

Vijay B. Kumar, M. Tech., Ph.D.

George S. Wise Postdoctoral Fellow, Tel Aviv University, Tel Aviv, Israel
Broshim Dormitory Campus, Tel Aviv University, Tel-Aviv, Israel

OBJECTIVE AND INTEREST

Skilled in Nanotechnology, Nanomaterial's synthesis, Biomaterials, Polymer, Self-assembly of amino acids, Self-assembly of PNA, Hydrogel, Characterization, Carbon/Graphene dots, Nanomaterials application in Catalysis, Energy, Biomedical, and Nano-Bio-Chem Interfaces. I plan to initiate interdisciplinary collaborations.

EXPERIENCES

- George S. Wise Postdoctoral Fellow**, Tel Aviv University, Tel Aviv, Israel **2020 – Present**
Formation of Nano-Bio conjugate for Biomedical applications
 - ▶ Making the protein-gold nano dimer, trimer nanostructure and related characterizations
 - ▶ Working on DNA nanotechnology (making the conductive DNA, Oligo nucleotide with gold nanoparticles)
 - ▶ Atomic force microscopy, Transmission Electron microscopy, Gel-electrophoresis, Spectrophotometer
- Director's Postdoctoral Fellow**, Los Alamos National Laboratory, Los Alamos, USA **2018 – 2020**
Catalyst development for Fuel cells
 - ▶ Sonochemical synthesis of nanoscale low PGM and PGM free catalyst for fuel cell application
 - ▶ Performance and Durability test of PEM fuel cells by RRDE and fuel cell station related characterizations
- Postdoc Research Associate**, Bar-Ilan University, Ramat Gan, Israel **2017 – 2018**
Nanotechnology, Material Chemistry, Biomaterials, Carbon dots, Nano-Metal, Polymer, Nano-Bio
 - ▶ Entrapment of organic molecules in nanomaterials, chiral imprinting, drug delivery, etc.
 - ▶ Biocompatible Metal/nonmetal doped carbon dots for live cell imagining, Biomedical, antimicrobial, biofuels, refractive index, and biophysical property modification
 - ▶ Synthesis of nanometal, metal oxide, polymer, and polymer carbon dots composite by sonochemistry
 - ▶ Technical writing ability with clear written and oral presentation of experimental data
- Master of technology project**, University of Hyderabad, Hyderabad, India **2011 – 2012**
 - ▶ Developed novel types of biocompatible self-assembled ZnO, hmPCL-siRNA, SiO₂-plex nano-capsule for drug delivery, drug targeting, loading of doxorubicin (an anticancer drug), cancer therapy
 - ▶ Size dependency characteristics for drug delivery applications and biocompatibility
- Summer Internship project**, National University of Singapore, Singapore **10 weeks (2011)**
 - ▶ Synthesis of metal doped tungsten oxide perovskite nanomaterials for spintronic applications.
- Master of science project**, Tezpur University, Tezpur, India **2009 – 2010**
 - ▶ Synthesis of tungsten oxide nanomaterials for biomedical applications
 - ▶ Investigated the interaction of tungsten oxide nanoparticles with human genomic DNA, BSA protein and antibacterial activity of tungsten oxide nanoparticles.

EDUCATIONS

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| 10/2012 -
12/2016 | Ph.D. in Chemistry/Nanotechnology , Department of Chemistry, Bar-Ilan University, Israel (First class)
Thesis Title: Metal Micro/Nano Spheres Fabricated from the Molten Metal for Multi Applications |
| 07/2010 -
09/2012 | Master of Technology in Nanoscience and technology , School of Eng., University of Hyderabad, India. (First class with distinction)
Thesis Title: Synthesis of Core Shell Nanostructure for Physical & Biomedical Applications |
| 08/2008 –
06/2010 | Master of Science in Nanoscience and technology: Department of Physics, Tezpur University, India (First class with 3rd rank)
Thesis Title: Synthesis of Nanoscale WO ₃ materials for Physical & Biophysical Applications. |
| 07/2004 –
12/2007 | Bachelor of Sciences in Zoology Hons.
D. C. College, B. R. A. Bihar University, Muzaffarpur, India (First class) |
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Selected Research Papers

