

Santosh Aryal, Ph. D.

Associate Professor, Department of Pharmaceutical Sciences and Health Outcomes, Ben and Maytee Fisch College of Pharmacy, the University of Texas at Tyler.

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<mailto:jkhawly@retinatexas.com> <mailto:hlmatius@gmail.com> **Education**

2007 Ph. D. Bionanosystem Engineering (Drug Delivery, Materials Chemistry, and Bioengineering), Chonbuk National University, South Korea

1996 M. Sc. Organic Chemistry, Tribhuvan University, Nepal

1994 B. Sc. Chemistry and Biology, Tribhuvan University, Nepal

Research Support**Funded Extramural Grants (to date)**

1. **NIH-NIBIB-1R15EB030815-01:** Re-engineering tumor cell-derived extracellular vesicles with exogenous tags for downstream analysis.
Project period: 09/15/2020-08/31/2024.
Role: PI: **Aryal S.**; Budget: \$ 405,400.00
2. **NIH-NIAID-1R01AI179827-01:** Short course combination regimens for treatment of Mycobacterium avium pulmonary disease: a translational bench-to-bedside approach.
Project Period: 08/12/2023-31/10/2028
Role: Kant, Sashi (PI, UT Health Science Center, Tyler), **Aryal S.** (Co-I, University of Texas at Tyler)
Budget: \$ 2,664,761.00 Subaward to UT-Tyler: \$ 322,685.00
3. **NIH-NIBIB-1R01EB031022-01:** Development of a web-based predictive model of nanoparticle delivery to tumors by integrating physiologically-based pharmacokinetic modeling with artificial intelligence. Project Period: 01/09/2021-05/31/2025.
Role: Lin Z. (PI, University of Florida), **Aryal S.** (co-I, University of Texas at Tyler)
Budget: \$1,519,259.00; Subaward to UT-Tyler: \$ 342,068.00
4. **University of Texas System-Rising Star Award.** Development of anticancer drug delivery systems. Project Period: 2020-2023
Role: PI: **Aryal S** Budget: 300,00.00
5. **NSF-2020 NSF Award # 2029579:** Impact of Coronaviridae lipid, protein and RNA interaction on copper, zinc, and their derivatives coated personal protective equipment surfaces and viral infectivity. Project Period: 07/2020-12/2023.
Role: Gaudreault N (MPI); **Aryal S** (MPI); Budget: \$ 119,632.00
6. **NIH-NIBIB-5R03EB025566-02:** Physiologically based pharmacokinetic modeling and analysis of nanoparticle delivery to tumors. Project Period: 09/10/2017-08/31/2020.
Role: PI: Lin Z; Collaborator: **Aryal S.** Budget: \$ 245,341.00

Professional Experience

- 05/17/2021- **Associate Professor**, Department of Pharmaceutical Science and Health Outcomes, University of Texas at Tyler, TX
- 2014-05/16/2021 **Assistant Professor**, Department of Chemistry, Nanotechnology Innovation Center of Kansas State (NICKS), Kansas State University, Manhattan, KS
- 2012-2014 **Instructor**, Department of Translation Imaging, Houston Methodist Research Institute. *Advisor: Dr. Paolo Decuzzi*
- 2011-2012 **Adjunct Assistant Professor**, Department of Pharmaceutical Chemistry, University of Kansas, Lawrence.

- 2009-2012 **Assistant Project Scientist**, Department of Nanoengineering, University of California-San Diego.
Advisor: Prof. Liangfang Zhang
- 2008-2009 **Postdoctoral Research Associate**, University of Wisconsin-Milwaukee.
Advisor: Prof. Shaoqin (Sarah) Gong
- 2007-2008 **Postdoctoral Research Fellow**, Chonbuk National University, South Korea.
Advisor: Prof. Kim Hak Yong
- 2004-2007 **Researcher**, Ph.D. candidate, Department of Bionanosystem Engineering, Chonbuk National University, Chonju, South Korea.
Advisor: Prof. Kim Hak Yong
- 2000-2004 **Chemistry Lecturer**, National School of Science, Kathmandu, Nepal
General Chemistry (Physical, Inorganic, and Organic) to grade 12 level and Organic Chemistry to BS/MS level.
- 2002-2004 **Chemistry Lecturer**, Amrit Science College, Kathmandu, Nepal. General Chemistry (Physical, Inorganic, and Organic) to grade 12 level and Organic Chemistry to BS level, (Part-time)
- 2000-2004 **Chemistry Lecturer**, Bagmati Modern College (A Higher Secondary School), Kathmandu, Nepal, (Part-time)
- 2000-2004 **Chemistry Lecturer**, Rehdon College (A Higher Secondary School), Kathmandu, Nepal, (Part-time)
- 1997-2003 **Chemistry Lecturer**, Patan Multiple Campus, Tribhuvan University, Nepal, Organic Chemistry (BS/MS course), (Part-time)
- 1996-1997 **Quality Assurance Supervisor**, Asian Pharmaceuticals Pvt. Ltd., Nepal

Honors and Awards

- 2024** President's Scholar Achievement Award, UT-Tyler
- 2023** Recognition from Southern Biomedical Engineering Conference
- 2021** University of Texas System-Rising Star Award
- 2021** Vebleo Fellow Award
- 2015** Mentoring Award, Kansas State University
- 2015** Awarded first at International Society for Biomedical Polymers and Polymeric Biomaterials, July 8 Orlando, Florida, USA.
- 2011** Appreciation certificate award from the American Chemical Society (ACS) as a valuable reviewer, USA
- 2006** Young Scientist Award in an oral presentation organized by the Center for Healthcare Technology Development, Ministry of Education, Republic of Korea
- 2006** Young Scientist Award in Poster presentation organized by Center for Healthcare Technology Development, Ministry of Education, Republic of Korea

Teaching

- PHAR 7401 Biochemistry
- PHAR 7203 Medicinal Chemistry
- PHAR 7299 Independent Study-Research Experience in Nanotechnology
- PHAR 7402 Pharmaceuticals (Topic of choice)
- PHAR 7299 Pharmacology (Topic of choice)
- Previously Taught
- CHM-350 General Organic Chemistry (In person)
- CHM-350 General Organic Chemistry (Distance education)
- CHM-930 Graduate Organic Seminar
- CHM-970 Organic Chemistry
- AP-780 Cancer Nanomedicine

Funded Intramural Grants (to date)

1. **The University of Texas at Tyler (Internal Award):** Summer 2022. Natural Killer cell -mimicking nanocarrier for tumor-targeted drug delivery. Project period: 06/22-05/2023. PI: **Aryal S.** co-I: Raman (Krishna) Vankayalapati. Budget \$ 33,000.00
2. **University Small Research Grant (USRG): Fall 2019.** Evaluation of natural killer cell mimicking nanoparticle homing in humanized breast cancer model. Project period: 08/2019-07/2020. PI: **Aryal S.** Budget: \$ 4,500.00
3. **Johnson Cancer Research Center:** Innovative Research Award. **Fall 2018.** Natural killer cell mimic microbubble for selective isolation of circulating tumor cells. Project period: 11/2018-10/2019. PI: **Aryal S.** Budget: \$ 15,000.00
4. **Johnson Cancer Research Center:** Undergraduate Mentoring Award. **Fall 2018.** Budget: \$2,500.00
5. **Johnson Cancer Research Center:** Innovative Research Award. **Fall 2018.** Development of exosome-based cancer imaging agent. Project period: 11/2018-10/2019. PI: Weiss M. co-PIs; **Aryal S.**, Tamura M. Budget: \$ 15,000.00
6. **Johnson Cancer Research Center:** Innovative Research Award. **Spring 2017.** Natural killer cell membrane infused biomimetic liposome for tumor targeted drug delivery. Project period: 03/2018-02/2019. PI: **Aryal S.** Budget: \$ 21,000.00
7. **Johnson Cancer Research Center:** Instrument Award. Small animal imaging system. **Fall 2017.** PI: **Aryal S.**; Co-PI: DeLong R. K. Budget: \$ 30,000.00
8. **Johnson Cancer Research Center:** Innovative Research Award. **Spring 2016.** Engineering biomimetic theranostic nanoconstructs for the treatment and diagnosis of breast carcinoma. Project period: 03/2016-02/2017. PI: **Aryal S.** Budget: \$ 30,000.00
9. **K-State open access publishing fund (KOAPF) award, Fall 2016.** PI: **Aryal S.** Budget: \$ 14,95.00
10. **Johnson Cancer Research Center:** Innovative Research Award. **Spring 2015.** Chemo-photothermal therapy for cancer based on gold nanoparticle confinement in functional therapeutic polymeric nanoconstruct. Project period: 03/2015-02/2016. PI: **Aryal S.** Budget: \$ 25,000.00
11. **KSU Mentoring Award: Spring 2015.** Combinatorial multifunctional polymeric nanomedicine for the treatment of breast cancer using doxorubicin and salinomycin combination. Project period: 05/2015-04/2016. PI: **Aryal S.** Budget: \$ 6,000.00

