

Dongmao Zhang

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EDUCATION:

1987: BS. Chemistry, Wuhan University
2002: Ph.D. Department of Chemistry, Purdue University, West Lafayette, IN.
Dissertation Title: "Multivariate techniques for processing Raman Spectral Data"
Advisor: Prof. Dor Ben-Amotz.

ACADEMIC APPOINTMENTS:

2014-Present Associate Professor, Department of Chemistry, Mississippi State University
2008-2014 Assistant Professor, Department of Chemistry, Mississippi State University
2006- 2008 Research Scientist, Laboratory for Nanophotonics, Rice University, Houston. TX.
(Advisor, Prof. Naomi Halas)
2004 -2005 Research Scientist, The Bindley Bioscience Center, Purdue University, West Lafayette, IN.
2003- 2004 Assistant Research Scientist, Department of Chemistry, Purdue University, West Lafayette, IN
2002- 2003 Research Associate, Department of Chemistry, Purdue University, West Lafayette, IN

NON-ACADEMIC POSITION

2005- 2006 Analytical Chemist. GE Plastics, Washington, WV

PROFESSIONAL AFFILIATIONS:

The American Chemical Society

HONORS AND AWARDS

- Top ten most prolific authors in the recent five years for the Journal of the Physical Chemistry C by American Chemical Society (2017)
- Dean's Eminent Scholar Award of 2015 (College of Arts & Sciences at MSU)
- Faculty Research Award of 2013 (Office of Research, MSU)
- Faculty Research Award of 2013 (College of Arts & Sciences at MSU).
- NSF CAREER Award, 2012.
- State Pride Award. Mississippi State University (2012)
- Mississippi State University A&S Researcher of the Month (December 2011)
- NRC NIH/NIST Joint Postdoctoral Fellowship (2006), Award declined for position at Prof. Halas's group at Rice).
- GE Plastic Quarterly Leadership Award –Expertise (First Quarter 2006)
- GE Plastic Quarterly Leadership Award –Imagination (Third Quarter 2006)

MEMBERSHIPS

Member of the American Chemical Society

SYNERGISTIC ACTIVITIES:

- Serve as a peer reviewer for the following journals:
Nano Letters; Journal of American Chemical Society; Small; Journal of Physical Chemistry Letter; Langmuir, Journal of Physical Chemistry B/C; Analytical Chemistry; Journal of Environmental Science and Technology, ACS Applied Material and Interfaces; Analyst; Analytical and Bioanalytical Chemistry; Analytical Biochemistry; Journal of Raman Spectroscopy; Journal of Nanoparticle Research; Journal of Biomedical Optics; Applied Spectroscopy.

- NSF Panelist and Ad Hoc Reviewer; Ad Hoc reviewer for Polish Science Foundation.

ISSUED AND PENDING PATENTS

Issued Patents

1. Zhang, D.; Ben-Amotz, D.; Davisson, V. J.; Mrozek, M.; Ortiz, C.. Process and apparatus for segregation and testing by spectral analysis of solid deposits derived from liquid mixtures. **US7283228**
2. Drachev, V.; Shalaev, V.; Zhang, D.; Ben-Amotz, D. Plasmonic and/or microcavity enhanced optical protein sensing. **US7298474**

Patents submitted to USPTO

1. Zhang, D.; Davisson, V. J.; Ben-Amotz, D.; Xie, Y., Quantitative proteomics with isotopic substituted Raman active labeling.
2. Halas, N.; Zhang, D.; Barhoumi, A. Composition for targeted drug delivery and controlled release.
3. Aoune B.; Zhang, D.; Halas, N. Device and method for label-free detection of DNA hybridization.

Provisional Patents

1. Zhang, D. "Accessory for Raman and luminescence spectroscopic acquisitions"
2. Zhang, D. "Stealth Drug Delivery through Ligand Displacement".
3. Zhang, D. "Instruments, Methods, and Uses of Ratiometric Resonance Synchronous Spectrophotometers"
4. Zhang, D. "Reagent, device, and instrument for polarized Resonance Synchronous Spectroscopy".

