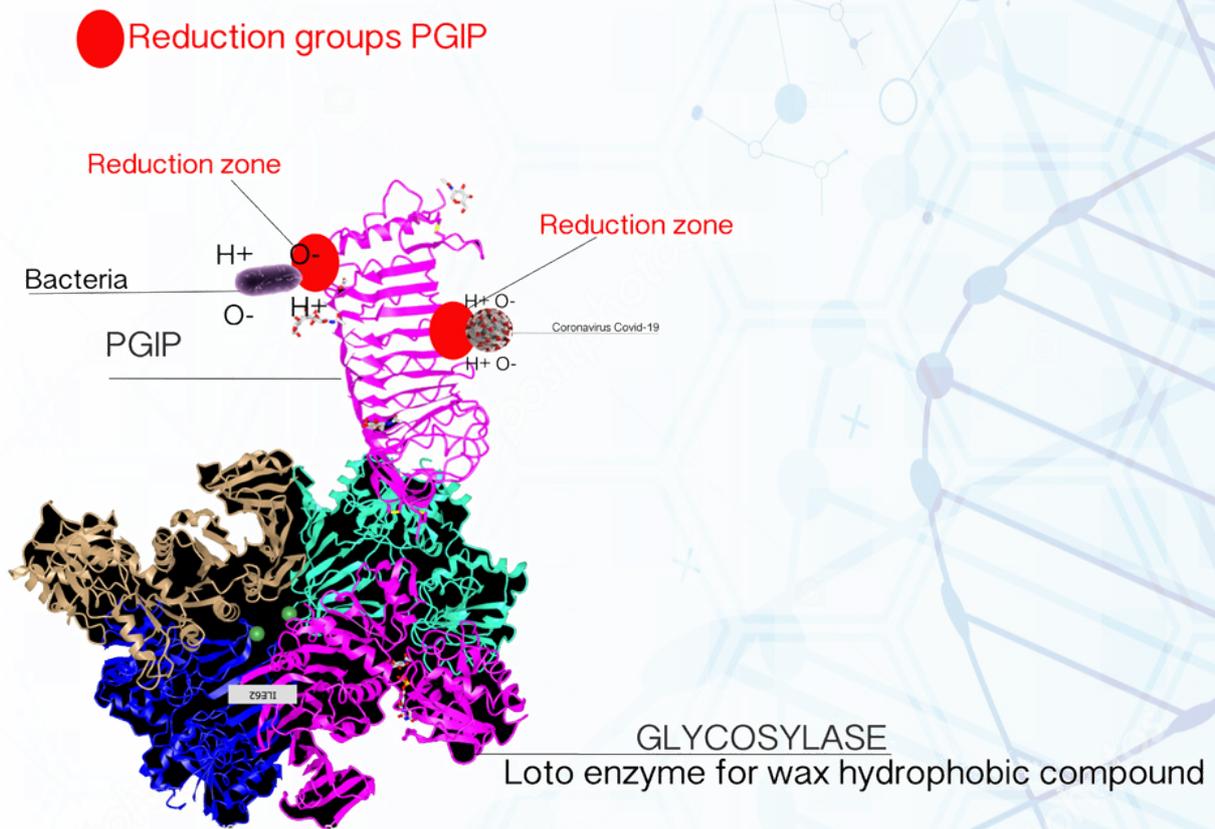


SCIENTIFIC DESCRIPTION

Polygalacturonase-inhibiting protein (PGIP), it's a leucine-rich repeat protein involved in ambient defense.

Pic.1 - Fusion protein Bellerofast



Polygalacturonase-inhibiting proteins PGIP are structural plant cell wall components that belong to the superfamily of leucine-zipper protein [1]. That proteins protect plants from fungal, viral and bacterial invasion. They interact with inner several proteins belonging to the cytoplasm environment, PGIP's are class of proteins specialized for protein-protein response especially with endo-poly-galacturonases or other enzymes causing a PGIP and microorganism interactions with the cell wall of plants.



By means of inhibition of the enzymatic action deriving from microorganism, and the possibility to accumulate many PGIP's in the site of injury plant organize their defense.

The extra-cytoplasmic type PGIP's another class of these proteins are homologous to the previous cited, plays a crucial role in development, of a kind of defense that could be used by cloning, the biotech field.

The PGIP structure is characterized by the presence of two receptor kinases in and reveals a negatively charged surface on inserts on the LRR (leucine rich region) at the concave face, likely involved in binding external substances.

Thanks to a negative pocket corresponding the LRR, we observe a hydrophobic region including two receptors capable to reduce everything is in touch by the action of an oxidoreductase reaction.

The majority of microorganism, bacteria fungi and virus need to have a breach in epithelial barrier to gain access to tissues producing damages. Using PGIP's by cloning this is avoid only when PIGIP is in touch of microorganism.

Nelumbo nucifera is the scientific name of the lotus plant, the leaves of this vegetal are coated by a special type of wax, a tetrameric glycoprotein with four hydrophobic regions responsible of the so called "lotus effect". By lotus effect [2] we mean a property of the leaves and flowers of *Nelumbo nucifera*: they are highly super hydrophobicity, so much so that everything is slippery. Using a molecular biology technique, by a bait protein expressed as a fusion using To make a GAL4 DNA-BD/bait construct, by pGBKT7, plasmid. the fusion result, it's the innovation.

Experimental tests were conducted during 3 years and led to convincing results: any time a mould or a gram-positive bacteria - which is significantly more resistant than a virus - got in contact with leucine's reduction region, it was successfully destroyed. Experiments' repetitions showed that each molecule can neutralise up to 4 microorganisms, proving the highly effective prevention action.

[1] Raviraj M. Kalunke¹ et al. - An update on polygalacturonase-inhibiting protein (PGIP), a leucine-rich repeat protein that protects crop plants against pathogens - Plant Sci., 20 March 2015

[2] Hans J. Ensikat et al. - Superhydrophobicity in perfection: the outstanding properties of the lotus leaf - Beilstein J. Nanotechnol. 2011