Student Awards and Achievements

1. 09/2023-Vega A. Synthesis and characterization of PLGA nanoparticles with varying weights to study the weight effect on cellular uptake. 39th Southern Biomedical Engineering Conference (SBEC), 9th September 2023, New Orleans, LA. The **presenting author (Vega A.) is a High School Student.**
2. 04/2023-Aly R. CMPI nanoparticle formulation to enhance its delivery to intracellular targets. 8th Annual Lyceum Student Research Showcase.
3. 04/2023-Israel JS. Devising bacterial derived extracellular vesicle for cancer therapy". 8th Annual Lyceum Student Research Showcase.
4. 08/2022-Sulthana S. Synthesis and characterization of polymeric nanoparticles: effect of nanoparticle density in cellular compatibility and uptake. 38th SBEC (Southern Biomedical Research Conference) New Orleans, LA, USA.
5. 08/2022-Neelam A and Karki Salima. Design and characterization of electrospun nanofiber membrane for antibacterial drug delivery. 38th SBEC New Orleans, LA, USA.
6. 12/2019-Rebecca Sutcliffe received an undergraduate research presentation award at Undergraduate Research Symposium, Kansas State University (KSU).
7. 11/2019-Cesar Aparicio received an undergraduate research award from the

Department of Chemistry KSU.

8. 07/2019-Ramesh Marasini received ComSciCom-AIP fellowship jointly organized by national flagship Communicating Science Conference and American Institute of Physics in College Park, MD. This award is given to the selected students from North America to participate in the workshop.
9. 07/2019-Sagar Rayamajhi is among one of the candidates selected to participate in Midwest Retreat for Diversity in Chemistry at Luther College in Decorah, Iowa.
10. 04/2019-Tuyen Nguyen received Ohno Award, Chemistry, KSU.
11. 04/2019-Ramesh Marasini received the Graduate Student Summer Research Award - Johnson Cancer Research Center, KSU.
12. 04/2019-Ramesh Marasini received the Johnson Cancer Research Center Travel Award.
13. 03/2019-Sagar Rayamajhi received First Place presentation award at K-State Graduate Research, Arts, and Discovery (GRAD) Forum, KSU.
14. 09/2018-Cesar Aparicio received Cancer Research Undergraduate Award from Johnson Cancer Research Center.
15. 09/2018-Tuyen received first place oral presentation award-5th Annual Biopharmaceutical Research and Development Symposium "Nanotechnology for Immunotherapy" – UNMC, Omaha, Nebraska.
16. 07/2018-Tuyen received Scott Fateley Memorial Award-KSU, Manhattan, KS.
17. 07/2018-Sagar received Arts & Science Student Research Travel Award and GSC Travel Award to present a poster of his research at 256th ACS National Meeting, Boston.
18. 04/2018-Encouraged postdoc Dr. Arunkumar Pitchaimani in his career advancement. Work together with him to secure the **Marie Curie Fellowship**. Now he is working in the Italian Institute of Technology as a Mary Curie fellow.
19. 04/2018-Tuyen received Berschied and Derstadt Graduate Fellowship in Chemistry, KSU.
20. 03/2018-Ramesh received ACS Travel Award from the Division of Biological Chemistry to present research in ACS spring national meeting. This award is given to the selected abstracts among the applicants from a graduate or post-doc once in a lifetime to attend ACS meeting.
21. 03/2018-Tuyen received Graduate Student Summer Award - Johnson Cancer Research Center, KSU.
22. 03/2018-Tuyen Nguyen received Arts & Science student research Travel Award.
23. 03/2018-Ramesh Marasini received Arts & Science Student Research Travel Award.
24. 03/2018-Tuyen Nguyen and Ramesh Marasini received the Johnson Cancer Research Center Graduate Student Travel Award to give a talk at spring ACS national meeting, New Orleans.
25. 03/2017-Tuyen Nguyen received Science Communication Fellowship award from Sunset Zoo, Manhattan, KS.
26. 03/2017-REU student Ms. Courtney Crane awarded 3rd place poster award in KSU–REU research forum.
27. 02/2017-Tuyen Nguyen secured 1st place and people's choice award in Three Minute Thesis Competition-KSU. She represented K-State in the Midwestern 3M® Thesis competition.
28. 02/2017-Postdoc Dr. Arunkumar Pitchaimani received ACS Travel Award to present research at ACS national meeting, Washington DC.
29. 10/2016-Colin Ferrel received best poster presentation award in ACS Midwest Regional Meeting (MWRM) at Manhattan, KS.

30. 10/2016-Colin Ferrel received 2nd place oral presentation award in ACS MWRM, Manhattan, KS.
31. 08/2016-Soma Sekhar Sriadibhatla received Third place award in poster presentation in International Society of Biomedical Polymers and Polymeric Biomaterials (ISBPPB) meeting.
32. 08/2016-Tuyen Nguyen received First place award in poster presentation in International Society of Biomedical Polymers and Polymeric Biomaterials (ISBPPB) meeting.

Peer-Reviewed Journal Articles (* Corresponding author) (1-14 after joining UT Tyler)

*(Underlined first authors are members of the group; * Corresponding author)*

1. Sulthana S, Bhatti A, Mathew E, Quazi SH, Gaudreault NN, DeLong R, **Aryal S**. Synthetic graphene-copper nanocomposites interact with the hACE-2 enzyme and inhibit its biochemical activity. **Nanoscale Advances**, (2024) 6, 188-196. (IF: 4.7)
2. Singh S, Boorgula GD, **Aryal S**, Philley JV, Gumbo T, Srivastava S. Sarecycline pharmacokinetics/pharmacodynamics in the hollow-fibre model of Mycobacterium avium complex: so near and yet so far. **Journal of Antimicrobial Chemotherapy**, (2024) 79, 96-99. (IF: 5.2)
3. Kattel P, Sulthana S, Trousil J, Shrestha D, Pearson D, Aryal S*. Effect of nanoparticle weight on cellular uptake and drug delivery potential of PLGA nanoparticles. **ACS Omega**, (2023) 8, 30, 27146-27155. (IF: 4.1)
4. Singh S, Gumbo T, Alffenaar JW, Boorgula GD, Thomas TA, Dheda K, Malinga L, Raj P, Aryal S, Srivastava S. Meropenem-vaborbactam restoration of first-line drugs' efficacy and comparison of meropenem-vaborbactam-moxifloxacin versus BPaL MDR-TB regimen. **International Journal of Antimicrobial Agents** (2023) 106968. (IF: 10.8)
5. Rayamajhi S, Shulthana S, Ferrel C, Shrestha TB, **Aryal S***. Extracellular vesicles production and proteomic cargo varies with incubation time and temperature. **Experimental Cell Research**, (2023) 422, 113454. (IF: 3.7)
6. Lin Z, **Aryal S***, Cheng YH, Gesquiere AS. Integration of in vitro and in vivo models to predict cellular and tissue dosimetry of nanomaterials using physiologically based pharmacokinetic modeling. **ACS Nano** (2022) 16, 19722-19754. (IF: 17.1)
7. Nguyen T, Marasini R, **Aryal S***. Re-engineered imaging agent using biomimetic approaches. **Wiley Interdisciplinary Reviews: Nanomedicine and Nanotechnology** (2022) e1762. (IF: 6.3)
8. Marasini R, **Aryal S***. Indocyanine-type infrared-820 encapsulated polymeric nanoparticle-assisted photothermal therapy of cancer. **ACS Omega** (2022) 7, 12056-12065. (IF: 3.9)
9. Tabassum S, **Aryal S**. Real-time quantification of CD63 with anti-CD63 functionalized plasmonic fiber optic probe. **Proc. of SPIE** Vol 11953, 1195304-1
10. Marasini R, Rayamajhi S, Moreno-Sanchez A, **Aryal S***. Iron (iii) chelated paramagnetic polymeric nanoparticle formulation as a next-generation T 1-weighted MRI contrast agent. **RSC Advances** (2021) 11, 32216-32226. (IF: 3.9)
11. Ferrel C, Rayamajhi S, Nguyen T, Marasini R, Saravanan T, Deba F, **Aryal S***. Re-engineering a liposome with membranes of red blood cells for drug delivery and diagnostic application. **ACS Applied Bio Materials** (2021) 4, 6974-6981. (IF: 4.7)
12. Millagaha Gedara NI, Xu X, DeLong R, **Aryal S**, Jaber-Douraki M. Global Trends in cancer nanotechnology: A qualitative scientific mapping using content-based and bibliometric features for machine learning text classification. **Cancers** (2021) 13, 4417. (IF: 5.2)
13. DeLong RK, Swanson R, Niederwerder MC, Khanal P, **Aryal S**, Marasini R, Jaber-Douraki M, Shakeri H, Mazloom R, Schneider S, Ensley S, Clarke LL, Woode RA, Young S,