PEER-REVIEWED PUBLICATIONS

Publications at MSU since Aug. 2008

1. Athukorale S.; Xu J.; Y. Zhou.; S. Zou,* and Zhang, D.*(2017) "Quantification of the Gold Nanoparticle Photon Extinction, Scattering, an Absorption Cross-section and Scattering Depolarization Spectra as Functions of Nanoparticle Geometry, Solvent Compositions, Ligand Functionalization, and Nanoparticle Aggregations" **Under review.**
2. Athukorale S.; Y. Zhou.; S. Zou, and Zhang, D.*(2017) "*Determination of the Liquid Light Scattering Cross-sections and Depolarization Spectra using Polarized Resonance Synchronous Spectroscopy*". **Under review.**
3. Perera G.; Athukorale S.; LaCour A.; Perez, F.; Gadogbe, M.; and Zhang, D.*(2017) "Facile Displacement of Citrate Residues from Gold Nanoparticles". **Under revision.**
4. Perera G.; Athukorale S.; Perez, F.; Gadogbe, M.; and Zhang, D.*(2017) "*Reactive Ag⁺ Adsorption onto Gold*". **Under revision.**
5. Siriwardana K.; Vithanage, B.; Y. S. Zou, and Zhang, D.*(2017). "*Quantification of the Depolarization and Anisotropy of Fluorophore Stokes-Shifted Fluorescence, On-Resonance Fluorescence, and Rayleigh-Scattering*". **Analytical Chemistry**, 89, 6686
<http://pubs.acs.org/doi/pdf/10.1021/acs.analchem.7b00907>
6. Perera G.; Nettles C.; Perez, F.; and Zhang, D.* (2016) "*Counter-ion Effects on Electrolyte Binding to Nanoparticles*". **Journal of Physical Chemistry C**. 120, 23604
<http://pubs.acs.org/doi/pdf/10.1021/acs.jpcc.6b07885>
7. Siriwardana K.; Nettles C.; Vithanage, B.; Y. Zhou.; S. Zou, and Zhang, D.*(2016). "*On-resonance Fluorescence, Resonance Rayleigh Scattering, and Ratiometric Resonance Synchronous Spectroscopy of Molecular- and Quantum Dot-Fluorophores*". **Analytical Chemistry**, 88, 9199,
<http://pubs.acs.org/doi/abs/10.1021/acs.analchem.6b02420>
8. Perera G.; Gadogbe M.; Alahakoon, S.; Zhou Y.; Zou, S.; Perze, F.; and Zhang, D.* (2016) "*Ion Pairing as the Main Pathway for Reducing Electrostatic Repulsion among Organothiolate Self-*

- assembled on Gold Nanoparticles in Water.*” **Journal of Physical Chemistry C**, 120, 19878, <http://pubs.acs.org/doi/abs/10.1021/acs.jpcc.6b07466>
9. Nettles C.B.; Zhou Y.; Zou S.; and Zhang, D.* (2016) “*UV-vis Ratiometric Resonance Synchronous Spectroscopy for Determination of Molecular and Nanoparticle Optical Cross-sections*”. **Analytical Chemistry**, 88, 2891-2898 <http://pubs.acs.org/doi/abs/10.1021/acs.analchem.5b04722> .
 10. Suwandaratne N.; Hu, J.; Siriwardana, K.; Gadogbe, M.; and Zhang, D.*(2016). “*Evaluation of Thiol Raman Activities and pK_a Values using Internally-referenced Raman-based pH Titration.*” **Analytical Chemistry**. 88, 3624-3631 <http://pubs.acs.org/doi/abs/10.1021/acs.analchem.5b04241>
 11. Gadogbe M.; Zhou Y.; Zou, S.; and Zhang, D.* (2016) “*Rigid single carbon-carbon bond that doesn't rotate in water*”. **Journal of Physical Chemistry C**, 120, 2418-2422 <http://pubs.acs.org/doi/pdf/10.1021/acs.jpcc.5b12166>
 12. Siriwardana, K.; LaCour, A.; and Zhang, D.* (2016). “*Critical Sequence Dependence in Multicomponent Ligand Binding to Gold Nanoparticles*” **Journal of Physical Chemistry C**. 120, 6900-6905. <http://pubs.acs.org/doi/abs/10.1021/acs.jpcc.6b01202>
 13. Sameera, K, Zhang, D.* (2015). “*Undergraduate student laboratory experimental modules for probing nanoparticle interfacial Interactions*”, **Journal of Chemical Education**. 92, 1924–1927 <http://pubs.acs.org/doi/abs/10.1021/acs.jchemed.5b00535>
 14. Siriwardana K.; Suwandarate N.; Perera G.; Collier W.; Perez, F.; and Zhang, D.* (2015). “*Contradictory Dual Effects: Organothiol induced both silver nanoparticle disintegration and formation under ambient conditions*” **Journal of Physical Chemistry C**, 119, 20975-20984. <http://pubs.acs.org/doi/abs/10.1021/acs.jpcc.5b05965>
 15. Siriwardana K.; Wang, A.; Gadogbe, M.; Collier, W.; Fitzkee, N.; and Zhang, D.* (2015). “*Probing the effect of cysteine residue on protein interactions with silver nanoparticles*”. **Journal of Physical Chemistry C**. 119, 2910–2916 <http://pubs.acs.org/doi/abs/10.1021/jp512440z>
 16. Perea, G. S.; LaCour A.; Hu, S.; Chen, M.; Zou, S.; Pittman, C. U. and Zhang, D.* (2015). “*Iodide-induced organothiol desorption and photochemical reaction, gold nanoparticle (AuNP) fusion, and SERS signal reduction in organothiol-containing AuNP aggregates*” **Journal of Physical Chemistry C**. 119, 4261-4267. <http://pubs.acs.org/doi/full/10.1021/jp512168z>
 17. Gadogbe, M.; Chen, M.; Zhang, D.*(2015). “*Can para-aryl-dithiols cross-link two plasmonic noble nanoparticles as monolayer dithiolate spacers?*” **Journal of Physical Chemistry C**, 119, 6626-6633. <http://pubs.acs.org/doi/abs/10.1021/acs.jpcc.5b00293>
 18. Zhang, D*.; Nettles C. (2015). “*A generalized model on the effects of nanoparticles on fluorophore fluorescence in solution*” **Journal of Physical Chemistry C**, 119, 7941-7948. <http://pubs.acs.org/doi/abs/10.1021/acs.jpcc.5b00597>
 19. Nettles, C. B.; Hu, J.; and Zhang, D*. (2015). “*Using Water Raman Intensity to determine the effective excitation and emission path lengths of fluorophotometers for correcting fluorescence inner filter effect*” **Analytical Chemistry**, 87, 4917. <http://pubs.acs.org/doi/abs/10.1021/acs.analchem.5b00513>
 20. Shi, Q.S.*; Che, W.; Liang, K.; Xia, C.; and Zhang, D. (2015). “*Phase transitions of carbon-encapsulated iron oxide nanoparticles during the carbonization of cellulose at various pyrolysis temperatures*” **Journal of Analytical and Applied Pyrolysis**, 115, 1-6. <http://www.sciencedirect.com/science/article/pii/S0165237015300437>
 21. Gadogbe, M. Zhou, Y.; Alakakoon, S. H.; Perera, G.; Zou, S.; Pittman, C. U.; and Zhang, D.* (2015). “*Structures and Conformations of Alkanedithiols on Gold and Silver Nanoparticles in Water*” **Journal of Physical Chemistry C**, 119, 18414-18421. <http://pubs.acs.org/doi/abs/10.1021/acs.jpcc.5b05514>

