Patholux 2012 – CRP Gabriel Lippmann
Impact of plant pathogens on the quality of crop and wine

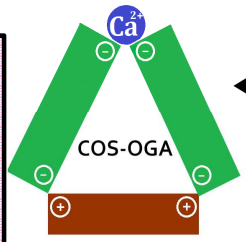
The COS-OGA oligosaccharidic elicitor - from basic research to plant protection.

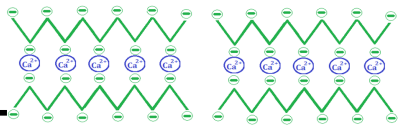
G. van Aubel [1], R. Buonatesta [2] and P. Van Cutsem [1]

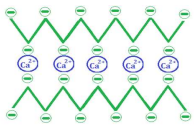
(1) Unité de Recherche en Biologie Cellulaire Végétale, Université de Namur, Rue de Bruxelles 61, B-5000 Namur, Belgium
vanaubeg@fundp.ac.be; pierre.vancutsem@fundp.ac.be
(2) FytoFend SA, Rue Phocas Lejeune 25-6, B-5032 Isnes, Belgium, r.buonatesta@fytofend.com

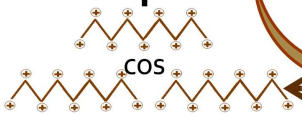
Level 1: COS-OGA elicitor composition was inspired by natural plant-fungus interactions

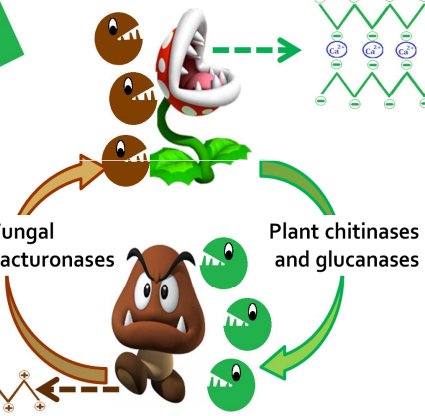
Chitosan oligosaccharides (*COS*) bind and stabilize the so-called egg box conformation of polyanionic oligopectates (***OGA***) (Cabrera et al., Glycobiology, 2010).





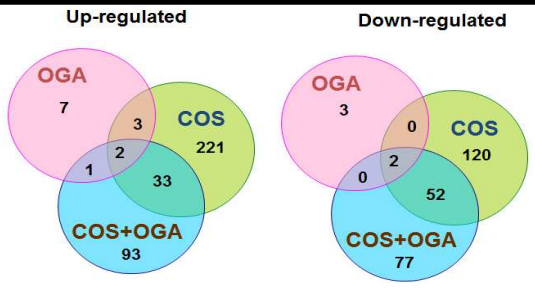




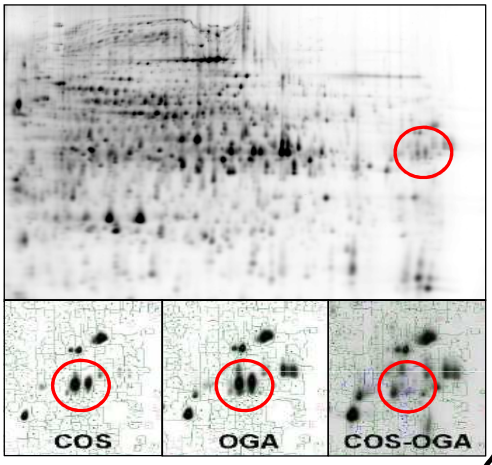


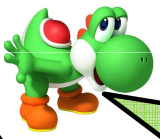
Indeed, upon plant penetration, fungi deacetylate their wall chitin into positively charged chitosan to escape plant chitin receptors. Chitosan fragmentation by plant enzymes yields ***COS***, a polycationic molecule. Plant cell walls degradation by fungal enzymes gives oligogalacturonates (*OGA*) able to form egg boxes in presence of calcium.

Level 2: COS, OGA and COS-OGA effects were assayed on Arabidopsis



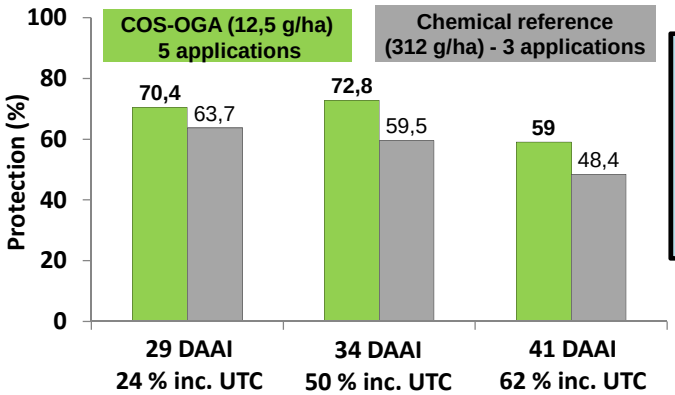
Distribution of transcripts significantly regulated (p<0.05, at least 3.0-fold expression cut-off)





Arabidopsis cell suspensions were treated with *COS*, *OGA* or *COS-OGA*. Microarray and proteomic studies showed that proteins and genes involved in defence processes were differently regulated, indicating a synergistic mechanism of response to *COS-OGA*.

Level 3: COS-OGA protection was demonstrated in greenhouse trial



Efficacy trial on cucumber challenged by powdery mildew (*Sphaerotheca fuliginea*).

COS-OGA protection was even slightly higher than the chemical reference.

DAA1 = Days after application n°1, % inc. UTC = disease incidence in the untreated control