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Education

- 2011 Ph.D in analytical chemistry, Louisiana State University, Baton Rouge, LA
(Research advisor: Prof. Jayne C. Garno)
Dissertation: *Dynamic Measurements with Scanning Probe Microscopy: Surface Studies using Nanostructured Test Platforms of Metalloporphyrins, Nanoparticles and Amyloid Fibrils.*
- 2002 M.Sc. Analytical Chemistry, Moi University, Kenya
(Research advisor: Prof. Jackson Sanga)
Thesis: *Determination of Heavy Metals in Plant Effluents, Dam Tailings, Fluorspar Ores, Soils, Rocks and in the River(s). A Case Study of Kerio, Kenya.*
- 1997 B.Sc. Chemistry, University of Nairobi, Kenya (Research advisor: Prof. M. Hussein)
Research project: *Biodegradation of Phenols and Chlorophenols using Pseudomonas Bacteria.*

Professional and Teaching Experience

Associate Research Scientist, Texas A&M Univ., Materials Characterization Facility	2012-present
Research Assistant, Louisiana State University (In Prof. Jayne C. Garno lab)	2006-2011
Teaching Assistant, Louisiana State University, Chemistry 2001, 2002, 4553	2006-2009
Chemistry 3493, Physical Chemistry Lab, Developed an SPM laboratory (4 semesters)	2006-2011
Chemistry 3900, REU/HHMI undergraduate mentor (4 students: Joey Tauzin, Holly Guerrero, G. Castro, M. Goita)	2007-2011
Solution Assistant, Louisiana State University, Chemistry 2364	2005-2006
Lecturer at Masinde Muliro University of Science & Technology, Kenya Taught General Chemistry to University freshmen.	2002-2005

Honors and Awards

- 2011 Robinson Award, for excellence in analytical chemistry research and teaching, Baton Rouge, LA
- 2011 Advancing Science Travel Award (NOBCCHE) Houston, TX
- 2010 Coates Travel Award PACIFICHEM Meeting, Honolulu, HI
- 2010 Best Student Poster Award, Society for Applied Spectroscopy, Pittcon, Orlando, FL
- 2009 Best Poster Award ACS 238th National Meeting, Washington, DC
- 2009 Coates Travel Award, MRS International Meeting, Boston, MD
- 2009 Graduate Student Travel Stipend, National ACS Meeting, Washington, DC
- 2009 James G. Traynham Distinguished Graduate Student Award, LSU, Baton Rouge, LA
- 2008 Advancing Science Travel Award (NOBCCHE) Philadelphia, PA
- 2007 Graduate Student Travel Stipend, ACS-SWRM, Lubbock, TX
- 2006 Best Poster Award (*co-author*) 53rd AVS International Symposium, San Francisco, CA
- 2006 Best Poster Award (*co-author*) ACS 231st National Meeting, Atlanta, GA