- Rayamajhi S, Miesner T, Higginbotham ML, Lin ZF, Shrestha T, Ghosh K, Glaspell G, Mathew EN. Zn-based physiometacomposite nanoparticles: distribution, tolerance, imaging, and antiviral and anticancer activity. *Nanomedicine* (2021) 16, 1857-1872. (IF: 5.5)
14. Rayamajhi S, Wilson S, **Aryal S***, DeLong R. Biocompatible FePO₄ nanoparticles: drug delivery, RNA stabilization, and functional activity. *Nanoscale Research Letters* (2021) 16, 1-9. (IF: 6.5)
 15. Trousil J, **Aryal S**, Fuhrmann G. Biogenic and biomimetic nanocarrier-based interventions: focus on intracellular infections. *Nanomedicine* (2021) 16-685-688.
 16. Basel MT, Shrestha TB, Pyle M, Nguyen T, **Aryal S**, Troyer DL, Bossmann SH. Designing a cleavable cell surface protein for cytotherapy and drug delivery applications. *Applied Sciences* (2021) 11, 2792.
 17. Nguyen TDT, Marasini R, Rayamajhi S, Cesar A, Biller D, **Aryal S***. Erythrocyte membrane concealed paramagnetic polymeric nanoparticle for contrast-enhanced magnetic resonance imaging. *Nanoscale* (2020), 12, 4137-4149.
 18. Rayamajhi S, Marasini R, Nguyen TDT, Plattner BL, Biller D, **Aryal S***. Strategic reconstruction of macrophage-derived extracellular vesicles as magnetic resonance imaging contrast agent. *Biomaterials Science* (2020) 8, 2887-2904.
 19. Pannzzo M, Esposito S, Wu LP, Key J, **Aryal S**, Celia C, Marzio L, Moghimi SM, Decuzzi P. Overcoming nanoparticle-mediated complement activation by surface PEG-pairing. *Nano Letter* (2020), DOI: <https://doi.org/10.1021/acs.nanolett.0c01011>
 20. Marasini R, Nguyen TDT, Rayamajhi S, **Aryal S***. Synthesis and characterization of a tumor-seeking LyP-1 peptide integrated lipid-polymer composite nanoparticle. *Mater. Adv.* (2020), DOI: <https://doi.org/10.1039/D0MA00203H>
 21. Rayamajhi S, **Aryal S***. Surface functionalization strategies of extracellular vesicles. *Journal of Materials Chemistry B* (2020), DOI: <https://doi.org/10.1039/D0TB00744G>
 22. Marasini R, Nguyen TDT, **Aryal S***. Integration of gadolinium in nanostructure for contrast enhanced-magnetic resonance imaging. *WIREs Nanomedicine & Nanobiotechnology* (2020), DOI: 0.1002/wnan.1580
 23. Rayamajhi S, Marchitto J, Nguyen TDT, Marasini R, Celia C, **Aryal S***. pH-responsive cationic liposome for endosomal escape mediated drug delivery. *Colloids and Surfaces B: Biointerfaces* (2020), 188, 1108040.
 24. DeLong RK, Dean JM, Glaspell GP, Jaberi-Douraki M, Ghosh KC, Davis D, Monteiro-Riviere NA, Chandran P, Nguyen TDT, **Aryal S**, Middaugh CR, Park SC, Choi SO, Ramani M. Amino/amido conjugates form to nanoscale cobalt physiometacomposite (PMC) materials functionally delivering nucleic acid therapeutic to the nucleus enhancing anticancer Activity via Ras-Targeted Protein Interference. *ACS Applied Bio Materials* (2020), 1, 175-179.
 25. Rayamajhi S, Nguyen TDT, Marasini R, **Aryal S***. Macrophage-derived exosome mimetic hybrid vesicle for tumor-targeted drug delivery. *Acta Biomaterialia* (2019), 94, 482-494.
 26. Nguyen TDT, Aryal S, Pitchaimani A, Park S, Key J, **Aryal S***. Biomimetic surface modification of discoidal polymeric particles. *Nanomedicine: Nanotechnology, biology, and Medicine* (2019), 16, 79-87.
 27. Abello J, Nguyen TDT, Marasini R, **Aryal S***, Weiss ML*. Biodistribution of gadolinium and near-infrared labeled human umbilical cord mesenchymal stromal cell-derived exosomes in tumor bearing mice. *Theranostics* (2019), 9, 2325-2345.
 28. Pitchaimani A, Nguyen TDT, Marasini R, Eliyapura A, Azizi T, Jabari-Douraki M, **Aryal S***. Biomimetic natural killer membrane camouflaged polymeric nanoparticle for targeted bioimaging. *Advanced Functional Materials* (2019), 1806817.

29. Marasini R, Pitchaimani A, Nguyen TDT, **Aryal S***. The influence of polyethylene glycol passivation on the surface plasmon resonance induced photothermal properties of gold nanorods. **Nanoscale** (2018), 10 (28), 13684-13693.
30. Pitchaimani A, Nguyen TDT, **Aryal S***. Nature killer cell membrane infused biomimetic liposomes for targeted tumor therapy. **Biomaterials** (2018), 160, 124-137.
31. Nguyen TDT, Pitchaimani A, Ferrel C, Thakkar R, **Aryal S***. Nano-confinement driven enhanced magnetic relaxivity of SPIONs for targeted tumor bioimaging. **Nanoscale** (2018), 10, 284-294.
32. Schutt C, Ibsen S, Zahavy E, **Aryal S**, Kuo S, Esener S, Berns M, Esener S. Drug delivery nanoparticles with locally tunable toxicity made entirely from a light-activatable prodrug of doxorubicin. **Pharmaceutical research** (2017), 1-11.
33. Eshete M, Bailey K, Nguyen TDT, **Aryal S**, Choi, SO. Interaction of immune system protein with PEGylated and un-PEGylated polymeric nanoparticles. **Advances in Nanoparticles** (2017), 6 (03), 103.
34. **Aryal S***, Nguyen TDT, Pitchaimani A, Shrestha TB, Biller D, Troyer D. Membrane fusion-mediated gold nanoplating of red blood cell: a bioengineered CT-contrast agent. **ACS Biomaterials Science & Engineering** (2017), 3, 36-41.
35. Pitchaimani A, Nguyen TDT, M Koirala, Y Zhang, **Aryal S***. Impact of cell adhesion and migration on nanoparticle uptake and cellular toxicity. **Toxicology in Vitro** (2017), 43, 29-39.
36. Ramani M, Nguyen TDT, **Aryal S**, Ghosh KC, DeLong RK. Elucidating the RNA nanobio interface: mechanisms of anti-cancer poly I: C RNA and zinc Oxide nanoparticle interaction. **The Journal of Physical Chemistry C** (2017), 129, 15702.
37. Pitchaimani A, Nguyen TDT, Maurmann L, Key J, Bossmann SH, **Aryal S***. Gd³⁺ tethered gold nanorods for combined magnetic resonance imaging and photo-thermal therapy. **Journal of Biomedical Nanotechnology** (2017), 13, 417-426.
38. Stigliano C, Ramirez MR, Singh JV, **Aryal S**, Key J, Blanco E, Decuzzi P. Methotrexate-loaded hybrid nanoconstructs target vascular lesions and Inhibit atherosclerosis progression in ApoE-/- Mice. **Advanced Healthcare Materials** (2017), 1601286.
39. DeLong RK, Mitchell JA, Morris RT, Comer J, Hurst MN, Ghosh K, Wanekaya A, Mudge M, Schaeffer A, Washington LL, Marhanka AR, Thomas S, Marroquin S, Lekey A, Smith JJ, Garrad R, **Aryal S**, Abdelhakim M, Glaspell GP. Enzyme and cancer cell selectivity of nanoparticles: inhibition of 3-D metastatic phenotype and experimental melanoma by zinc oxide. **Journal of Biomedical Nanotechnology** (2017), 13, 1-11.
40. Muhammad F, Nguyen TDT, Raza A, Akhtar B, **Aryal S***. A review on nanoparticle-based technologies for biodegradation. **Drug and Chemical Toxicology** (2017), 1-9.
41. Nguyen, TDT, Pitchaimani A, **Aryal S***. Engineered nanomedicine with alendronic acid corona improves targeting to osteosarcoma. **Scientific Reports** (2016), 6, 36707-36716.
42. DeLong RK, Hurst MN, **Aryal S**, Inchun N.K. Unique boron carbide nanoparticle nanobio interface: effects on protein-RNA interactions and 3-D spheroid metastatic phenotype. **Anticancer research** (2016), 36, 2097-2103.
43. Nguyen TDT, Pitchaimani A, Koirala MB, Muhammad F, **Aryal S***. Engineered biomimetic nanoabsorbent for cellular detoxification of chemotherapeutics. **RSC Advances** (2016), 6, 33003-33008.
44. **Aryal S***, Stigliano C, Key J, Ramirez M, Anderson J, Karmonik C, Fung S, Decuzzi P. Paramagnetic Gd³⁺ labeled red blood cells for magnetic resonance angiography. **Biomaterials** (2016), 98, 163-170.

