



Preface

Preface to nanotechnology special issue of journal of microbiological methods



This Special Issue of *Journal of Microbiological Methods* celebrates the enormous amount of research currently being undertaken in the field of Nanotechnology as applied to Microbiology with 6 review articles and 17 research papers. This is further exemplified by volume 46 of the Elsevier book series *Methods in Microbiology* on Nanotechnology published in 2019 and edited by the same editors (Gurtler, Ball and Soni) as this Special Issue of *Journal of Microbiological Methods*.

The Review Articles and Research Articles are within the following diverse areas of Nanotechnology in Microbiology: (i) Nanoparticles, (ii) Antibiotics, (iii) Antibiotic Nanoparticles, (iv) Synthesis of Antibiotics, (v) Nanoparticles for Immunoassays, (vi) Microbial Detection Methods, (vii) Liposomes and (viii) Immobilizing Matrices.

In Section (i) on Nanoparticles there are Reviews on Lipid-polymer hybrids (Dave et al., 2019); Bacterial synthesis of noble metal nanoparticles (Ali et al., 2019); Algae-based metallic nanoparticles (Khanna et al., 2019); a Research Article on the synthesis of silver nanoparticles (Husain et al., 2019) and a Research Article on the green synthesis of copper nanoparticles (Sharma et al., 2019).

In Section (ii) on Antibiotics there are reviews on maleic anhydride antimicrobial polymers (Nagaraja et al., 2019); and bioactive prebiotics (Ashwini et al., 2019); and a Research Article on Silver and Zinc bacteriocides (Baker et al., 2019).

In Section (iii) on Antibiotic Nanoparticles there is a review on the use of nanoparticles to control microbial infections (Das, n.d.); a Research Article on antifungal effects of PLGA-nanoparticles (Alhowyan et al., 2019); a Research Article antiprotozoal activity of Ag nanoparticles (Farghali, n.d.); a Research Article antimicrobial activities of ZnO nanoparticles (Musarrat, n.d.); and a Research Article antimicrobial activities of MgO nanoparticles (Zhang, n.d.).

In Section (iv) on Synthesis of Antibiotics there is a Research Article on synthesis of nano materials and composites as bactericides (Kalankesh, n.d.); and a Research Article on pyrimidine synthesis for antibacterials (Misra et al., 2019).

In Section (v) on Nanoparticles for Immunoassays there is a Research Article on a silver enhanced lateral flow assay to detect Staphylococcal Enterotoxin B (Gholamzad, n.d.); and a Short Communication on a silver enhanced nano-gold dot blot for leptospirosis (Raja et al., 2019).

In Section (vi) on Microbial Detection Methods there is a Research Article using platinum electrodes to detect food-spoiling bacteria (Fysun et al., 2019); and a Research Article on droplet digital PCR to detect *Bifidobacterium* in poultry feed (Raurich et al., 2019).

In Section (vii) on Liposomes there is a Research Article on the anti-MRSA activity of chitosan-coated liposomal dicloxacillin (Alshamsan et al., 2019); and a Research Article on drug delivery in ethanolic liposome particles (Paliwal et al., 2019).

In Section (viii) on Immobilizing Matrices there is a Research Article

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on deposition of *E. coli* into silicon pores (Güler et al., 2019) and a Research Article on hydrogel synthesis, characterization and biomedical applications (Patil et al., 2019).

It is hoped that this volume will provide Microbiologists, Molecular Biologists, Biochemists and scientists in related fields with a comprehensive and up to date account of methods that are shaping the field of Nanotechnology.

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Sarvesh Soni
Andrew S Ball
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Contents

(i) Nanoparticles

- Ali, J., Ali, N., Wang, L., Waseem, H., Pan, G., 2019. Revisiting the mechanistic pathways for bacterial mediated synthesis of noble metal nanoparticles. *J. Microbiol. Meth.* 159, 18–25. <https://doi.org/10.1016/j.mimet.2019.02.010>.
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- Husain, S., Afreen, S., Hemlata, Yasin D., Afzal, B., Fatma, T., 2019. Cyanobacteria as a bioreactor for synthesis of silver nanoparticles-an effect of different reaction conditions on the size of nanoparticles and their dye decolorization ability. *J. Microbiol. Meth.* 162, 77–82. <https://doi.org/10.1016/j.mimet.2019.05.011>.
- Khanna, P., Kaur, A., Goyal, D., 2019. Algae-based metallic nanoparticles: synthesis, characterization and applications. *J. Microbiol. Meth.* 163, 105656. <https://doi.org/10.1016/j.mimet.2019.105656>.
- Sharma, P., Pant, S., Dave, V., Tak, K., Sadhu, V., Reddy, K.R., 2019. Green synthesis and characterization of copper nanoparticles by *Tinospora cardifolia* to produce nature-friendly copper nano-coated fabric and their antimicrobial evaluation. *J. Microbiol. Meth.* 160, 107–116. <https://doi.org/10.1016/j.mimet.2019.03.007>.