Publications

1. Saner, K. C.; Lusker, K. L.; LeJeune, Z. M.; **Serem, W. K.**; Garno, J. C. Self-assembly of octadecyltrichlorosilane: Surface structures formed using different protocols of particle lithography. *Beilstein J. Nanotechnol.* **2012**, *3*, 114–122.
2. Nalin de Silva, K. M.; Hwang, E.; **Serem, W. K.**; Fronczek, F. R.; Garno, J. C.; Nesterov, E. E. Long-Chain 3,4-Ethylenedioxythiophene/Thiophene Oligomers and Semiconducting Thin Films Prepared by Their Electropolymerization. *ACS Appl. Mater. Interfaces* **2012**, *4*, 5430-5441.
3. Lahasky, S.; Guo, L; **Serem, W. K.**; Garno, J. C.; Donghui, Z. Synthesis and Characterization of Cyclic Brush-Like Polymers by N-Heterocyclic Carbene-Mediated Zwitterionic Polymerization of N-Propargyl N-Carboxyanhydride and the Grafting-to Approach. *Macromolecules*, **2011**, *44*, 9063-9074.
4. Lyles, V. D.; **Serem, W. K.**; Garno, J. C. Surface Characterization Using Atomic Force Microscopy (AFM) in Liquid Environments. *Invited chapter for Surface Analytical Techniques*, Editors: G. Bracco (Genoa, Italy) B. Holst (Bergen, Norway)., **2011**, 599-620.
5. Tian, T.; LeJeune, Z. M.; **Serem, W. K.**; Yu, J.-J.; Garno, J. C. Nanografting: a method for bottom-up fabrication of designed nanostructures. *Invited chapter for Tip-Based Nanofabrication*, by *Ampere Tseng*. **2011**, 167-205.
6. Daniels, S. L.; **Serem, W. K.**; Garno, J. C. Investigating structural and physical properties of ferritin and its uses as a biomineralization nanomaterial using scanning force microscopy. *Invited chapter for Journal of Nanoscience Letters*, **2011**, *2*, 14.
7. Bett, C. K.; Ngunjiri, J. N.; **Serem, W. K.**; Hammer, R. P.; McCarley, R.; Garno, J. C Structure-Activity Relationships in Peptide Modulators of Amyloid β -Protein Aggregation: Variation in α,α -Disubstitution Results in Altered Aggregate Size and Morphology, *ACS Chemical Neuroscience*, **2010**, *1*, 608-626.
8. **Serem, W. K.**; Bett, C. K.; Ngunjiri, J. N.; Hammer, R. P.; Garno, J. C. Growth, Evolution and Self-Aggregation of β -Amyloid Fibrils Studied with AFM, (*invited*) *Microscopy Research & Technique*, **2011**, *74*, 699-708.
9. **Serem, W. K.**; Lusker, K. L.; Garno, J. C. Using Scanning Probe Microscopy to Characterize Nanoparticles and Nanocrystals. *Invited chapter for Encyclopedia of Analytical Chemistry*, Supplementary Volumes S1-S3, edited by Robert A. Meyers. Chichester, UK: John Wiley & Sons, Ltd., **2011**, 859-894.
10. Kelley, A. T.; Ngunjiri, J. N.; **Serem, W. K.**; Lawrence, S. O.; Yu, J.-J.; Crowe, W.; Garno, J. C. Applying AFM-based nanofabrication for measuring the thickness of nanopatterns: The role of headgroups in vertical self-assembly of ω -functionalized *n*-alkanethiols. *Langmuir*, **2010**, *26*, 3040-3049.
11. Bett, C. K.; **Serem, W. K.**; Fontenot, K. R.; Hammer, R. P.; Garno, J. C. Effects of peptides derived from terminal modifications of the A β central hydrophobic core on A β fibrillization, *ACS Chemical Neuroscience*, **2010**, *1*, 661-678.
12. LeJeune, Z. M.; **Serem, W. K.**; Kelley, A. T.; Ngunjiri, J. N.; Garno, J. C. AFM-based Nanofabrication with Self-Assembled Monolayers, invited chapter for *Encyclopedia of Nanoscience and Technology*, (2nd edition). Ed. H. S. Nalwa, American Scientific Publishers Stevenson Ranch, CA (*invited*), **2011**, *11*, 147-170.
13. Ngunjiri, J. N.; Daniels, S. L.; Li, J.-R.; **Serem, W. K.**; Garno, J. C. Controlling the arrangement of proteins on surfaces using particle lithography (*invited*) *Nanomedicine*, **2008**, *3(4)*, 529-541.
14. **Serem, W. K.**; Varotto, A.; Castro, G.; Drain, C. M.; Garno, J. C. Investigation of the vibrational response of individual nanoparticles using AFM with magnetic sample modulation. Proceedings, National Organization of Black Chemists and Chemical Engineers (NOBCCHE) Annual Conference, Philadelphia, PA, **2008**.

15. Ngunjiri, J. N.; Kelley, A. T.; LeJeune, Z. M.; Li, J.-R.; Lewandowski, B.; **Serem, W. K.**; Daniels, S. L.; Lusker, K. L.; Garno, J. C. Achieving precision and reproducibility for writing patterns of *n*-alkanethiol SAMs with automated nanografting. (*invited*) *Scanning, The Journal of Electron Microscopies* **2008**, *30*, 123.
16. Hao, E.; Sibrian-Vazquez, M.; **Serem, W. K.**; Garno, J. C.; Fronczek, F. R.; Vicente, M. G. H. Synthesis, Aggregation and Cellular Investigations of Porphyrin-Cobaltacarborane Conjugates. *Chemistry, A European Journal*, **2007**, *13*, 9035-9042.

