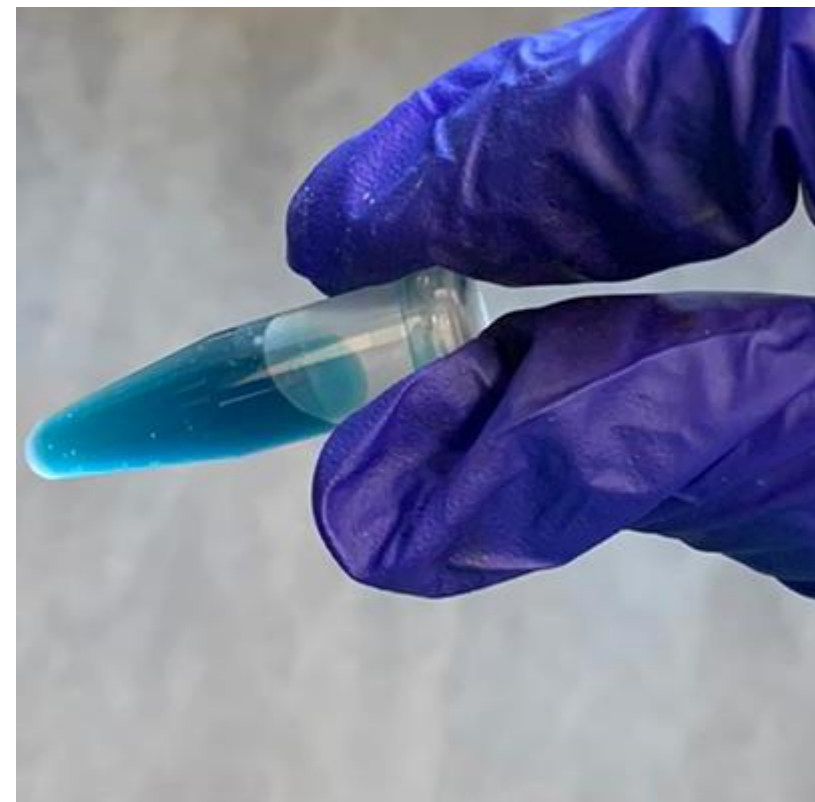
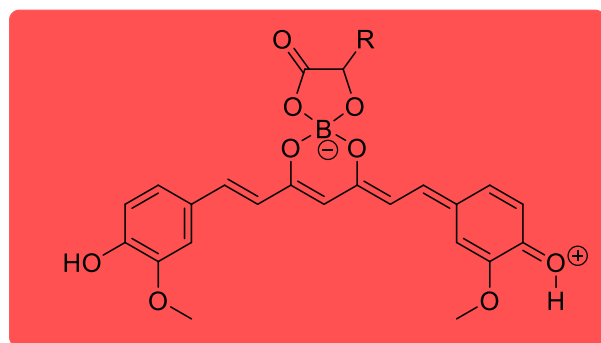


# Lightfastness trends yellows



# Lightfastness trends reds





Blue color is maintained  
36 h in solution

- Optimize extraction of curcumin or curcuminoids
- Produce colorants from Turmeric extracts
- Lightfastness comparison and CIE lab values of colorants & CMBs
- Optimize red and blue/purple curcumin based colorants

## CoE-BBE researchers

- Mike Nuiten
- Eric Mattheussens

## Avans Students (interns)

- Thomas Buisen
- Eva Wouters
- Dirk van de Kerkhof
- Lorenzo de Bie
- Aukje Laurijssen