(ii) Antibiotics

- Ashwini, A., Ramya, H.N., Ramkumar, C., Reddy, K.R., Kulkarni, R.V., Abinaya, V., et al., 2019. Reactive mechanism and the applications of bioactive prebiotics for human health: review. *J. Microbiol. Meth.* 159, 128–137. <https://doi.org/10.1016/j.mimet.2019.02.019>.
- Baker, S., Prudnikova, S.V., Shumilova, A.A., Perianova, O.V., Zharkov, S.M., Kuzmin, A., 2019. Bio-functionalization of phytogetic Ag and ZnO nanobactericides onto cellulose films for bactericidal activity against multiple drug resistant pathogens. *J. Microbiol. Meth.* 159, 42–50. <https://doi.org/10.1016/j.mimet.2019.02.009>.
- Nagaraja, A., Jalageri, M.D., Puttaiahgowda, Y.M., Raghava Reddy, K., Raghu, A.V., 2019. A review on various maleic anhydride antimicrobial polymers. *J. Microbiol. Meth.* 163, 105650. <https://doi.org/10.1016/j.mimet.2019.105650>.

(iii) Antibiotic nanoparticles

- Alhowyan, A.A., Altamimi, M.A., Kalam, M.A., Khan, A.A., Badran, M., Binkathlan, Z.,

- et al., 2019. Antifungal efficacy of Itraconazole loaded PLGA-nanoparticles stabilized by vitamin-E TPGS: in vitro and ex vivo studies. *J. Microbiol. Meth.* 161, 87–95. <https://doi.org/10.1016/j.mimet.2019.01.020>.
- Das DP. New Avenues of Controlling Microbial Infections through Anti-microbial and Anti-Biofilm Potentials of Green Mono- & Multi-metallic Nanoparticles: A Review. *MIMET_2019_386*.
- Farghali M. Antiprotozoal activity of silver nanoparticles against *Cryptosporidium parvum* oocysts: new insights on their feasibility as a water disinfectant. *J. Microbiol. Meth.* *MIMET_2019_366*.
- Musarrat J. Myristica fragrans bio-active esters functionalized ZnO nanoparticles exhibit antibacterial and antibiofilm activities in clinical isolates. *J. Microbiol. Meth.* *MIMET_2019_457*.
- Zhang X. Template-Free Synthesis of High-Purity Mesoporous MgO Nanoparticles as Antimicrobial Through a Porous Magnesium Carbonate Nanobelt Intermediate. *MIMET_2018_760*.

(iv) Synthesis of antibiotics

- Kalankesh I. Synthesis and characterization of nano materials and composites as bactericides. *MIMET_2019_132*.
- Misra, A., Jain, S., Kishore, D., Dave, V., Reddy, K.R., Sadhu, V., et al., 2019. A facile one pot synthesis of novel pyrimidine derivatives of 1,5-benzodiazepines via domino reaction and their antibacterial evaluation. *J. Microbiol. Meth.* 163, 105648. <https://doi.org/10.1016/j.mimet.2019.105648>.

(v) Nanoparticles for immunoassays

- Gholamzad M. High sensitive Detection of Staphylococcal Enterotoxin B (SEB) by Silver Enhanced Lateral Flow Assay. *MIMET_2019_553*.
- Raja, V., Prasad, M., Bothammal, P., Saranya, P., Sumaiya, K., Akino Mercy, C.S., et al., 2019. Silver enhanced nano-gold dot blot immunoassay for leptospirosis. *J. Microbiol. Meth.* 156, 20–22. <https://doi.org/10.1016/j.mimet.2018.11.021>.

(vi) Microbial detection methods

- Fysun, O., Schmitt, A., Auernhammer, P.T., Rauschnabel, J., Langowski, H.-C., 2019. Electrochemical detection of food-spoiling bacteria using interdigitated platinum microelectrodes. *J. Microbiol. Meth.* 161, 63–70. <https://doi.org/10.1016/j.mimet.2019.04.015>.
- Raurich, S., Weber, B., Klose, V., Mohnl, M., Petri, D., Fibi-Smetana, S., 2019. Optimisation of a droplet digital PCR for strain specific quantification of a probiotic *Bifidobacterium animalis* strain in poultry feed. *J. Microbiol. Meth.* 163, 105646. <https://doi.org/10.1016/j.mimet.2019.105646>.

(vii) Liposomes

- Alshamsan, A., Aleanizy, F.S., Badran, M., Alqahtani, F.Y., Alfassam, H., Almalik, A., et al., 2019. Exploring anti-MRSA activity of chitosan-coated liposomal dicloxacillin. *J. Microbiol. Meth.* 156, 23–28. <https://doi.org/10.1016/j.mimet.2018.11.015>.
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(viii) Immobilizing matrices

- Güler, S., Oruç, Ç., Altundal, A., 2019. Electric field assisted deposition of *E. coli* bacteria into the pores of porous silicon. *J. Microbiol. Meth.* 161, 96–101. <https://doi.org/10.1016/j.mimet.2019.04.018>.
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