Manuscripts (*in preparation*)

17. Kelley, A. T.; Daniels, S. L.; **Serem, W. K.**; LeJeune, Z. M.; Flurry, N.; Chan, J. Y.; Garno, J. C. Vibrational response of iron(III)-nickel nanoparticles to the flux of a modulated electromagnetic field detected by contact-mode atomic force microscopy, *to be submitted to Chemistry of Materials*.
18. **Serem, W. K.**; Castro, G.; Varotto, A.; Drain, C. M.; Garno, J. C. Vibrational response of DNA-templated metal nanoparticles using magnetic sample modulation AFM, *in preparation*.
19. **Serem, W. K.**; Kelley, A. T.; Tesfai, A.; Warner, I. M.; Garno, J. C. Magnetic Properties of Ionic Liquid Nanoparticles Investigated using Contact-Mode AFM Combined with Magnetic Sample Modulation, *in preparation*.
20. **Serem, W. K.**; Goita, M.; Hao, E.; Vicente, M. G. H.; Garno, J. C. Characterization of Cobaltacarborane Porphyrins using Current Sensing AFM, *in preparation*.
21. **Serem, W. K.**; Hao, E.; Vicente, M. G. H.; Garno, J. C. Applying Magnetic Sample Modulation-AFM to Induce Selective Vibration of Octa-Substituted Cobaltacarborane Porphyrin Nanocrystals, *in preparation*.
22. Englade, L. E.; Daniels, S. L.; **Serem, W. K.**; Garno, J. C. Dynamic Magnetic Characterizations at the Nanoscale: A New Mode for AFM Imaging with Magnetic Sample Modulation (MSM/AFM). *Invited chapter for Scanning Probe Microscopy in Nanoscience and Nanotechnology*, Vol. III, Edited by B. Bhushan, Springer-Verlag, Heidelberg, *in preparation*.

Research Presentations (*first-author*)

1. Dynamic Characterizations of Metalloporphyrin Nanocrystals Using Magnetic Sample Modulation and Contact-Mode Atomic Force Microscopy. **Serem, W. K.**; Hao, E.; Vicente, M. G. H.; Garno, J. C. Federation of Analytical Chemistry and Spectroscopy Societies, Reno, NV (10/2011).
2. New Dynamic Characterizations of Metallo-Porphyrin Nanocrystals Using Magnetic Sample Modulation and Contact-Mode Atomic Force Microscopy. **Serem, W. K.**; Hao, E.; Vicente, M. G. H.; Garno, J. C. 38th Annual Conference of The National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCCChE) Houston, TX (4/2011).
3. Combining magnetic sample modulation with contact mode atomic force microscopy to investigate vibrational responses of magnetic nanoparticles. **Serem, W. K.**; Varotto, A.; Castro, G.; Drain, C. M.; Kelley, A. T.; Garno, J. C. PACIFICHEM Conference, Honolulu, HI (12/2010).
4. Investigation of the Magnetic Properties of FeNi₃ Nanoparticles Using Contact-Mode AFM Combined with Magnetic Sample Modulation. **Serem, W. K.**; Kelley, A. T.; Xu, S.; Garno, J. C. Pittcon 2010, Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Orlando, FL (3/2010).
5. Surface structures formed by octa-substituted cobaltacarborane porphyrin investigated by scanning probe microscopy. **Serem, W. K.**; Hao, E.; Vicente, M. G. H.; Garno, J. C. Materials Research Society (MRS) 2009 Fall Meeting, Boston, MA (12/2009).
6. Characterization of the vibrational response of DNA-templated metal nanoparticles using magnetic sample modulation AFM. **Serem, W. K.**; Varotto, A.; Castro, G.; Drain, C. M.; Garno, J. C.