22. Perera, G.; Nettles, C.; Zhou, Y.; Zou, S.; Hollis, K.; and Zhang, D. * (2015). “Direct Observation of Ion Pairing at the Liquid/Solid Interfaces by Surface Enhanced Raman Spectroscopy” **Langmuir**, 31, 8998-9005. <http://pubs.acs.org/doi/pdf/10.1021/acs.langmuir.5b01903>.
23. Che, W.; Shi, S.Q.*; Zhang, D.; Jiang, D.; Barnes, M. H. (2014). “Structure of Cellulosic Fiber-Derived Carbon Catalyzed by Iron Oxide Nanoparticles”. **Wood and Fiber Science**. 46, 237-246.
24. Wang, A.; Vangala K.; Vo, T.; Zhang, D.; and Fitzkee, N.* (2014). “A Three-step Model for Protein-Gold Nanoparticle Adsorption”. **Journal of Physical Chemistry C**. 118, 8134-8142. <http://pubs.acs.org/doi/abs/10.1021/jp411543y>
25. Perera, G.; Ansar, S.; Hu, S.; Chen, M. Zou, S.; Pittaman, C.; and Zhang, D.* (2014). “Ligand Desorption and Desulfurization on Silver Nanoparticles using Sodium Borohydride in Water.” **Journal of Physical Chemistry C**. 118, 10509-10518. <http://pubs.acs.org/doi/abs/10.1021/jp5025526>
26. Siriwardana, K.; Gadogbe, M.; Ansar, S.; Vasquez, E.; Collier, W.; Zou, S.; Walter, K.; and Zhang, D* (2014). “Ligand Adsorption and Exchange on Pegylated Gold Nanoparticles”. **Journal of Physical Chemistry C**. 118, 11111-11119. <http://pubs.acs.org/doi/abs/10.1021/jp501391x>
27. Gadogbe, M.; Ansar, S.; Chu, I.; Zou, S.; and Zhang, D.* (2014). “Comparative Study of Gold and Silver Nanoparticle Self-assembly onto Thiophene Oil”. **Langmuir**, 30, 11520-11527. <http://pubs.acs.org/doi/abs/10.1021/la502574p>
28. Ameer, F.; Zhou, F, Zou, S.; and Zhang, D*(2014). “Wavelength-dependent Correlations between UV-Vis Intensities and SERS Enhancement Factors of Aggregated Gold and Silver Nanoparticles”. **Journal of Physical Chemistry C**. 118, 22234-22242. <http://pubs.acs.org/doi/abs/10.1021/jp5073395>
29. Ansar, S.; Gadogbe, M.; Siriwardana, K.; Howe, J.; Dogel, S.; Hosseinkhannazer, H.; Collier, W.; Rodriguez, J.; Zou, S.; and Zhang, D* (2014). “Dispersion Stability, Ligand Structure and Conformation, and SERS Activities of 1-Alkanethiol Functionalized Gold and Silver Nanoparticles. **Journal of Physical Chemistry C**. 118, 24925-24934. <http://pubs.acs.org/doi/abs/10.1021/jp507142v>
30. Gadogbe, M.; Ansar, S.M.He, G.; Collier, W.E.; Rodriguez, J.; Liu, D.; Chu, I.; Zhang, D.* (2013). “Determination of Colloidal Gold Nanoparticle Surface Areas, Concentrations, and Diameters through Quantitative Ligand Adsorption”. **Analytical and Bioanalytical Chemistry**, 405, 413-422.
31. Ameer, F.; Ansar, S.M.; Wang, H.; Zou, S.; Zhang, D* (2013). “Robust and Reproducible Quantification of SERS Enhancement Factors using a Combination of Time-Resolved Raman Spectroscopy and Solvent Internal Reference Method.” **Journal of Physical Chemistry C**. 117, 3483-3488. <http://pubs.acs.org/doi/abs/10.1021/jp311752m>
32. Vangala, K.; Siriwardana, K.; Vasquez, E.; Xin Y.; Pittman, C.U; Zhang, D.* (2013). “Simultaneous and Sequential Protein and Organothiol Interactions with Gold Nanoparticles”. **Journal of Physical Chemistry C**. 117, 1366-1374. <http://pubs.acs.org/doi/abs/10.1021/jp310085u>
33. Ansar, S. M; Ameer, F. S.; Hu, W.; Zou, S.; Pittman, C. U.; Zhang, D*(2013), “Removal of Molecular Adsorbates on Gold Nanoparticles Using Sodium Borohydride in Water”, **Nano Letters**, 13(3), 1226-1229 <http://pubs.acs.org/doi/abs/10.1021/nl304703w>
34. Ansar, S.; Perera, G.; Jiang, D.; Holler R.; Pittman, C.; and Zhang, D*. (2013). “Organothiols Self-Assembled Onto Gold: Evidence for Deprotonation of the Sulfur-Bound Hydrogen and Charge-Transfer from Thiolate” **Journal of Physical Chemistry C**, 117, 8793-8798 <http://pubs.acs.org/doi/abs/10.1021/jp312836q>
35. Ansar, S. M.; Perera, G.; Ameer, F. S.; Zou, S.; Pittman, C. U.; Zhang, D* (2013)., “Desulfurization of Mercaptobenzimidazole and Thioguanine on Gold Nanoparticles using Sodium Borohydride in Water at Room Temperature”, **Journal of Physical Chemistry C**, 117, 13722-13729 <http://pubs.acs.org/doi/abs/10.1021/jp403932w>

