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Biogenic Silver Nanoparticles as Potential Agent against Mycobacterium Tuberculosis

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Abstract: ***Purpose: Numerous species of mycobacterium caused chronic contagious disease known as Tuberculosis. Owing to multi-drug resistant strains of mycobacterium and number of people infected with tuberculosis increasing worldwide and mostly acquired in patient who have acquired human immunodeficiency syndrome (AIDS). To overcome this situation and replace currently used medicine, there is an urgent need for new effective agents [1]. In present state, Nanoparticles have opened new opportunity in medicine, diagnosis, and therapeutics [2].***

In sight of this, the present study was undertaken to synthesize biogenic silver nanoparticles using and to test their efficiency against the growth of Mycobacterium tuberculosis.

Methods: Silver nanoparticles synthesis using Sesbania grandiflora flower extracts. Characterized by UV-Vis spectroscopy, Zeta potential, DLS and TEM analysis. Anti mycobacterium activity determine by L.J Slope method against Mycobacterium tuberculosis H37 RV strain [3]. The strains were procured from Institute of Microbial Technology, Chandigarh.

Results: The UV–visible data reveal that an absorbance peak in between 400nm to 421 nm confirms formation of silver nanoparticles with zeta potential is -19.65 mV and they are spherical in shape with sizes between 20 nm and 56 nm.These nanoparticles control the growth of M. tuberculosis H37 RV strain at 12.5 ug/mL

Conclusion: synthesis of biogenic silver nanoparticles is green, eco friendly and inexpensive technology. In present study based on results we conclude that aqueous extracts of flower of can be used for synthesis of Silver nanoparticle and these nanoparticles shows antimycobacterial activity and this was confirmed by L.J Slop method. Thus, the potential of biogenic silver nanoparticles further investigate with other screening methods as well as on animal modelling for developed novel TB nanomedicine.

Keywords: Silver nanoparticles, Sesbania grandiflora, Tuberculosis

I. INTRODUCTION

Tuberculosis is most common a chronic contagious disease and is a key cause of morbidity and mortalityin developing countries. In majority cases people recover from primary TB infection without spread evidence of the disease, the infection may reside for years in dormant form and in more or less cases it can be reactive [4]. Conversely, multidrug-resistant (MDR)-TB and extensively drug-resistant (XDR)-TB needs second-line anti-TB drugs treatment, which are more expensive and have greater toxicity as well as side effects. Owing to this multi-drug resistant (MDR) and extensively-drug resistant (XDR) strains of *M. Tuber culosis* appeared in all over the world together with India[5]. As result there is development of resistance to conventional antibiotics threatens the growth made in TB control worldwide, emerging the need of alternative approaches, one of which may be nonmaterial.

Recently, green synthesis method like materialization of metal nanoparticles, especially silver, have drawn the attention because of wide-ranging application in drug designing as well as easy synthesis, controlled morphology, upscale production and reduced cost with increased sensitivity and specificity constitute an interesting alternative. As nanoparticles preparation by green synthesis are safe, less toxic and eco-friendly compared with chemically synthesised nanoparticles [6].

Sesbaniagrandiflorais an Indian medicinal plant commonly known as Agathi. S. Grandiflora flower contain oleanolic acid and its methyl ester and kaemfero l-3-rutinoside as active ingredients. S. grandiflorahas been known to have anti ulcerogenicactivit, antioxidant, anti cancer, anti microbial activity [7].

So, in recreation of developing alternate and novel antituberculant agents, we have focused our efforts to screen nanoparticles, synthesised through Sesbania grandiflora flower extracts for their feasibility as anti mycobacterial agents (Figure. I).