Journal of Microbiology and Immunology

Abstract

Biosynthesis of silver nanoparticles using Sphingobium sp. MAH-11T and their antibacterial activity and mechanisms investigation against pathogenic microbes.

Md. Amdadul Huq[1], Shahina Akter[2]

[1]Department of Food and Nutrition, College of Biotechnology and Natural Resource, Chung-Ang University, Anseong-si, Gyeonggi-do, 17546, Republic of Korea

[2]Department of Food Science and Biotechnology, College of BioNano Technology, Gachon, University, Seongnam, 461-701, Republic of Korea.

Abstract:

The present study highlights the biological synthesis of AgNPs using Sphingobium sp. MAH-

11 and also their antibacterial mechanisms against drug resistant pathogenic microorganisms. The nanoparticle synthesis method used in this study was reliable, facile, rapid, cost effective and ecofriendly. The AgNPs exhibited highest absorbance at 423 nm. The TEM image revealed spherical shape of AgNPs and the size of synthesized silver nanoparticles was 7 to 22 nm. The SAED pattern and XRD spectrum revealed the crystalline structure of AgNPs. The results of FTIR analysis revealed the functional groups responsible for the reduction of silver ion to metal nanoparticles. The biosynthesized AgNPs showed strong anti-microbial activity against drug resistant pathogenic microorganisms. Moreover, E. coli and S. aureus were used to explore the antibacterial mechanisms of biosynthesized AgNPs. Minimal inhibitory concentrations (MICs) of E. coli and S. aureus were 6.25 µg/mL and 50 µg/mL, respectively and the minimum bactericidal concentrations (MBCs) of E. coli and S. aureus were 25 µg/mL and 100 µg/mL, respectively. Results indicated that the AgNPs caused morphological alterations and damaged the membrane integrity of strains E. coli and S. aureus. The AgNPs synthesized by Sphingobium sp. MAH-11 may serve as a potent antimicrobial agent for many therapeutic applications.

Biography:

I am Md. Amdadul Huq, native of Bangladesh. Now, I am working as Assistant Professor, Dept. of Food and Nutrition, Chung-Ang University, Anseong, Republic of Korea. Here I briefly mention my biography.

Recent Publications:

1. Md. Amdadul Huq, et al; Burkholderia ginsengiterrae sp. nov. and Burkholderia panaciterrae sp. nov., antagonistic bacteria against root rot pathogen Cylindrocarpon destructans, isolated from ginseng soil; 2015
2. Md. Amdadul Huq, et al; Structural investigation of ginsenoside Rf with PPAR major transcriptional factor of adipogenesis and its impact on adipocyte; 2015
3. Md. Amdadul Huq, et al; Identification of functional SNPs in genes and their effects on plant phenotypes; 2016
4. Md. Amdadul Huq, et al; Effect of fermented red ginseng extract enriched in ginsenoside Rg3 on the differentiation and mineralization of preosteoblastic MC3T3-E1 cells; 2015
5. Md. Amdadul Huq, et al; Paenibacillus ginsengiterrae sp. nov., a ginsenoside-hydrolyzing bacteria isolated from soil of ginseng field, 2015

World Microbiology Summit; April 24, 2020; London, UK

Citation: Md. Amdadul Huq; Biosynthesis of silver nanoparticles using Sphingobium sp. MAH-11T and their antibacterial activity and mechanisms investigation against pathogenic microbes; Microbiology 2020; April 24, 2020; London, UK