36. Siriwardana, K.; Wang, A.; Vangala, K.; Fitzkee, N.; Zhang, D.* (2013). "Probing the Effects of Cysteine Residues on Protein Adsorption onto Gold Nanoparticles using Wild-type and Mutated GB3 Proteins". *Langmuir*. 29, 10990-10996. <http://pubs.acs.org/doi/abs/10.1021/la402239h>
37. Ansar, S.M.; Perera, G.; Salomons, G.; Pittman, C.U.; Zou, S.; Zhang, D.* (2013). "Mechanistic Studies of Reactive Continuous Organothiol Interaction with Silver Nanoparticles". *Journal of Physical Chemistry C*. 117, 27146-27154. <http://pubs.acs.org/doi/abs/10.1021/jp4090102>
38. Ameer, F.; Collier, W.; Zhang, D.* (2013). "Quantification of Resonance Raman Enhancement Factors for Rhodamine 6G (R6G) in Water and Adsorbed onto Gold and Silver Nanoparticles". *Journal of Physical Chemistry C*. 117, 27096-27104. <http://pubs.acs.org/doi/abs/10.1021/jp4105932>
39. Vangala K.; Ameer F. Salomons, G. Le, V.; Lewis, E.A; Liu D.; Yu, L.; Zhang, D.* (2012). "Studying Protein and Gold Nanoparticle Interaction Using Organothiols as Molecular Probes", *Journal of Physical Chemistry C*.116, 3645-3652. <http://pubs.acs.org/doi/abs/10.1021/jp2107318>
40. Ansar, S.; Li, X.; Zou, S.; Zhang, D.* (2012) "Quantitative Comparison of Raman Activities, SERS Activities, and SERS Enhancement Factors of Organothiols: Implication to Chemical Enhancement". *Journal of Physical Chemistry Letter*. 3, 560-565. <http://pubs.acs.org/doi/abs/10.1021/jz2016439>
41. Zhang, D*; Shi, S.; Pittman,C.U.; Moore, K.L. Howie, J.Y (2012). "A Versatile and Biomass Synthesis of Iron-based Nanoparticles Supported on Carbon Matrix with High Iron Content and Tunable Reactivity". *Journal of Nanoparticle Research*.14, 1023-1034, <http://link.springer.com/article/10.1007%2Fs11051-012-1023-1>
42. Ameer, F.; Ansar, S.M.; Wang, H.; Zou, S.; Zhang, D.* (2012). "Effect of Gold Nanoparticle Inner Filtration on the Surface Enhanced Raman Spectroscopic Measurements". *Analytical Chemistry*, 84, 8437-8441. **Editors' Highlight**. <http://pubs.acs.org/doi/abs/10.1021/ac302073f>
43. Zhang, D; *Vangala, K.; Li S.; Yanney., M.; Xia, H.; Zou, S.; Sygula, A. (2011) "Acid cleavable surface enhanced raman tagging for protein detection." *Analyst*, 136, 520-526. <http://pubs.rsc.org/en/content/articlepdf/2011/AN/C0AN00708K>
44. Ansar, S.M.; Haputhanthri, R.; Edmonds, B.; Liu, D.; Yu, L.; Sygula, A.; Zhang, D.*. (2011) "Determination of the Binding Affinity, Packing, and Conformation of Thiolate and Thione Ligands on Gold Nanoparticles." *Journal of Physical Chemistry C*. 115, 653-660. <http://pubs.acs.org/doi/abs/10.1021/jp110240y>
45. Zhang, D*; Ansar, S.M. (2010) "Ratiometric Surface Enhanced Raman Quantification of Ligand Adsorption onto a Gold Nanoparticle". *Analytical Chemistry*. 82(13), 5910-5914. <http://pubs.acs.org/doi/abs/10.1021/ac1010124>
46. Zhang, D.*; Ansar, S.M.; Vangala, K. (2010) "Protein adsorption drastically reduces SERS signal of dye molecule", *Journal of Raman Spectroscopy*, 41(9). 952-957. <http://onlinelibrary.wiley.com/doi/10.1002/jrs.2548/epdf>
47. Zhang, D.*; Vangala, K.; Jiang, D.; Pechan, T.; Zou, S.; (2010) "Raman Spectroscopy of Fluorescein Isothiocyanate Labeled Protein". *Applied Spectroscopy*. 64, 1078-1085. <http://www.ncbi.nlm.nih.gov/pubmed/20925976>
48. Zhang, D.*; Haputhanthri, R.; Ansar, S.M.; Vangala, K.; De Silva, H.I.; Sygula, A.; Saebo, S.; Pittman, C.U., Jr. (2010) "Ultrasensitive Surface Enhanced Raman Detection of Malondialdehyde", *Analytical and Bioanalytical Chemistry*. 398, 3193-3201. <http://link.springer.com/article/10.1007%2Fs00216-010-4225-3>
49. Vangala, K.; Yanney, M.; Hsiao, C.T; Wu, W.W.; Shen, R.F.; Zou, S.; Sygula, A.; Zhang, D.*. (2010) "Sensitive Carbohydrate Detection Using Surface Enhanced Raman Tagging." *Analytical Chemistry*, 82(24), 10164-10171 <http://pubs.acs.org/doi/abs/10.1021/ac102284x>

