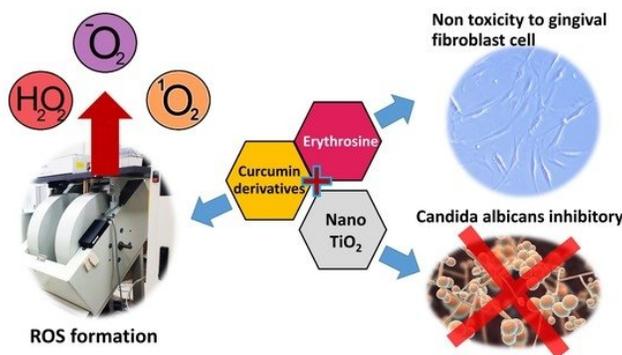


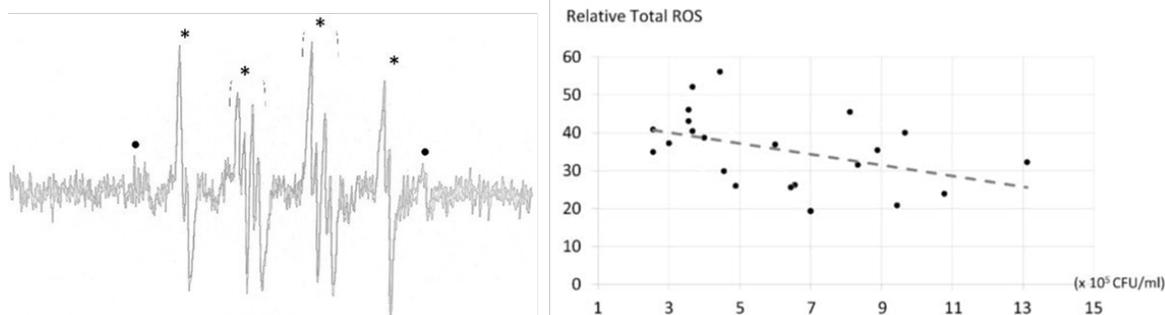
## Reactive oxygen species detection using Electron Paramagnetic Resonance (EPR) Spectroscopy

### Application of EPR in photodynamic therapy on *Candida albicans*

An application of EPR in photodynamic therapy was recently demonstrated by Kanpittaya et al., 2021 using spin trapping technique with 5,5-Dimethyl-1-pyrroline-N-oxide (DMPO). *Candida albicans* is a normal flora but also acts as opportunistic pathogen in the patient with immune-compromised disorder. Photodynamic therapy is a method for treatment of *C. albicans* infection in patients with chronic periodontitis. Here, spin trapping technique was applied to detect hydroxyl and superoxide radicals, and optimize the combination of photosensitizers (erythrosine/curcumin derivative/nano-titanium dioxide) in production of those ROS. The result demonstrated a good correlation between ROS production and *C. albicans* inhibition. Moreover, the best combination of photosensitizers was revealed, i.e. 20  $\mu\text{M}$  bisdemethoxy curcumin/220  $\mu\text{M}$  erythrosine/10% (w/w) nano-titanium dioxide. This optimized combination could be applied in clinical study.



### Graphic abstract demonstrates the concept of research



### EPR spectrum of DMPO adduct of hydroxyl and superoxide radicals and correlation with pathogen inhibition

Reference:

Kanpittaya K, Teerakapong A, Morales NP, Hormdee D, Priprem A, Weera-archakul W, Damrongrungruang T. Inhibitory effects of erythrosine/curcumin derivatives/Nano-Titanium dioxide-mediated photodynamic therapy on *Candida albicans*. *Molecules*, 2021;26:2405.

<https://doi.org/10.3390/molecules26092405>