



Towards the development of a Saccharomyces cerevisiae cell factory to produce the polyphenol curcumin

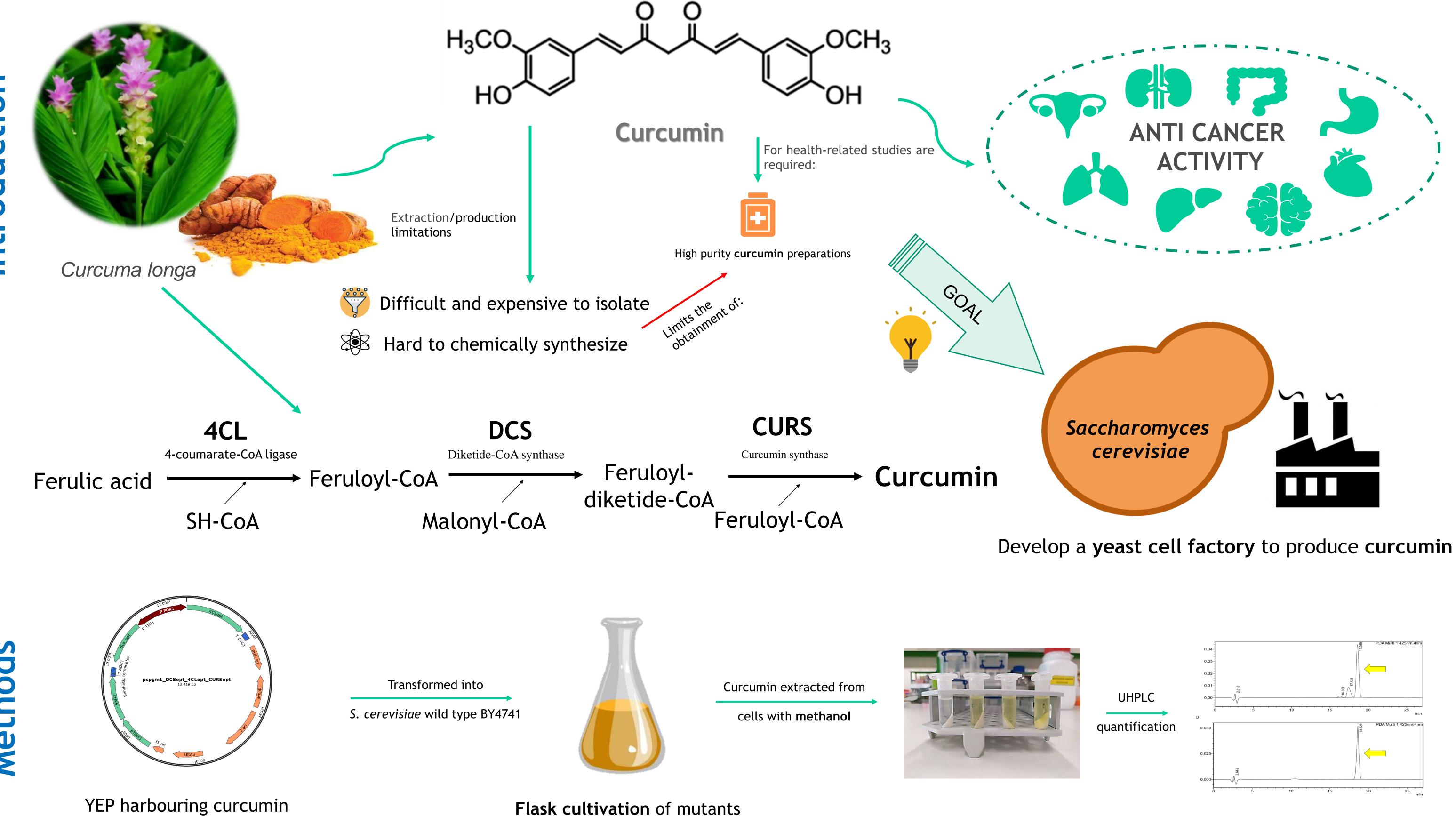
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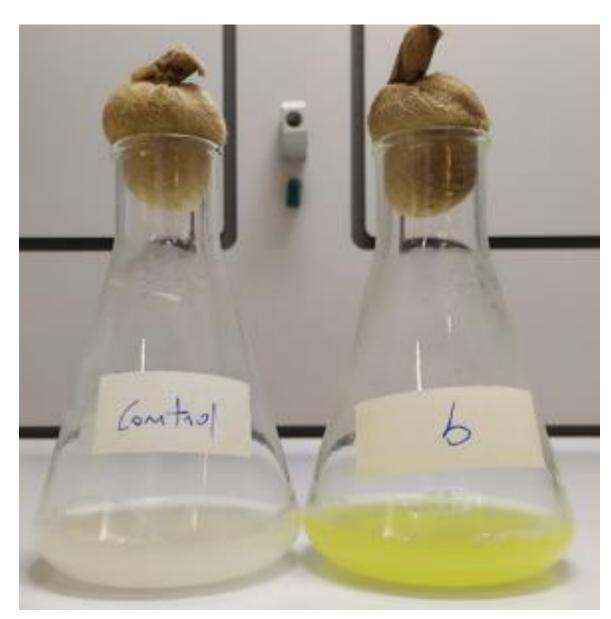
Heterologous pathway combinations tested:

biosynthetic pathway

A - 4CL1 from Arabidopsis thaliana and CUS (curcuminoid synthase) from Oryza sativa (capable of one-pot synthesis of curcumin from feruloyl-CoA)

w/ supplemented ferulic acid

- B 4CL1 from A. thaliana, DCS and CURS from C. longa
- C FerA (feruloyl-CoA synthetase) from *Pseudomonas paucimobilis*, DCS and CURS from C. longa



Left flask: No ferulic acid was added to the culture
media; Right flask: 16 mg/L of ferulic acid were
added to the media at 24 h of fermentation

	Curcumin colony titer (µg/L)					
Name	1	2	3	4	5	Media (σ)
A (↑4CL↑CUS)	78.2	88.8	73.9	87.3	23.0	70.2 (22.1)
B (↑4CL↑DCS↑CURS)	609.1	1067.0	704.3	356.1	173.6	582.5 (279.5)
C (†FerA†DCS†CURS)	1127.3	1413.3	1014.0	1321.3	1248.8	1224.9 (128.7)

- * Engineered S. cerevisiae expressing type III PKS (DCS and CURS) from C. longa produced more curcumin than expressing CUS from O. sativa;
- ❖ FerA from *P. paucimobilis* resulted in more curcumin than 4CL from *A. thaliana*;
- ❖ Our work represents the first report on the production of curcumin in yeast, representing a good basis for the development of a S. cerevisiae cell factory to produce high purity preparations of curcumin