50. Zhang, D.*; Jiang, D.; Yanney, M.; Zou, S.; Sygula, A.;(2009) “Ratiometric Raman Spectroscopy for quantification of protein oxidation damage”. *Analytical Biochemistry*, 391(2), 121-126.
<http://www.sciencedirect.com/science/article/pii/S0003269709003340>
51. Zhang, D.; Neumann, O.; Wang, H.; Yuwono, V.; Barhoumi, A.; Perham, M.; Hartgerink, J.; Wittung-Stafshede, P.; Halas, N. J.* (2009) Gold nanoparticles can induce the formation of protein-based aggregates at physiological pH" *Nanoletter*, 9(2), 666-671.
52. Kundu, J.; Neumann, O.; Janesko, B., Zhang, D.; Lal S.; Barhoumi, A.; Scuseria, G. Halas, N.* (2009), “Adenine- and adenosine monophosphate (AMP)-gold binding interactions studies by surface enhanced Raman and infrared spectroscopies” *Journal of Physical Chemistry C*. 113(32), 14390-14397
53. Neumann, O.;Zhang,D.; Tam, F.; Lal, S.; Wittung-Stafshede, P. Halas, N.* (2009) “Direct Optical Detection of Aptamer Conformational Changes Induced by Target Molecules.” *Analytical Chemistry*, 81 (24), 10002-10006.
54. Barhoumi, A.; Zhang, D.; Tam, F.; Halas, N. J.* (2008) Surface-Enhanced Raman Spectroscopy of DNA.*Journal of the American Chemical Society* , 130, 5523-5529.
55. Wei, F.; Zhang, D.; Halas, N. J.*; Hartgerink, J. D.* (2008) Aromatic Amino Acids Providing Characteristic Motifs in the Raman and SERS Spectroscopy of Peptides.*Journal of Physical Chemistry B* ,112, 9158-9164.
56. Barhoumi, A.; Zhang, D.; Halas, N. J.* (2008) Correlation of Molecular Orientation and Packing Density in a dsDNA Self-Assembled Monolayer Observable with Surface-Enhanced Raman Spectroscopy.*Journal of the American Chemical Society*.130, 14040-14041.
57. Xie, Y.; Zhang, D.; Ben-Amotz, D.* (2008) Protein-ligand binding detected using ultrafiltration Raman difference spectroscopy. *Analytical Biochemistry*, 373(1), 154-160
58. Ortiz, C.; Zhang, D.*;Ribbe, A.E.; Xie, Y.; Ben-Amotz, D*. (2007), Analysis of insulin amyloid fibrils by Raman spectroscopy. *Biophysical Chemistry* 128(2-3), 150-155.
59. Ortiz, Corasi; Zhang, D.*; Xie, Yong; Ribbe, A.E.; Ben-Amotz, D.*.(2006) “Validation of the drop coating deposition Raman method for protein analysis.”*Analytical Biochemistry*, 353(2), 157-166.
60. Zhang, D.; Ortiz, C.; Xie, Y.; Davisson, V. J.; Ben-Amotz, D.* (2005) Detection of the site of phosphorylation in a peptide using Raman spectroscopy and partial least squares discriminant analysis. *SpectrochimicaActa, Part A: Molecular and Biomolecular Spectroscopy*, 61A, 471-475.
61. Zhang, D.*;Xie, Y.; Deb, S. K.; Davison, V. J.; Ben-Amotz, D. (2005) Isotope Edited Internal Standard Method for Quantitative Surface-Enhanced Raman Spectroscopy. *Analytical Chemistry*, 77, 3563-3569.
62. Mrozek, M. F.; Zhang, D.; Ben-Amotz, D.*(2004) Oligosaccharide identification and mixture quantification using Raman spectroscopy and chemometric analysis. *Carbohydrate Research* 339, 141-145.
63. Loethen, Y. L.; Zhang, D.; Favors, R. N.; Basiaga, Sara B. G.; Ben-Amotz, D.* (2004) Second-derivative variance minimization method for automated spectral subtraction. *Applied Spectroscopy*, 58, 272-278.
64. Xie, Y.; Zhang, D.; Jarori, G. K.; Davisson, V. J.; Ben-Amotz, D.* (2004) The Raman detection of peptide tyrosine phosphorylation.*Analytical Biochemistry*, 332, 116-121.
65. Ortiz, C.; Zhang, D.;Xie, Y.; Davisson, V. J.; Ben-Amotz, D.* (2004) Identification of insulin variants using Raman spectroscopy.*Analytical Biochemistry*, 332, 245-252.
66. Zhang, D.;Mrozek, M. F.; Xie, Y.; Ben-Amotz, D.* (2004) Chemical segregation and reduction of Raman background interference using drop coating deposition. *Applied Spectroscopy*, 58, 929-933.
67. Zhang, D.;Xie, Y.; Mrozek, M. F.; Ortiz, C.; Davisson, V. J.; Ben-Amotz, D.* (2003) Raman detection of proteomic analytes. *Analytical Chemistry*, 75, 5703-5709.
68. Zhang, D.; Hanna, J. D.; Ben-Amotz, D.* (2003) Single scan cosmic spike removal using the upper bound spectrum method.*Applied Spectroscopy*, 57, 1303-1305.
69. Drachev, V. P.; Thoreson, M.; Khaliullin, E. N.; Sarychev, A. K.; Zhang, D.; Ben-Amotz, D.; Shalaev, V. M.* (2003) Semicontinuous silver films for protein sensing with SERS. *Proceedings of SPIE-The International Society for Optical Engineering*, 5221, 76-81.
70. Zhang, D.; Ben-Amotz, D.* (2002) Removal of cosmic spikes from hyper-spectral images using a hybrid upper-bound spectrum method.*Applied Spectroscopy*, 56, 91-98.