- American Chemical Society 238th National Meeting, Division of Colloid and Surface Chemistry, Washington, DC (8/2009).
7. Magnetic properties of microstructures of iron(III)-nickel nanoparticles investigated by contact-mode AFM combined with magnetic sample modulation. **Serem, W. K.**; Goita, M.; Kelley, A. T.; Xu, S.; Verberne-Sutton, S.; Garno, J. C. Southeast Regional Meeting of the American Chemical Society, SERMACS 2008, Nashville, TN (11/2008).
 8. Magnetic properties of metal nanoparticles investigated by AFM combined with magnetic sample modulation. **Serem, W. K.**; Goita, M.; Kelley, A. T.; Daniels, S. L.; Xu, S.; Garno, J. C. American Chemical Society 235th National Meeting, New Orleans, LA (4/2008).
 9. AFM Investigation of the Self-Assembly of Porphyrin-Cobaltacarborane Conjugates on Mica (0001). **Serem, W. K.**; Hao, E.; Vicente, M. G. H.; Garno, J. C. Pittcon 2008, 59th Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New Orleans, LA (3/2008).
 10. AFM Investigation of the Self-Assembly of Porphyrin-Cobaltacarborane Conjugates on Mica (0001). **Serem, W. K.**; Hao, E.; Vicente, M. G. H.; Garno, J. C. Pittcon 2008, 59th Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New Orleans, LA (3/2008).
 11. Characterization of the vibrational response of DNA-templated metal nanoparticles using magnetic sample modulation AFM. **Serem, W. K.**; Varotto, A.; Castro, G.; Drain, C. M.; Garno, J. C. ACS 238th National Meeting, Division of Colloid and Surface Chemistry, Washington, DC (8/2009).
 12. Investigation of the vibrational response of individual nanoparticles using AFM with magnetic sample modulation. **Serem, W. K.**; Varotto, A.; Castro, G.; Drain, C. M.; Garno, J. C. Oral presentation at the 35th Annual Conference of The National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCCHE) Philadelphia, PA (3/2008).
 13. AFM investigation of the self-assembly of porphyrin-cobaltacarborane conjugates on mica(0001). **Serem, W. K.**; Hao, E.; Fronczek, R. F.; Vicente, M. G. H.; Garno, J. C. 63rd Southwest Regional ACS meeting, Lubbock, TX (11/2007).
 14. AFM investigation of the self-assembly of porphyrin-cobaltacarborane conjugates on mica(0001). **Serem, W. K.**; Hao, E.; Fronczek, R. F.; Vicente, M. G. H.; Garno, J. C. Federation of Analytical Chemistry and Spectroscopy Societies National Meeting, FACSS, 2007, Memphis, TN (10/2007).
 15. NanoPen Reader and Writer (NPRW) with Reactive Self-Assembled Monolayers (SAMs). **Serem, W. K.**; Garno, J. C. Oral presentation SPM workshop with Agilent Technologies, Louisiana State University, Baton Rouge, LA (7/2007).
 16. Optimization of Lithographic Parameters for Writing Thiolated Molecules via Nanografting and NPRW using an Open-Loop AFM System. **Serem, W. K.**; Ngunjiri, J. N.; Garno, J. C. 53rd American Vacuum Society (AVS) International Symposium, San Francisco, California (11/2006).
 17. Identifying artifacts in SPM images caused by probes, scanners and data processing. **Serem, W. K.**; Brown, L.; Garno, J. C. American Chemical Society Southwest Regional Meeting, Houston, Texas (10/2006).
 18. Interpreting SPM images – how to identify artifacts in images that are caused by tip convolution, multiple tip asperities and software processing. **Serem, W. K.**; Garno, J. C. Center for Biomolecular Multi-scale Systems (CBMM) Colloquium, Baton Rouge, Louisiana (7/2006).

Undergraduate Research Presentations (*undergraduates supervised by WKS in blue font*)

1. Investigating the Size Dependent Properties of Silver Nanoparticles: an Undergraduate Laboratory. **Tauzin, L.**; Serem, W. K.; Garno, J. C. *Summer Undergraduate Research Forum*, Louisiana State University, Baton Rouge, LA (7/2010).
2. Magnetic Properties of FeNi₃ and Pd-Co Nanoparticles Investigated Using Contact-Mode AFM Combined with Magnetic Sample Modulation. **Tauzin, L.**; **Serem, W. K.**; Kelley, A. T.;