45. Pitchaimani A, Nguyen TDT, Wang H, Bossmann SH, **Aryal S***. Design and characterization of gadolinium infused theranostic liposomes. **RSC Advances** (2016), 6, 36898-36905.
46. Iodice C, Cervadoro A, Palange AL, Key J, **Aryal S**, Ramirez MR, Mattu C, Ciardelli G, Neil BEO, Decuzzi P. Enhancing photothermal cancer therapy by clustering gold nanoparticles into spherical polymeric nanoconstructs **Optics and Lasers in Engineering**, (2016) 76, 74-81.
47. Koirala MB, Nguyen TDT, Pitchaimani A, Choi SO, **Aryal S***. Synthesis and characterization of biomimetic hydroxyapatite nanoconstruct using chemical gradient across lipid bilayer. **ACS Applied Materials Interfaces** (2015), 7, 27382–27390.
48. Stigliano S, Key J, Ramirez M, **Aryal S**, Decuzzi P. Radiolabeled polymeric nanoconstructs loaded with docetaxel and curcumin for cancer combinatorial therapy and nuclear imaging. **Advanced Functional Materials** (2015), 25, 3371-3379.
49. Key J, Palange AL, Gentile F, **Aryal S**, Stigliano C, Mascolo DD, De RE, Cho M, Lee Y, Singh J, Decuzzi P. Soft discoidal polymeric nanoconstructs resist macrophage uptake and enhance vascular targeting in tumors. **ACS Nano** (2015), 9, 11628-11641.
50. **Aryal S**, Key J, Stigliano C, Landis MD, Lee DY, Decuzzi P. Positron emitting magnetic nanoconstruct for PET/MR imaging. **Small** (2014) 10, 2688
51. Gizzatov A, Key J, **Aryal S**, Ananta J, Cervadoro A, Palange A, Fasano C, Stigliano C, Zhong M, Mascolo D, Guven A, Chiavazzo E, Asinari P, Liu X, Ferrari M, Wilson JL, Decuzzi P. Magnetic nanoparticles: Hierarchically-structured magnetic nanoconstructs with enhanced relaxivity and cooperative tumortropic accumulation. **Advanced Functional Materials** (2014), 24, 4584.
52. Cervadoro A, Cho M, Key J, Cooper C, Stigliano C, **Aryal S**, Brazdeikis A, Leary JF, Decuzzi P, Synthesis of multifunctional magnetic nano-flakes for magnetic resonance imaging, hyperthermia, and targeting. **ACS applied materials & interfaces** (2014) 6, 12939.
53. **Aryal S**, Key J, Stigliano C, Zhong M, Decuzzi P, Engineered magnetic hybrid nanoparticles with enhanced relaxivity for tumor imaging. **Biomaterials** (2013), 34, 7725.
54. **Aryal S**, Hu CM, Fang R, Dehaini D, Carpenter C, Zhang DE, Zhang L. Erythrocyte membrane-cloaked polymeric nanoparticles for controlled drug loading and release. **Nanomedicine** (2013), 8, 1271.
55. Key J, **Aryal S**, Gentile F, Jeyarama AS, Zhong M, Melissa DL, Decuzzi P. Engineering discoidal polymeric nanoconstructs with enhanced magneto-optical properties for tumor Imaging. **Biomaterials** (2013), 34, 5402.
56. Stigliano C, **Aryal S**, Tullio MD, Nicchia GP, Pascazio G, Svelto M, Decuzzi P. siRNA-chitosan complexes in poly(lactic-co-glycolic acid) nanoparticles for the silencing of aquaporin-1 in cancer cells. **Molecular Pharmaceutics** (2013), 10, 3186
57. Daniele DM, Lyon CJ, **Aryal S**, Ramirez MR, Wang J, Candeloro P, Guindani M, Hsueh WA, Decuzzi P. Rosiglitazone-loaded nanospheres for modulating macrophage-specific inflammation in obesity. **Journal of Controlled Release** (2013), 170, 460.
58. **Aryal S**, Hu CM, Zhang L. Synthesis of Ptsome: a platinum-based liposome-like nanostructure. **Chemical Communication** (2012), 48, 2630.
59. **Aryal S**, Hu CM, Zhang L. Nanoparticle drug delivery enhances the toxicity of hydrophobic-hydrophilic drug conjugates. **Journal of Materials Chemistry** (2012), 22, 949.
60. Fang R, Chen K, **Aryal S**, Hu CM, Zhang K, Zhang L. Large-Scale Synthesis of Lipid-polymer hybrid nanoparticles using a multi-inlet vortex reactor. **Langmuir** (2012), 28, 13824-13829.

61. **Aryal S**, Hu CM, Zhang L. Polymeric nanoparticles with precise ratiometric control over drug loading for combination therapy. **Molecular Pharmaceutics** (2011), 8, 1401.
62. Hu CM, Zhang L, **Aryal S**, Cheung C, Fang R, Zhang L. Erythrocyte membrane-camouflaged polymeric nanoparticles as a biomimetic delivery platform. **Proceedings of the National Academy of Science (PNAS)** (2011), 108, 10980.
63. Clawson C, Ton L, **Aryal S**, Fu V, Esener S, Zhang L. Synthesis and characterization of lipid-polymer hybrid nanoparticles with pH-triggered PEG shedding. **Langmuir** (2011), 27, 10556.
64. Pornpattananangkul D, Zhang L, Olson S, **Aryal S**, Obonyo, M., Vecchio, K., Huang, C-M, Zhang L. Bacterial toxin-triggered drug release from gold nanoparticle-stabilized liposomes for the treatment of bacterial infection. **Journal of the American Chemical Society** (2011), 133, 4132.
65. **Aryal S**, Hu CM, Zhang L. Combinatorial drug conjugation enabled nanoparticle dual drug delivery, **Small** (2010), 6, 1442.
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Patents

1. **Aryal S**, Pitchaimani A, Nguyen TDT. Nanocarrier systems for imaging and delivery of active agents. **PCT/US2019/063319; WO/2020/112822** (2020).
2. **Aryal S**, Zhang L, Hu CM. Ratiometric combinatorial drug delivery. **PCT/US2011/035903; WO/2011/143201A2** (2011).
3. **Aryal S**, Remant BKC, Kim HY. Carbon nanotube-chitosan composites and method of manufacturing the same. Korea Patent No. 10-0702873.
4. **Aryal S**, Remant BKC, Kim HY. Hybrid nanofiber and method of manufacturing for the same. Korean Patent No. **10-0739346**.
5. Remant BKC, **Aryal S**, Kim HY. Methods of manufacturing hydroxyapatite nanocomposite. Korean Patent No. **10-0795345**.

Book Chapters

1. **Aryal S**, Khil MS, Kim HY. Organic/Inorganic matrix mediated mineralization. Ed: Jie Hue. ***Recent Advances in Biomaterials Research*, 2008: SBN: 978-81-7895-332-8.**
2. Bajgai MP, **Aryal S**, Kim HY, Smart polymeric electrospun nanofiber for biological applications. ED: Songjun Li, Ashutosh Tiwari, Mani Prabakaran and Santosh Aryal. ***Smart Polymer Materials for Biomedical Applications*, 2009 ISBN: 978-1-60876-192-0.**
3. Tiwari A, Prabakaran M, **Aryal S**, Li S. Ed: Li S. Polysaccharide based colloidal carriers for drug delivery applications. ***Current Focus on Colloids and Surfaces* 2009 ISBN: 978-81-7895-438-7.**

4. Tiwari A, **Aryal S**, Prabharan M. Ed: Jayakumar R, Prabaharan M. Electrical conducting chitosan/polyaniline redox biomaterials for sensor applications ***Current Research and Developments on Chitin and Chitosan in Biomaterials Science, Vol. 2, ISBN: 978-81-308-0299-2.***

Book Edited

1. **Smart Polymer Materials for Biomedical Applications. 2009 ISBN: 978-1-60876-192-0.** ED: Li S., Tiwari A, Mani P, and **Aryal S**. Book covered eighteen chapters dealing with smart materials for various biomedical applications. Scientists from different renowned institutions contributed world-class research to the book.

