

## Metabolomic fingerprinting of primed tobacco cells provide the first evidence for the biological origin of cis-chlorogenic acid

Mhlongo MI  
Piater LA  
Steenkamp PA  
Madala NE  
Dubery IA

### ABSTRACT:

Previous studies suggest that only transisomers of chlorogenic acid (CGA) are naturally produced. Cis-isomers have been noted in some plant tissues exposed to different mechanical processes as well as untreated tobacco leaves exposed to sunlight. Very little, however, is known about the biological significance and origin of cis-isomers. Here we show for the first time the accumulation of cis-5-caffeoylquinic acid in cultured tobacco cells treated with different inducers of plant defence (lipopolysaccharides, flagellin peptide-22, chitosan, acibenzolar-Smethyl and isonitrosoacetophenone), without exposure to UV light and with a 2-fold (on average) increase in the concentration of the pool in comparison to non-stimulated cells. Our UHPLC–Q-TOF-MS and multivariate statistical results suggest the presence of a possible biological pathway responsible for the production of cis-CGAs in tobacco plants.