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Efficient biosynthesis of silver nanoparticles using *Aeromonas dhakensis* and their antibacterial activity against ESBLs producing waterborne pathogens

Aftab Hossain Mondal, Insha Sultan and Qazi Mohd Rizwanul Haq
Jamia Millia Islamia, India

The development of a reliable biological process for the synthesis of metal nanoparticles is an emerging field of nanotechnology research. Metal nanoparticles exhibit wide range of applications in diverse branches of science and technology due to their unique properties as compared to bulk counterpart. In the present study, biosynthesis of silver nanoparticles (AgNPs) was achieved using cell free culture supernatant of bacterial strain *Aeromonas dhakensis* AS3. The brown color appearance of solution due to the Surface Plasmon Resonance (SPR) and absorption maxima centered at 405 nm indicates formation of AgNPs. Fourier transform infrared spectroscopy (FTIR) analysis revealed the association of protein with AgNPs and X-ray Diffraction (XRD) spectrum showed crystallinity of silver. Spherical particles with an average size of 5 nm were observed in Transmission Electron Microscopy (TEM) and Atomic Force Microscopy (AFM). Silver nanoparticles (AgNPs) synthesized in this study are eco-friendly and showed significant antibacterial activity against ESBLs producing waterborne pathogens.

aftabmicro@gmail.com

Molecular screening of *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, *Mycoplasma genitalium* and *Ureaplasma urealyticum* infection with infertility patients in north India

Amit Roy, Rakesh Yadav, Rajneesh Dadwal, Anuradha Chakraborti, L K Dhaliwal, Shivaprakash M Rudramurthy, Shalini Gainer and Sunil Sethi
Post Graduate Institute of Medical Education and Research, India

Infertility in female is one of the most important sequelae of sexually transmitted infections (STIs). *Neisseria gonorrhoeae* and *Chlamydia trachomatis* are the predominant agents causing infertility. Pathogenesis of *Mycoplasma genitalium* and *Ureaplasma urealyticum* remain to be addressed. Asymptomatic carrier is serious epidemiological problem because of unconscious infection to sexual or perinatal transmission. Therefore accurate and timely diagnosis is essential for treatment to prevent transmission and infertility. Advantage of real-time PCR (RTPCR) is to combine detection and quantitation simultaneously. The aim of study was to screen *N. gonorrhoeae*, *C. trachomatis*, *M. genitalium* and *U. urealyticum* in infertile and healthy women. 248 women (98 infertile and 150 healthy) attending the gynaecology clinics were included in the study after excluding other causes of infertility. ECS and endometrium tissue were tested by RTPCR using gene PorA of *N. gonorrhoeae*, cryptic plasmid of *C. trachomatis*, MgPa of *M. genitalium* and urease of *U. urealyticum*. Sequencing was done on these specimens that were positive by RTPCR to confirm the results. Of 98 infertile patients, the prevalence of *N. gonorrhoeae*, *C. trachomatis*, *M. genitalium* and *U. urealyticum* were 8.1%, 10.2%, 7.1% and 46.9% respectively. Significantly, PID and BOH were associated with infertility. Co-infections have been found in 1% to 5% among the organisms. Of 150 healthy women prevalence of *M. genitalium* and *U. urealyticum* were 5.3% and 14% respectively. ECS was found to be sensitive specimen. Therefore RTPCR in ECS could be helpful for diagnosis and screening in reproductive age group. These findings may be useful to guide therapy, prevent transmission and infertility.

amitroy.micro@gmail.com