Invited Talks: (1-9 after joining UT-Tyler)

1. Nanotechnology in Medicine: Where we are? **Aryal S**. Department of Pharmacy, Kathmandu University, Nepal. June 19, 2024
2. Nanomedicine: Today's Clinical Status. **Aryal S**. Health Science Center, North Campus, UT-Tyler. 11/14/2023.
3. Drug Delivery Nanotechnology; Today's status. **Aryal S**. Department of Bionanoengineering, College of Engineering, Jeonbuk National University, Jeonju. 06/02/2023 South Korea.
4. Extracellular vesicles in drug delivery technology. **Aryal S**. Department of Biomedical Engineering, Yonsei University, MIRAE campus. 06/13/2023 Wonju, South Korea.
5. Optimizing extracellular vesicles isolation and re-engineering as a drug delivery system. 38th annual southern biomedical engineering conference. 2022 August 25-28, New Orleans, LA, USA.
6. Improving Pharmacokinetics and Enhancing the Contrast of Gadolinium-based Contrast Agents. ACS Spring 2022. San Diego March 20-24.
7. Colloidal nanomedicines in cancer diagnosis and therapy. February 28 2022. Amirkabir University of Technology, Tehran, Iran.
8. Engineering cell-based magnetic resonance imaging contrast agents. 37th annual Southern biomedical engineering conference. 2021 December 3-5, New Orleans, LA, USA.
9. Engineering extracellular vesicles as a magnetic contrast agent. Nanomedicine, Nanomaterials, and Nanotechnology, Vebleo Webinar. 2021 June 25-28.
10. Re-engineering extracellular vesicles as refined nanotheranostics. **Aryal S**. Department of Regenerative Medicine and Orthopedics, Houston Methodist Research Institute, Houston, TX. 2019 August 13.
11. Rationally designed nanoparticles for targeted drug delivery. **Aryal S**. Department of Chemistry, Pittsburg State University, Pittsburg, Kansas. 2019 April 19.
12. Cell membrane camouflage therapeutic nanoparticles: A biomimetic design to fight against cancer. **Aryal S**. Department of Pharmaceutical Sciences, College of Pharmacy, University of Nebraska Medical College. 2018 October 5, Omaha, Nebraska.
13. Biologically inspired design consideration for polymeric anticancer nanomedicine. **Aryal S**. ACS national meeting, 2018 August 19-23, Boston, MA.
14. Rationale design of polymeric nanoparticle for diagnosis and therapy of cancer. **Aryal S**. Central Department of Chemistry, Tribhuvan University, 2018 June 7, Kathmandu, Nepal.

15. Synthesis and characterization of polymeric anticancer nanoparticles. **Aryal S.** Department of Chemical Science and Engineering, Kathmandu University, 2018 June 5, Dhulikhel, Nepal.
16. Integration of bio-membrane in synthetic nanoparticle for diagnosis and therapy. **Aryal S.** ACS national meeting, 2018 March 18-22, New Orleans, LA.
17. Rational design of polymeric nanoparticle as a theranostic device. **Aryal S.** Chonbuk National University, 2016 April 2, Jeonju, Republic of Korea.
18. Polymeric nanomedicine as a therapeutic and diagnostic modality. **Aryal S.** Yonsei University, 2016 April 4, Wonju, Republic of Korea.
19. Polymeric nanomedicine for targeting bone microenvironment. **Aryal S.** Polymer Society of Korea, 2016 April 8, Daejeon, Republic of Korea.
20. A look towards the theranostic biomaterials, **Aryal S.** Department of Chemistry, University of Missouri-Kansas City, 2016 September 29, Kansas.
21. Magnetic resonance glowing red blood cells. **Aryal S.** Biomedical Engineering Society, 2016 October 5-8, Minneapolis, Minnesota.
22. Development of clinically relevant biomimetic magnetic resonance imaging contrast agent. **Aryal S.**, ACS MWRM, 2016 October 28, Manhattan, Kansas.
23. Polymeric nanomedicine: Engineering and application in cancer treatment. **Aryal S.** Department of Physics, Kansas State University, 2015 February 6, Manhattan, KS.
24. Polymeric nanomedicine: A look at theranostics. Department of Anatomy and Physiology, 2015 February 16, Manhattan, KS.

Conference Proceedings, Presentations, and contributed presentations (* Corresponding author) 1-19 after joining UT-Tyler

1. Extracellular vesicle infused liposomes in targeted drug delivery. Shoukath Sulthana, Dinesh Shrestha, Israel Joshua Santhosh, Macie Kirby, Anavya Jernigan, **Santosh Aryal***. ACS March 17-18 Spring 2024, New Orleans. (Oral Presentation)
2. Engineering Immune cell with a model drug: A Cell-based Approach for Cancer Treatment. Macie Kirby, Dinesh Shrestha, Israel Joshua Santhosh, Shoukath Sulthana, **Santosh Aryal***. ACS March 17-18 Spring 2024, New Orleans. (Poster Presentation)
3. Tumor-derived extracellular vesicles hybridized liposomes in cancer therapy Shoukath Sulthana, **Santosh Aryal***, Biophysical Journal, San Diego CA, 2023.
4. Maximizing tumor targeting using engineered extracellular vesicles derived from activated macrophages. Israel Joshua Santhosh, Shoukath Sulthana, Ayan Khan, Farah Deba, **Santosh Aryal***. 8th Annual Lyceum Student Research Showcase. Friday, April 14th, 2023 (Poster Presentation) -**Awarded**
5. Effect of macrophage derived extracellular vesicles on the surface plasmon resonance induced photothermal properties of gold nanorods. Anavya Jernigan, Israel Joshua Santhosh, Shoukath Sulthana, **Santosh Aryal***. 8th Annual Lyceum Student Research Showcase. Friday, April 14th, 2023 (Poster Presentation)
6. Synthesis and Characterization of therapeutic nanoparticle: Impact of nanoparticle weight on cellular behaviors. Dinesh Shrestha, Prabhat Kattel, Shoukath Sulthana, Jiří Trousil, David Pearson, **Santosh Aryal***. 8th Annual Lyceum Student Research Showcase. Friday, April 14th, 2023 (Oral Presentation)
7. Engineering polycaprolactone-hydroxyapatite composite nanofiber antibacterial wound healing scaffolds. Salima Karki, Itzel Montoya, Shoukath Sulthana, **Santosh**

- Aryal**, May H. Abdel Aziz. 8th Annual Lyceum Student Research Showcase. Friday, April 14th, 2023 (Poster Presentation).
8. Study the interaction between human immune and cancer cells. Macie Kirkby, Shoukath Sulthana, Dinesh Shrestha, **Santosh Aryal***. 8th Annual Lyceum Student Research Showcase. Friday, April 14th, 2023 (Poster Presentation)
 9. 3D Printing of Clinical Relevant Cell Laden Hydrogel Tumor Tissue for Downstream Study. Angel Perez, Francisco Perez, Shoukath Sulthana, Shawana Tabassum, and **Santosh Aryal***. 8th Annual Lyceum Student Research Showcase. Friday, April 14th, 2023 (Poster Presentation)
 10. CMPI nanoparticle formulation to enhance its delivery to intracellular targets. Rahma Aly, Shoukath Sulthana, Robert Beaudoin, Ayman Hamouda, **Santosh Aryal***. 8th Annual Lyceum Student Research Showcase. Friday, April 14th, 2023 (Poster Presentation)-**Awarded**
 11. Synthesis and Characterization of PLGA Nanoparticles with Varying Weights to Study the Weight Effect on Cellular Uptake. Anthony Vega, Dinesh Shrestha, Isreal Joshua Santhosh, **Santosh Aryal***. 39th Southern Biomedical Engineering Conference, New Orleans, 09/7-09/10, 2023 (Poster Presentation)-**Awarded. K-12 Student.**
 12. Optimization of Localized Photothermal Cancer Therapy Utilizing Liposomal Indocyanine Green Photoactive Dye. Dinesh Shrestha, Danyel Manteufel, Shelby Metcalf, Anna Montero, Shoukath Sulthana, **Santosh Aryal***. 39th Southern Biomedical Engineering Conference, New Orleans, 09/7-09/10, 2023 (Poster Presentation).
 13. Biogenic modification of functional properties of mouse macrophage-derived extracellular vesicles by bacterial vesicles to enhance cancer targeting. Israel Joshua Santhosh, Ayan Khan, Shoukath Sulthana, Farah Deba, **Santosh Aryal***. 39th Southern Biomedical Engineering Conference, New Orleans, 09/7-09/10, 2023 (Oral Presentation).
 14. Role of Tumor-Derived Exosomes in Tumor Targeting. Shoukath Sulthana, Dinesh Shrestha, and **Santosh Aryal***. 39th Southern Biomedical Engineering Conference, New Orleans, 09/7-09/10, 2023 (Oral Presentation).
 15. Isolation and Investigation of Drug Delivery Potentials of Extracellular Vesicles Derived from Natural Killer Cell. Hadeeqah Quazi, Israel Joshua Santhosh, Shoukath Sulthana, **Santosh Aryal***. 39th Southern Biomedical Engineering Conference, New Orleans, 09/7-09/10, 2023 (Poster Presentation).
 16. Synthesis and characterization of polymeric nanoparticles: effect of nanoparticle density in cellular compatibility and uptake. Sulthana S, Kattel P, Trousil J, Pearson D, **Aryal S***. 38th annual southern biomedical engineering conference. 2022 August 25-28, New Orleans, LA, USA. (Oral Presentation) **Awarded**
 17. Synthesis and characterization of nicotinic acetylcholine receptors positive allosteric modulator loaded polymeric nanoparticle to maximize brain bioavailability.. Aly R, Beaudoin R, Sulthana S, Hamouda A, **Aryal S***. 38th annual southern biomedical engineering conference 2022 August 25-28, New Orleans, LA, USA.
 18. Design and characterization of electrospun nanofiber membrane for antibacterial drug delivery. Neelam A, Karki Salima, Cagle-White B, Solis Araceli, Ali L, Alsmairat O, **Aryal S**, Abdelaziz MH. 38th annual southern biomedical engineering conference. 2022 August 25-28, New Orleans, LA, USA. (Poster Presentation) **Awarded**