19. **Kumar V. B.**, Kumar, R., Gedanken A., “The Sonochemical Synthesis of Carbon Dots: Synthetic Route, Effect of Parameters, and Catalytic, Energy, Biomedical and Tissue Engineering Applications” *Ultrasonics Sonochemistry*, 2020, 64, 105009.
18. Kumar, R., Aadil K. R., Ranjan S, **Kumar V. B.**, “Advances of Nanotechnology and Nanomaterials based strategies for neural tissue engineering” *Journal of Drug Delivery Science and Technology*, 2020, 57, 101617
17. **Kumar V. B.**, Kumar R., Shafi, O. Gedanken A., “Fluorescent metal-doped carbon dots for neuronal manipulations” *Ultrasonics Sonochemistry*, 2019, 52, 205-213
16. **Kumar V. B.**, Khajuria D. K., Karasik D., Gedanken A., “Silver and Gold doped Hydroxyapatite Nanocomposites for Enhanced Bone Regeneration” *Biomedical materials*, 2019, 14, 055002.
15. Khajuria D. K. *, **Kumar V. B.** *, Karasik D., Gedanken A., “Accelerated bone regeneration by nitrogen-doped carbon dots functionalized with hydroxyapatite nanoparticles” *ACS Applied Materials & Interfaces*, 2018, 10(23), 19373–19385.
14. **Kumar V. B.**, A. Dolitzky, S. Michaeli, A. Gedanken, “Antiparasitic ointment based on biocompatible carbon dot nanocomposite”, *ACS Applied Nano Materials*, 2018, 1(4), 1784–1791
13. **Kumar V. B.**, M. Marcus, Z. Porat, L. Shanie, Y. Yeshurun, I. Felner, Orit Shefi, A. Gedanken, “Ultrafine highly magnetic fluorescent γ -Fe₂O₃/NCD nanocomposites for neuronal manipulations” *ACS Omega*, 2018, 3, 1897–1903.
12. Mishra R. K., **Kumar V. B.**, Monteran L., Sredni B., Gedanken A., “AS101-Loaded PLGA–PEG Nanoparticles for Autoimmune Regulation and Chemosensitization” *ACS Appl. Bio Mater.*, 2019, 2, 5, 2246-2251.
11. **Kumar V. B.**, Sahu A. K., Mohsin A. S. M., Li X., Gedanken A., “Refractive-index tuning of highly fluorescent carbon dots” *ACS Applied Materials & Interfaces*, 2017, 9(34), 28930-28938.
10. Khajuria D. K. *, **Kumar V. B.** *, Karasik D., Gedanken A., “Fluorescent nanoparticles with tissue dependent affinity for live zebrafish imaging” *ACS Applied Materials & Interfaces*, 2017, 9 (22), 18557–18565.
9. **Kumar V. B.**, Natan M., Jacobi G., Porat Z., Banin E., Gedanken A., “Ga@C-dots as an antibacterial agent for the eradication of *Pseudomonas aeruginosa*” *International Journal of Nanomedicine*, 2017, 12 725–730.
8. Nissan I., **Kumar V. B.** *, Porat Z., Makovec D., Shefi, O. Gedanken A. “The sonochemically-fabricated Ga@C-dots@Ga nanoparticle-Aided neural growth” *Journal of Materials Chemistry B*, 2017, 5, 1371-1379. **HOT paper**
7. Mishra, R. K., Shalom Y., **Kumar V. B.**, Luong J., Banin E., Gedanken A., “Surfactant-free synthesis of a water-soluble PEGylated nanographene-oxide/metal-oxide nanocomposite as engineered antimicrobial weaponry” *Journal of Materials Chemistry B*, 2016, 4, 6706-6715
6. **Kumar V. B.**, Sheinberger Y., Porat Z., Shav-Tal Y., Gedanken A. “A hydrothermal reaction of an aqueous solution of BSA yields highly fluorescent N doped C-dots used for imaging of live mammalian cells” *Journal of Materials Chemistry B*, 2016, 4, 2913-2920.
5. **Kumar V. B.**, Medhi H., Yong Z., Paik P., “Designing idiosyncratic hmPCL-siRNA nanoformulated capsules for silencing and cancer therapy” *Nanomedicine: Nanotechnology, Biology, and Medicine*, 2016, 12, 579–588.
4. **Kumar V. B.**, Mastai Y., Porat Z., Gedanken A., “Chiral imprinting in molten gallium” *New Journal of Chemistry*, 2015, 39, 2690-2696.

3. Kumar V. B., Kumar K., Gedanken A., Paik P., “Facile synthesis of self-assembled spherical and mesoporous dandelion capsules of ZnO: efficient carrier for DNA and anti-cancer drugs ” *Journal of Material Chemistry B*, **2014**, **2**, 3956-3964.

2. Kumar V. B., Y. Koltypin, A. Gedanken, Z. Porat, “Ultrasonic cavitation of molten gallium in water: Entrapment of organic molecules in gallium micro/nano-spheres ” *Journal of Material Chemistry A*, **2014**, **2**, 1309-1317.

1. Kumar V. B., G. Kimmel, Z. Porat, A. Gedanken, “Formation of Ga spheres in water by ultrasonic cavitation of molten gallium ” *Ultrasonics Sonochemistry*, **2014**, **21**(3), 1166-73.