71. Zhang, D.; Hanna, J. D.; Jiang, Y.; Ben-Amotz, D.* (2001) Influence of laser illumination geometry on the power distribution advantage. *Applied Spectroscopy*, 55, 61-65.
72. Cai, T. T.; Zhang, D.; Ben-Amotz, D.* (2001) Enhanced chemical classification of Raman images using multiresolution wavelet transformation. *Applied Spectroscopy*, 55, 1124-1130.
73. Zhang, D.; Jallad, K. N.; Ben-Amotz, D.* (2001) Stripping of cosmic spike spectral artifacts using a new upper-bound spectrum algorithm. *Applied Spectroscopy*, 55, 1523-1531.
74. Zhang, D.; Ben-Amotz, D.* (2000) Enhanced chemical classification of Raman images in the presence of strong fluorescence interference. *Applied Spectroscopy*, 54, 1379-1383.

BOOK CHAPTERS

Ortiz, C.; Xie, Y.; Zhang, D.; Ben-Amotz, D.; Chapter 5: "Proteomic Applications of Drop Coating Deposition Raman Spectroscopy" in "New Approaches in Biomedical Spectroscopy", Editor, Kneipp et al. 2007, Oxford University Press. ISBN13: 9780841274372

INVITED TALKS (Since Fall 2008)

1. "Bioanalytical Raman Spectroscopy"
Digital biology learning community
MSU Campus, September 2, 2009
2. "Bioanalytical Raman and Surface Enhanced Raman Spectroscopy"
Department of Chemistry and Biochemistry, Jackson State University
Jackson, MS. October 9, 2009
3. "Quantitative Protein Characterization using Drop Coating Deposition Raman Spectroscopy".
Symposium.
2010 FACSS Annual Conference.
Raleigh, NC, October 21, 2010.
4. "Experimental Investigation of Molecular-Level Ligand Interfacial Interaction with Gold Nanoparticles"
Interdisciplinary Center for Nanotoxicity, Jackson State University.
Jackson, MS. January 27, 2012
5. "Quantitative Surface Enhanced Raman Spectroscopy" Symposium
Annual Symposium of Mississippi Academy of Science,
Hattiesburg, MS. Feb 22, 2012.
6. "Probing Protein and Organothiol interaction with Gold Nanoparticles"
Department of Sciences and Mathematics, Mississippi University for Women.
Columbus, MS. March 28, 2012.
7. "Molecular-level Interfacial Interaction of Gold Nanoparticles"
College of Chemistry, Central China Normal University
Wuhan, China. June 11, 2012.
8. "Molecular-level Interfacial Interaction of Gold Nanoparticles"
College of Pharmacy, Tianjin Medical University
Tianjin, China. June 19, 2012.
9. "Quantitative Surface Enhanced Raman Spectroscopy"
Department of Chemistry and Biochemistry, The University of Mississippi.
Oxford, MS. September 6, 2012.
10. "Quantitative Surface Enhanced Raman Spectroscopy, Challenges and Opportunities"
Department of Chemistry, University of Alabama at Birmingham
Birmingham, AL. Nov. 15, 2012.
11. "Molecular-level interfacial interactions with gold and silver nanoparticles in water"
Department of Chemistry, Jackson State University
Jackson, MS. Sept. 12, 2013
12. "Quantitative Surface Enhanced Raman Spectroscopy, Challenges and Opportunities"
Department of Chemistry, University of New York at Buffalo
Buffalo, New York. Nov. 12, 2013
13. "On the possibility of the para-aryl-dithiols cross-linking plasmonic nanoparticles as dithiolates."