19. Immune cell mimicking nanoparticle with tumor targeting motifs. **Aryal S.** 37th annual southern biomedical engineering conference. 2021 December 3-5, New Orleans, LA, USA. (Poster Presentation)
20. Marasini R, Nguyen TDT, Rayamajhi S, **Aryal S***. *Interaction of tumor homing LyP-1 peptide designed as lipid-polymer hybrid nanoparticle with overexpressed cell surface protein p32 using osteosarcoma tumor model.* ACS National Meeting. March 31-April 4, 2019 Orlando, Florida.
21. Nguyen TDT, Pitchaimani A, Marasini R, **Aryal S***. *Cell membrane imprinted nanoparticle for enhanced tumor targeted drug delivery.* K-State Graduate Research, Arts, and Discovery (GRAD) Forum, March 27, 2019, Manhattan, Kansas.
22. Rayamajhi S, Nguyen TDT, Marasini R, **Aryal S***. *Anticancer drug loaded hybrid-exosome for tumor-targeted drug delivery.* Graduate Forum, KSU, 2019 Manhattan, KS.
23. Aparicio C, Nguyen TDT, **Aryal S***. *Synthesis and Characterization of Hypoxia-sensitive Platinum (IV) Prodrug.* ACS MWRM, October 21, 2018. Ames, Iowa.
24. Nguyen TDT, Pitchaimani A, **Aryal S***. *Cell membrane disguised nanoparticle with tumor targeting motifs.* 5th Annual Biopharmaceutical Research and Development Symposium "Nanotechnology for Immunotherapy", September 3, 2018, UNMC, Omaha, Nebraska.
25. Marasini R, Nguyen TDT, **Aryal S***. *Tumor-associated macrophage specific lipid-polymer hybrid nanoparticle.* 5th Annual Biopharmaceutical Research and Development Symposium "Nanotechnology for Immunotherapy", September 3, UNMC, Omaha, Nebraska.
26. Rayamajhi S, Nguyen TDT, Marasini R, Eliyapura A, **Aryal S***. *Engineering immune cell-derived hybrid exosome for tumor targeted drug delivery.* ACS National Meeting. August 19–23, 2018, Boston, MA.
27. **Aryal S***, Nguyen TDT, Pitchaimani A. *Integration of bio-membrane in synthetic nanoparticle for diagnosis and therapy.* ACS National Meeting. March 18, 2018, New Orleans, LA.
28. Marasini R, Pitchaimani A, Nguyen TDT, **Aryal S***. *Influence of poly-(ethylene glycol) coatings in the surface plasmon resonance induced photothermal property of gold nanorod.* ACS National Meeting. March 18, 2018, New Orleans, LA.
29. Nguyen TDT, Pitchaimani A, Ferrel C, **Aryal S***. *Effect of particle distance in magnetic properties of superparamagnetic iron oxide nanoparticle and its application in contrast enhance magnetic resonance imaging.* ACS National Meeting. March 18, 2018, New Orleans, LA.
30. Marasini R, Pitchaimani A, Nguyen TDT, **Aryal S***. *Effect of surface passivation on photothermal properties of gold nanorods.* ACS MWRM, October 20, 2017, Lawrence, KS.
31. Crane C, Nguyen TDT, Ferrel C, **Aryal S***. *Uniquely engineered doxorubicin-based pH responsive polymeric drug delivery device against breast cancer.* ACS MWRM, October 20, 2017, Lawrence, KS.
32. Ferrel C, Nguyen TDT, Pitchaimani P, **Aryal S***. *Engineering biomimetic liposome inspired by red blood cell.* Biomedical Engineering Society Annual Meeting, October 11-14, 2017, Phoenix, AZ.
33. A Pitchaimani, T Nguyen, **Aryal S***. *Paramagnetic gold nanorods for combined magnetic resonance imaging and photo-thermal therapy.* ACS National Meeting, August 20-24, 2017, Washington DC, USA.
34. Crane C, Nguyen TDT, Ferrel C, **Aryal S***. *Uniquely engineered doxorubicin-based pH responsive polymeric drug delivery device against breast cancer.* Awarded third at REU symposium, August 2, 2017 KSU, Manhattan, KS.

35. **Aryal S***, Nguyen TDT, Pitchaimani A, Ferrel C. *Bioinspired gadolinium-based polymeric nanoconstruct for enhanced magnetic resonance*. Gordon Research Conference on Cancer Nanotechnology, June 18-23, 2017, Mount Snow, VT.
36. Nguyen TDT, Pitchaimani A, Ferrel C, Maurmann L, **Aryal S***. *Bisphosphonate inspired bone microenvironment targeted theranostic polymeric nanoparticle*. Gordon Research Conference on Cancer Nanotechnology, June 18-23, 2017, Mount Snow, VT.
37. Ferrel C, Nguyen TDT, Pitchaimani A, **Aryal S***. *Engineering biomimetic liposome inspired by red blood cells*. K-State Graduate Research, Arts, and Discovery (GRAD) Forum, March 30, 2017, Manhattan, KS.
38. Nguyen TDT, Pitchaimani A, Shrestha TB, Biller D, Troyer D, **Aryal S***. *Re-engineered red blood cells as computed tomographic imaging agents*. K-State Graduate Research, Arts, and Discovery (GRAD) Forum, March 30, 2017, Manhattan, KS.
39. Bailey K, **Aryal S**, Choi SO, Eshete M. *Interaction of biodegradable nanoparticles with bovine serum albumin*. Mississippi Academy of Sciences, Feb 23-24, 2017.
40. Eshete M, Bailey K, **Aryal S**, Choi SO. *Interaction of modified and unmodified biodegradable nanoparticles with recombinant human mannose-binding protein: An innate immune system protein*. 2nd Global Nanotechnology Congress and Expo, December 1-3, 2016, Las Vegas, NV.
41. Pitchaimani A, Nguyen TDT, **Aryal S***. *Near infrared mediated photothermal therapy and T1- weighted magnetic resonance imaging using Gd³⁺ tethered gold nanorods*. ACS regional meeting, October 26-28, 2016, Manhattan, KS.
42. Nguyen TDT, Pitchaimani A, **Aryal S***. *Targeted hybrid therapeutic nanoparticle against bone cancer*. ACS regional meeting, October 26-28, 2016, Manhattan, KS.
43. Ferrel C, Nguyen TDT, Pitchaimani A, **Aryal S***. *Engineered biomimetic liposome inspired by the properties of red blood cell*. Awarded second at ACS regional meeting, October 26-28, 2016, Manhattan, Kansas
44. Nguyen TDT, Pitchaimani A, **Aryal S***. *Engineered nano-detoxifier for intracellular detoxification of doxorubicin*. Awarded first at International Society for Biomedical Polymer and Polymeric Biomaterials, August 11-12, 2016, Iselin, New Jersey.
45. Sekhar SS, Nguyen TDT, Pitchaimani A, **Aryal S***. *Synthesis and characterization of bisphosphonate functionalized poly(l-lactide) as a bone seeking agent*. Awarded third at International Society for Biomedical Polymer and Polymeric Biomaterials, August 11-12nd, 2016, Iselin, New Jersey.
46. Pitchaimani A, Nguyen TDT, Wang H, Bossmann HS, **Aryal S***. *Gadolinium infused theranostic liposomes for anticancer therapy*. American Association of Pharmaceutical Scientists, May 16-18, 2016, Boston, MA.
47. Nguyen TDT, Pitchaimani A, **Aryal S***. *Polymeric nanomedicine for targeting bone microenvironment*. Polymer Society of Korea, p45, April 7-8, 2016, Daejeon, South Korea.
48. Nguyen TDT, Pitchaimani A, Wang H, Bossmann HS, **Aryal S***. *Bone microenvironment targeted magnetic nanomedicine*. Awarded first at K-State Graduate Research, Arts, and Discovery (GRAD) Forum, March 30, 2016, Kansas State University, Manhattan, KS.
49. Sridibhatla SS, Nguyen TDT, Pitchaimani A, Koirala MB, **Aryal S***. *Bisphosphonate functionalized nanomedicine for targeting bone microenvironment*. Capitol Graduate Research Summit, February 2, 2016, State Capitol Building, Topeka, KS.
50. Nguyen TDT, Pitchaimani A, Koirala MB, **Aryal S***. *Engineering biomimetic nanoabsorbent for detoxification of chemotherapeutics*. Capitol Graduate Research Summit, February 2, 2016, State Capitol Building, Topeka, KS.

