Martin Rinaldi-Tosi et al., J Biotechnol Biomater 2016, 6:5(Suppl)
http://dx.doi.org/10.4172/2155-952X.C1.059

Development of diagnostic platforms using gold nanoparticles for early detection of *Xanthomonas arborícola juglandis* responsible of apical necrosis in walnuts

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Xanthomonas arborícola juglandis is the main causative microorganism of brown apical necrosis in walnuts (*Juglans regia L.*), in addition to secondary fungal pathogens such as *Fusarium* and *Alternaria* species. This pathology is responsible of premature drop fruit and economic losses of over 70% were detected in 2012 in Rio Negro valley. This study aims to develop methods that allow early diagnosis anticipate infection by microorganisms and act quickly. For this, gold nanoparticles were synthesized by chemical reduction using tetrachloroauric acid and sodium citrate, and functionalized with chitosan. Nanoparticles (NPs Au-CH) were subsequently characterized by several techniques. The results of UV-visible spectroscopy tests showed a characteristic band at 530 nm; studies of scanning electron microscopy (SEM) showed homogeneous and spherical morphology and particles size of 15±5 nm; energy dispersive spectrometry (EDS) assay showed a characteristic spectrum of 2 keV and X-ray fluorescence (XRF) with characteristic peaks between 37° and 38°. Finally, *Xanthomonas arboricola* antibodies were immobilized on the NPs Au-CH surface using glutaraldehyde, obtaining as result a nanostructured platform for the development of an immunosensor for early detection of this microorganism. We concluded that the nanostructured platform can be used to attach different specific biomolecules that recognize microorganisms responsible for apical necrosis and thus make early detection before physical manifestation of the symptomatology occur.

Biography

Martin Rinaldi-Tosi is working as a Professor at the National University of Río Negro, Argentina. He won many awards and recognitions for his work. His international experience includes various programs, contributions and participation in different countries for diverse fields of study. His research interests reflect in his wide range of publications in various national and international journals. He is the Editorial Board Member and reviewer of scientific journals.

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