- The 249th American Chemical Society National Meeting
March 22-26, 2015, Denver, Colorado)
14. “Dispersion stability, phase partitioning, and ligand adsorption of plasmonic gold and silver nanoparticles”.
The 250th ACS National Meeting
August 16-20, 2015. Boston, Massachusetts,
 15. “Quantitative Surface Enhanced Raman Spectroscopy”
College of Science, Huazhong Agriculture University
Wuhan, Hubei, June 8, 2016
 16. “Ratiometric Resonance Synchronous Spectroscopy (R2S2), a new measurement technique for material characterization and analysis”.
College of Chemistry, Wuhan University
Wuhan, Hubei, June, 9, 2016
 17. “Ratiometric Resonance Synchronous Spectroscopy (R2S2), a new measurement technique for material characterization and analysis”.
College of Chemistry, Sichuan University
Chengdu, Sichuan, June 13, 2016
 18. “Ratiometric Resonance Synchronous Spectroscopy (R2S2), a new measurement technique for material characterization and analysis”.
College of Chemistry and Chemical Engineering, Southwest University
Chongqing, June 14, 2016
 19. “Molecular-level interfacial interactions of plasmonic gold and silver nanoparticles”.
College of Resources and Environment, Southwest University
Chongqing, June 15, 2016
 20. “Thiolate to Disulfide Conversion Driven by Hydration and Dehydration”.
The 3rd Hydrophobicity Workshop
July 12-16, 2016, at Telluride, CO.
 21. “Ratiometric Resonance Synchronous Spectroscopy, A New Platform Technique for Material Characterization”.
Department of Chemistry, Jackson State University
Jackson, MS. July 27, 2016
 22. “Ratiometric Resonance Synchronous Spectroscopy, A New Platform Technique for Material Characterization”.
Department of Chemistry, University of Southern Mississippi,
Hattiesburg, MS. February 9, 2017
 23. “Quantification of the photon extinction, absorption, scattering, and on-resonance fluorescence of nanoparticles using polarized resonance synchronous spectroscopy”.
254th ACS fall conference, Washington DC. August 20, 2017

CONFERENCE TLKS AND STUDENT AWARD-WINNING POSTERS SINCE 2008

1. Zhang, D.; Zou, S.; Yanney, M. Sygula, A.; “Ratiometric Raman spectroscopy of protein oxidative damage”. 238th ACS National Meeting, Washington, DC. August 16-20, 2009
2. Haputhanthri, R.; Zhang, D.; “Detection of Thiobarbituric acid reactive compounds using Surface enhanced Raman Spectroscopy”, Louisville, KY, Oct. 18-22, 2009 (Best Poster Award Winner)
3. Ansar, S.M. Zhang, D. “Comparison of protein and dye interaction with noble metal nanoparticles” 2009 FACSS, Louisville, KY, Oct. 18-22, 2009
4. Vangala, K.; Ansar, S.; Zhang, D.; “Drop coating deposition Raman Spectroscopy of FITC-labeled protein”, FACSS Louisville, KY, Oct. 18-22, 2009.
5. Ansar, S.; Zhang, D.. “Quantitative study of ligand adsorption onto metal nanoparticle using surface enhanced Raman internal reference method”. FACSS Raleigh, NC, Oct 17-21, 2010
6. Vangala K. Yanney, M. Sygula, A. Zhang, D. “Acid cleavable tagging for biomolecule analysis” 2010 FACSS. Raleigh, NC, Oct 17-21, 2010.

7. Vangala K. Zhang, D., Yanney, M. Sygula, A. "Glycomic quantification using Surface enhanced Raman Tagging Method" Raleigh, NC, Oct 17-21, 2010.
8. Vangala, K.; Zhang, D. "Toward multimode carbohydrate characterization using surface enhanced Raman tagging." 2010 Joint SE/SW Regional ACS Meeting, Dec. 1-Dec. 04, 2011.
9. Haputhanthri, R.; Zhang, D. "The SERS spectrum of thiobabitoric acid exhibits drastic pH and concentration dependence." 2010 Joint SE/SW Regional ACS Meeting, Dec. 1-Dec. 04, 2011.
10. Ansar, S.; Zhang, D. "Determination of ligand conformation on gold nanoparticles using quantitative surface enhanced Raman spectroscopy". 2010 Joint SE/SW Regional ACS Meeting, Dec. 1-Dec. 04, 2011.
11. Zhang, D.; Vangala K.; Ameer F. Salomons, G. Le, V.; Lewis. "Going for the gold: Organothiols can penetrate the protein-stabilizing layer of BSA-stabilized gold nanoparticle and be adsorbed onto the gold surface." 242th ACS National Meeting, Denver, CO. Aug. 28-Sept. 1, 2011
12. Zhang, D.; Li, X.; Nettles, C. "Competitive equilibrium ligand adsorption onto gold nanoparticle for organothiol quantification" 242th ACS National Meeting, Denver, CO. Aug. 28-Sept. 1, 2011
13. Zhang, D. Vangala K.; "Understanding the protein binding with gold nanoparticles using organothiols as molecular probes". 244th ACS National Meeting, Philadelphia, Pennsylvania, Aug. 19-23, 2012. (Accepted oral presentation)
14. Zhang, D.: "Quantitative surface enhanced Raman spectroscopy". 244th ACS National Meeting, Philadelphia, Pennsylvania, Aug. 19-23, 2012.
15. Vangala, K.; Zhang, D. "Competitive Organothiol and Protein Adsorption onto Gold Nanoparticles" SCIX 2012, Sept. 30-Oct. 5, Kansas City, MO.
16. Gadogbe, M.; Zhang, D.: "Determination of colloidal gold nanoparticle surface areas, concentrations, and sizes through quantitative ligand adsorption." SCIX 2012 (FACSS conference), Sept. 30-Oct. 5, Kansas City, MO.
17. Ansar, S.; Zhang, D. "Experimental and computational investigation of SERS signal variations" SCIX 2012 (FACSS conference), Sept. 30-Oct. 5, Kansas City, MO.
18. Ameer, F.; Ansar, S.M.; Wang, H.; Zou, S.; Zhang, D. "Determination of the absolute SERS enhancement factors using solvent as internal references". SCIX 2012, Sept. 30-Oct. 5, Kansas City, MO. (Best Student Poster Award Winner)
19. Zhang, D. "Robust and reproducible quantification of SERS enhancement factors using combination of time-resolved Raman spectroscopy and solvent internal reference." 245th ACS National Meeting & Exposition, New Orleans, LA, United States, April 7-11, 2013 (2013), COLL-717.
20. Zhang, D: Comparative study of organothiol adsorption, desorption, and reactions on gold and silver nanoparticles in water. 248th ACS National Meeting & Exposition, San Francisco, CA, United States, August 10-14, 2014 (2014), COLL-419.
21. Zhang, D. "Modeling and quantitative decoupling nanoparticle near- and far-field effects on fluorophore fluorescence in solutions" 250th ACS National Meeting & Exposition, Boston, MA, United States, August 16-20, 2015
22. Zhang, D.: "Generalized model on the effects of nanoparticle on fluorophore fluorescence in solution." 2015 PacificChem December 15-20, 2015, Honolulu, Hawaii.