51. Koirala MB, Nguyen TDT, **Aryal S***. *Synthesis and characterization of biomimetic hydroxyapatite nanoconstruct using chemical gradient across lipid bilayer for subsequent modification of titanium implant. MRS Fall Meeting*, November 29-December 4, 2015, Boston, MA.
52. Nguyen TDT, Koirala MB, **Aryal S***. *Multifunctional theranostics nanomedicine for targeted treatment of metastatic breast cancer to bone. MRS Fall Meeting*, November 29-December 4, 2015, Boston, MA.
53. **Aryal S***, Koirala MB, Nguyen TDT, Sridibhatla SS. *Chemotherapy combined with photothermal therapy based on the confinement of gold nanoconstruct. Awarded first at International Society for Biomedical Polymers and Polymeric Biomaterials*, p8, July 8, 2015, Orlando, FL.
54. Sridibhatla SS, Nguyen TDT, Pitchaimani A, Koirala MB, **Aryal S***. *Bisphosphonate functionalized nanomedicine for targeting bone microenvironment. Awarded the best poster at Research and State Forum, at KSU-October 2015. Note: Selected to present in Capitol Graduate Research Summit on February 2016.*
55. Nguyen TDT, Pitchaimani A, Koirala MB, **Aryal S***. *Engineering biomimetic nanoabsorbent for detoxification of chemotherapeutics. Awarded the best poster at Research and State Forum, at KSU-October 2015. Note: Selected to present in Capitol Graduate Research Summit on February 2016.*
56. Delong RK, Glaspell G, Wanekaya A, Ghosh K, Smith J, Ekstam K, Bossmann SH, Sorensen C, Moneiro-Riviere NA, Comer J, **Aryal S**, Wolak J. *Synthesis of novel bio-element geocomposites and their biochemical characterization. Faraday Discussion*, April 20-22, 2015, Chicago, IL.
57. **Aryal S**, Daniele DM, Ramirez M, Wang J, Ren Y, Lyon CJ, Hsueh WA, Decuzzi P. *In vivo efficacy of rosiglitazone-loaded hybrid nanoparticles for the treatment of cardiovascular diseases. Controlled Release Society*, July 20-24, 2013, Honolulu, HI.
58. Key J, **Aryal S**, Gentile F, Ananta JS, Zhong M, Decuzzi P. *Rationally designed discoidal PLGA-PEG nanoconstruct for cancer theranostics. Controlled Release Society* July 20-24, 2013, Honolulu, HI.
59. **Aryal S**, Hu CM, Zhang L. *Synthesis of novel platinum-based nanostructures for combinatorial drug delivery. 241st ACS meeting and Exposition*, March 24-29, 2012, San Diego, CA.
60. **Aryal S**, Hu CM, Zhang L. *Drug conjugation enables polymeric nanoparticles dual-drug delivery. 241st ACS National Meeting*, March 27-31, 2011, Anaheim, CA.
61. **Aryal S**, Hu CM, Zhang L. *Stimuli responsive conjugation enables nanoparticle dual-drug delivery. 8th International nanomedicine and drug delivery symposium from Laboratory to Clinical Reality, Nano DDS*, October 3-5, 2010, Omaha, NB.
62. Hu CM, **Aryal S**, Clawson C, Fang R., Zhang L. *Lipid-polymer hybrid nanocarriers for controlled drug delivery. 8th International nanomedicine and drug delivery symposium from Laboratory to Clinical Reality, Nano DDS*, October 3-5, 2010, Omaha, NB.
63. Zhang L, **Aryal S**, Hu C.M. *Synthesis of acid responsive polymer-cisplatin prodrug conjugate nanoparticles for controlled drug delivery. 239th ACS National Meeting*, March 2010, San Francisco, CA.
64. Zhang L, Hu CM, Sartor M, Corbin C, Pornpattananangkul D, **Aryal S**. *Half-antibody targeted lipid-polymer hybrid nanoparticles for pancreatic cancer therapy. 239th ACS National Meeting*, March 2010, San Francisco, CA.
65. **Aryal S**, Bhattarai SR, Remant BKC, Khil MS, Kim HY. *Thiol-gold interaction and stability of cysteine capped gold nanoparticles. Young Scientist Symposium*, September 29, 2006, Chonbuk National University, Jeonju, Korea.

66. **Aryal S**, Remant BKC, Kim CK, Kim HY. *Fabrication of hydroxyapatite using different nano-matrices. The polymer Society of Korea*, April 6-7, 2006, Seoul, Korea.
67. **Aryal S**, Remant BKC, Khil MS, Kim HY. *Photo-chemical stabilization of gold nanoparticles. The 7th International Symposium on Nanocomposite and Nanoporous materials (ISNAM 7)*, February 15-17, 2006, Gyeongju, Korea.
68. **Aryal S**, Remant BKC, Bhattarai SR, Khil MS, Kim HY. *Polyvinyl alcohol scavenger for photocatalytic deposition of gold nanoparticles on electrospun MgTiO₃ ceramic nanofibers, The 3rd IUPAC-sponsored International Symposium on Macro and Supramolecular Architectures and Materials (MAM-06)*, May 28- June 1, 2006, Tokyo, Japan.
69. **Aryal S**, Remant BKC, Dharmaraj N, Bhattarai N, Kim CH, Kim HY. *Characterization of S-Au interaction in cysteine capped gold nanoparticles. 16th international symposium on Surfactants in solution (SIS 2006)* Seoul, Republic of Korea.
70. **Aryal S**, Remant BKC, Bhattarai N, Lee BM, Kim HY. *Thiol stabilized gold nanoparticles for labeling the poly (ϵ - Caprolactone) nanocarrier. 2006 International Symposium on Healthcare Technology Development*, January 19–21, 2006, Chonbuk National University, Jeonju, Korea.
71. **Aryal S**, Prabu P, Kim CK, Khil MS, Kim HY. *Organic matrix mediated synthesis of hydroxyapatite. International Fiber Conference*, May 30-June 3, 2006, Korea.
72. Remant BKC, Bhattarai SR, **Aryal S**, Khil MS, Kim HY, Lee DR. *Synthesis and characterization of ABA types tri-block copolymers derived from p-dioxanone, ϵ -caprolactone, and poly(ethylene glycol). IUPAC International Symposium on Advanced Polymers for Emerging Technologies*, October 10-13, 2006, Busan, Korea BEXCO.
73. Remant BKC, **Aryal S**, Bhattarai SR, Lee BM, Lee DR, Kim HY. *Gold nanoparticles stabilized by amine functionalized diblock copolymer. The 7th International Symposium on Nanocomposite and Nanoporous materials (ISNAM 7)*, February 15-17, 2006, Gyeongju, Korea.
74. Remant BKC, **Aryal S**, Bhattarai SR, Kim HY, Lee DR. *Synthesis of hydroxyapatite crystals using modified chitosan-capped gold nanoparticles as a scaffold. The polymer Society of Korea*, April 6-7, 2006, Seoul, Korea.
75. Remant BKC, Bhattarai SR, **Aryal S**, Khil MS, Kim HY. *Synthesis and characterization of a novel biodegradable amphiphilic block copolymers for biomedical application. The 3rd IUPAC-sponsored International Symposium on Macro and Supramolecular Architectures and Materials (MAM-06)*, May 28– June 1, 2006, Tokyo, Japan.
76. Bhattarai SR, **Aryal S**, Khil MS, Hwang PH, Kim HK. *Design of scaffolds using multi-layering electrospinning technique for blood vessel tissue engineering. International Fiber Conference*, May 2006, Seoul, South Korea.
77. Kim HY, **Aryal S**, Bhattarai SR, Remant BKC, Prabu P. *Carboxylated carbon nanotubes assisted hydroxyapatite synthesis from simulated body fluid. Material Research Society (MRS) Spring Meeting Symposium*, April 17-21, 2006, San Francisco, CA.
78. Remant BKC, Bhattarai SR, **Aryal S**, Khil MS, Dharmaraj N, Kim HY. *Novel triblock copolymeric micelle containing etoposide: Synthesis and characterization. 2006 International Symposium on Healthcare Technology Development*, January 19–21, 2006, Chonbuk National University, Jeonju, Korea.
79. Bhattarai SR, Remant BKC, **Aryal S**, Khil MS, Kim HY. *Surface modification of iron oxide nanoparticles with N-acylated chitosan. 16th international symposium on Surfactants in solution (SIS 2006)*, Seoul, Republic of Korea.
80. Remant BKC, Bhattarai SR, **Aryal S**, Khil MS, Kim HY. *Physiochemical properties of amine functionalized poly(ethylene glycol)-b-poly(caprolactone) copolymers. 16th international symposium on Surfactants in solution (SIS 2006)*, Seoul, Republic of Korea.