AWRDED PROPOSALS:

Awarded Proposal (total \$868,840.00)

1. **Title:** "Stealth drug delivery through ligand displacement", Seed grant.
Agency: Henry Family Research Fund—New direction seed grant. Role: PI. Awarded amount: \$5000. Dates: 9/1/2015-8/31/2016
2. **Title:** Towards fundamental understanding of structure, dispersion stability, and oil/water/solid phase transition of aryl para-dithiol functionalized gold and silver nanoparticles
Agency: Mississippi EPSCoR seed grant. Role: PI. Awarded amount: \$86,000. Dates: 9/1/2014-8/31/2016
3. **Title:** CAREER Ultra-Sensitive and Accurate Quantification of Protein Carbonyl Formation using Ratiometric Cleavable SERS Tags.

- Agency: NSF. Role: PI. Awarded amount: \$599,000. Dates: 7/1/2012-3/31/2018
4. **Title:** Nanoengineering Biologically-Active Surface Enhanced Raman Spectroscopic Tags for Ultrasensitive and convenient Food Pathogen Detections.
Agency: MSU, Food Safety Initiative. Role: PI. Awarded amount: \$30,000. Dates: 04/1/2014-3/31/2015
 5. **Title:** Understanding Mercaptobenzimidazole (MBI) Adsorption, Desorption, and Reaction on Silver Nanoparticles in Water
Agency: Mississippi ESPCoR Seed Grant. Role: PI. Awarded amount: \$43,000. Dates: 9/1/2013-8/31/2014
 6. **Title:** *Listeria Monocytogenes* Sorting and Quantification Using Multiplex Surface Enhanced Raman spectroscopic Tagging
Agency: MSU, Food Safety Initiative. Role: PI. Awarded amount: \$49,966. Dates: 04/1/2013-3/31/2014
 7. **Title:** Experimental and computational study of the AuNP inner filtration and optical damping effects.
Agency: Mississippi ESPCoR Seed Grant. Role: PI. Awarded amount: \$43,000. Dates: 9/1/2012-8/31/2013
 8. **Title:** Deciphering the drastic pH and concentration dependence of the SERS spectrum of thiobarbituric acid.
Agency: Mississippi ESPCoR Seed Grant. Role: PI. Awarded amount: \$28,874. Dates: 9/1/2011-8/31/2012
 9. **Title:** Towards a surface enhanced Raman platform for glycomic analysis.
Agency: MSU. Role: PI. Awarded amount: \$10,000. Dates: 9/1/2009-8/31/2010
 10. \$17,000 Subaward from CAVS in 2010 for biomass conversion

STUDENTS ADVISED:

Former Graduate Students (7 PhD and 4 MS)

Kathikeswar Vangala (PhD in 2012); Pravindya Haputhranthri (MS in 2012); Siyam Ansar (Ph.D in 2013); Hao Xia (MS in 2013); Fathima Ameer (Ph.D in 2014); Manuel Gadogbe (Ph.D in 2016); Nuwanthi Suwandaratne (MS in 2016); Charles Nettles (Ph.D in 2016); Sandamini Heshani (MS in 2016) Ganganath Perera (PhD in 2017); Kumudu Siriwardana (PhD in 2017);

Current Graduate Students (10)

Sumudu Athukorale (Ph.D student); Chathurangi Buddhini (PhD student); Niroshani Abeynayake (PhD student); Maleesha De Silva (PhD Student); Prakash Khanal (PhD Student); Joanna Xu (PhD Student); Ayodeji Olukoya (MS Student)

Former and Current Postdoc/ Visiting Scholar:

Dr. Shaoyong Li, Currently an Associate Professor in Tianjin Medical University
Dr. Jiangrong Zhang from Southwest University in China
Dr. Rui Li from Southwest University in China

Current and previous undergraduate students (number of co-authored publications)

Bradley Edmonds (one);	George Salomons (two);	Felicia Wang;	Charles Nettles;
Thomas Rick;	Niraj K. Palsule;	Daniela Sanchez;	Catherine Feng;
Elizabeth Stafford (one);	Ronald LaCour (two)		