81. Bhattarai SR, **Aryal S**, Remant BKC, Keun HY, Hwang PH, Kim HY. *Cysteine capped gold nanoparticles for DNA delivery*. Society for Biomaterials, 2006 Annual Meeting, April 26-29, Pittsburgh, PA.
88. **Aryal S**, Remant BKC, Dharmaraj N, Kim HY, Choi KE. *Growth of hydroxyapatite crystals using carbon nano tubes as a matrix*. Particles 2005, August 13-16, 2005, CA.
89. Bhattarai SR, Remant BKC, **Aryal S**, Kim SY, Yi HY, Hwang PH, Kim HY. *Hydrophobically modified N-acylated chitosan gold nanoparticles for DNA Delivery*. Particles 2005, August 13-16, 2005, CA.
90. Remant BKC, **Aryal S**, Bhattarai SR, Kim CH, Kim SZ, Kim HY. *Stabilization of gold nanoparticles by hydrophobically modified polycations*. The Polymer Society of Korea, October 13-14, 2005, Jeju, South Korea.

Professional Activities

A. Professional Affiliations (Members of)

- American Chemical Society
- American Association of College of Pharmacy
- Nepal Chemical Society
- Biomedical Engineering Society
- Polymer Society of Korea

B. Thesis Advisor

1. Thesis Title: Synthesis and characterization of polymeric nanoparticles to enhance cellular drug delivery..
Student: rahma Aly, Department of Chemistry, University of Texas at Tyler.
Degree Awarded: MS (2024)
2. Thesis Title: Engineering synthetic and natural vesicular system for tumor-targeted drug delivery
Student: Sagar Rayamajhi, Department of Chemistry, Kansas State University, Manhattan, KS
Degree Awarded: Ph. D. (2021)
3. Thesis Title: Design strategies and application of stimuli-responsive nanoparticles for cancer diagnosis and therapy.
Student: Ramesh Marasini, Department of Chemistry, Kansas State University, Manhattan, KS
Degree Awarded: Ph. D. (2020)
4. Thesis Title: Efforts Toward Synthesis of Stimuli Responsive Platinum (IV) Micelles for Programmed Drug Delivery.
Student: Cesar B. Aparicio López, Department of Chemistry, Kansas State University, Manhattan, KS.
Degree Awarded: Chemistry Major, BS (2020).
5. Thesis Title: Engineering nanoparticles using chemical and biological approaches for tumor targeted delivery.
Student: Ms. Tuyen Nguyen, Department of Chemistry, Kansas State University, Manhattan, KS.
Degree Awarded: PhD (2019).
6. Thesis Title: Synthesis and characterization of pH-sensitive liposome to maximize drug delivery in cancer.
Student: Ms. Jessica Marchitto (Visiting Scholar- Department of Pharmacy, University of "G. d' Annuzio, Chieti-Pescara). Successfully completed her Master's degree. She did her master's research/thesis in our lab.

Degree Awarded: MS (2019)

7. Thesis Title: Synthesis and characterization of alendronate functionalized poly(l-lactide) polymers for engineering bone tumor-targeting nanoparticle.

Student: Mr. Soma Sekhar Sriadibhatla, Department of Chemistry, Kansas State University, Manhattan, KS.

Degree Awarded: MS (2016)

8. Thesis Title: Synthesis and characterization of lipid-polymer hybrid nanoparticles for combinatorial drug delivery.

Student: Ms. Kathy Stavropoulos, Department of Pharmaceutical Chemistry, University of Kansas, Lawrence.

Degree Awarded: MS (2011)

C. Journal Reviewed

Nano Letters, Journal of the American Chemical Society (JACS), Advance in Colloid and Surface Science, Langmuir, Biomacromolecules, Advanced Materials Letters, Journal of Peptide Science, Expert Opinion for Drug Delivery, Journal of Colloid and Interface Science, Current Topics in Medicinal Chemistry, ACS Applied Materials & Interfaces, Journal of Magnetism and Magnetic Materials, Colloids and Surfaces A: Physicochemical and Engineering Aspects, Journal of Materials, ACS Nano, Advanced Materials, Theranostics, Nanoscale, Journal of Drug Delivery Science and Technology, Journal of Controlled Release

D. Review Panel

- National Institute of Health, Cellular and Molecular Technologies, Special Emphasis Panel, 2024/05 ZRG1 MCST-M (80). 03/22/2024.
- National Cancer Institute Special Emphasis Panel, National Cancer Institute, TEP-3: SBIR Contract Review Meeting. (2023).
- National Cancer Institute Special Emphasis Panel, National Nanomedicine, ZRG1 Panel (2022).
- Department of Veterans Affairs, Hematology (HEMA) Panel (06/03/2022)
- National Science Foundation Meeting Name: FY21 CBET (1179) Nano Interactions Panel (2021)
- Marsden fund full grants, Royal Society Te Aprangi, Aotearoa - New Zealand (2021)
- Served as an international expert in evaluating Ph.D. Thesis from various countries.

E. Editorial and Advisory Boards

-International Journal of Polymeric Materials and Polymeric Biomaterials- 2016-present.

-Scientific Reports- 2016-present.

-Biomedicines-2020-present

-Editor: Smart Polymer Materials for Biomedical Applications. **2009** ISBN: 978-1-60876-192-0.

-Editor: Spectrum, **1996**, a publication published the activities of master's students at the Central Department of Chemistry, Tribhuvan University, Nepal.

H. Special Issue Editor:

1. Topic: Biomimetic Nanomedicine for Cancer Therapy and Diagnosis

Editor: **Santosh Aryal**

Status: Completed

Year of completion: 2022

Journal: Pharmaceutics (**Impact factor: 6.525**)

2. Topic: Topical Drug Delivery: Challenges, Opportunities, Novel Approaches and Recent Advances

Editors: **Santosh Aryal** and Pradeep Kumar Bolla

Status: Current

Journal: Biomedicines (**Impact factor: 4.757**)

3. Topic: Extracellular Vesicles for Early Cancer Diagnosis and Therapy

Editors: **Santosh Aryal** and Sagar Rayamajhi

Status: Current

Journal: Pharmaceutics (**Impact factor: 6.525**)

List of Students at UT-Tyler

Students Ongoing

1. Dr. Shoukath Sulthana (Postdoc, College of Pharmacy)-Ongoing
2. Dr. Viswanathan Sundaram (Postdoc, College of Pharmacy)-Ongoing
3. Macie Kirby (PharmD student, College of Pharmacy)-Ongoing
4. Israel Joshua Santhosh (Undergraduate, Department of Biology)-Ongoing
5. Troy Dane (Undergraduate, Department of Biology)-Ongoing
6. Sriyam Joshi ((Undergraduate, Department of Biology)-Ongoing
7. Anavya Jernigan (Undergraduate, Department of Chemistry and Biochemistry)-Ongoing

Students Completed

8. Dr. Jiri Trousil (Postdoc, Visiting Scholar, College of Pharmacy)-Completed
9. Anna Montero (Undergraduate, Department of Chemistry and Biochemistry)-Completed
10. Danyel Manteufel (Undergraduate, Department of Chemistry and Biochemistry)-Completed
11. Shelby Metcalf (Undergraduate, Department of Biology)-Completed
12. Prabhat Kattel (Undergraduate, Department of Biology)-Completed (Harvard Medical School)
13. Chandler Dark (Undergraduate, Department of Biology)-Completed
14. Angel Perez (Undergraduate, Department of Electrical Engineering)-Completed
15. Sajina Adhikari (Undergraduate, College of Nursing)-Completed
16. Rahma Aly (Graduated Spring 2024, Department of Chemistry and Biochemistry)
17. Dinesh Shrestha (Undergraduate, Department of Biology)-Harvard Medical School

High School student

1. Anthony Vega (Grade 11)
Goal: Educate and prepare next generation student in biomedical research