- Vercruyse, K.; Garno, J. C. American Chemical Society 239th National Meeting, San Francisco, CA (03/2010).
3. Characterization and nanolithography with FeNi₃ nanoparticles. **Guerrero, H. G.**; Serem, W. K.; Kelley, A. T.; Garno, J. C. Partnership for Research and Education in Materials Science (PREM) Workshop, *Ninth Annual Southern School on Material Science and Computational Chemistry*, Jackson State University, Jackson, MS (7/2009).
 4. Current-Sensing AFM Characterization of Cobaltacarborane Porphyrins. **Goita, M.**; **Serem, W. K.**; Hao, E.; Fronczek, R. F.; Vicente, M. G. H.; Garno, J. C. Southeast Regional Meeting of the American Chemical Society, SERMACS 2008, Nashville, TN (11/2008).
 5. Current-Sensing AFM Characterization of Cobaltacarborane Porphyrins. **Goita, M.**; **Serem, W. K.**; Hao, E.; Fronczek, R. F.; Vicente, M. G. H.; Garno, J. C. Poster presented at Louisiana State University for the Summer Undergraduate Research Forum (SURF), Baton Rouge, LA (8/2008).
 6. Nanopatterned arrays of rings of metal nanoparticles produced by particle lithography. **Castro, G.**; **Serem, W. K.**; Varotto, A.; Drain, C. M.; Garno, J. C. American Chemical Society, 235th National Meeting, New Orleans, LA (4/2008).
 7. AFM Investigation of the Magnetic Properties of Rings of Metal Nanoparticles Formed by Particle Lithography. **Castro, G.**; **Serem, W. K.**; Varotto, A.; Drain, C. M.; Garno, J. C. Poster presented at Louisiana State University for the Summer Undergraduate Research Forum (SURF), Baton Rouge, LA (7/2007).
 8. AFM Characterization of Silica-Coated Cobalt Nanoparticles. **Castro, G.**; Kelley, A. T.; **Serem, W.K.**; Daniels, S. L.; Russo, P.; Garno, J. C. NOBCCChE annual poster symposium, Baton Rouge, LA (4/2007).

Research Presentations (*co-authored*)

1. AFM Investigation of the Magnetic Properties of Ferritin Nanostructures. Daniels, S. L.; Ngunjiri, J. N.; **Serem, W. K.**; Xu, S.; Garno, J. C. Pittcon 2008, 59th Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New Orleans, LA (3/2008).
2. Achieving precision and reproducibility for writing patterns of *n*-alkanethiol self-assembled monolayers with automated nanografting. Johnpeter, J. N.; Kelley, A. T.; LeJeune, Z. M.; Li, J.-R.; Lewandowski, B.; **Serem, W. K.**; Daniels, S. L.; Lusker, K. L.; Garno, J. C. 63rd Southwest Regional ACS meeting, Lubbock, TX (11/2007).
3. Mapping the magnetic domains of ferritin using magnetic sample modulation. Daniels S. L.; Johnpeter, J. N.; **Serem, W. K.**; Garno, J. C. 63rd Southwest Regional ACS meeting, Lubbock, TX (11/2007).
4. Fabrication of magnetic nanoparticles using a plasmid DNA template. Varotto, A.; **Serem, W. K.**; Garno, J. C.; Drain, C. M. Poster for the American Chemical Society 235th National Meeting, Boston, MA (8/2007).
5. Protein immobilization on activated SAM nanopatterns produced by nanografting. Ngunjiri, J. N.; Li, J.-R.; **Serem, W. K.**; LeJeune, Z. M.; Dukes, R.; Garno, J. C. Award Winning Poster presentation at the American Chemical Society 231st National Meeting, Atlanta, GA (3/2006).
6. Biosurfaces Generated Using AFM-Based Nanolithography and Surface Activation Chemistry, Johnpeter Ngunjiri, Wilson Serem, Jayne C. Garno, 53rd American Vacuum Society (AVS) International Symposium, San Francisco, California (11/2006). *Biomaterials Interfaces symposium, Best Student Poster Award.*
7. Synthesis of Cyclic Brush-Like Polymers via Tandem Organo-Mediated Zwitterionic Polymerization and Click Chemistry. Lahasky, S. H.; **Serem, W. K.**; Guo, L.; Garno, J. Zhang, D. 67th Southwest Regional Meeting of the American Chemical Society, Austin, TX (11/2011).

8. Structural Changes of Octadecyltrichlorosilane Nanostructures in Liquid Environments: Molecular-Level Views of Surface Wetting. Kulkarni, S.; Lyles, V.; **Serem W.K.**; Jayne C. Garno. Pittcon, Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Orlando, FL (03/2012).
9. Synthesis and characterization of intermetallic nanoparticles: Evaluation of how size and composition influence magnetic properties. Englade, L. E.; Morrison, G.; **Serem, W. K.**; Daniels, S. L.; Chan, J. Y.; Garno, J. C. *International Chemical Congress of Pacific Basin Societies, PACIFICHEM 2010*, Honolulu, HA (12/2010).
10. Synthesis of Macro cyclic Brushes by a Combination of Ring-Expansion Polymerization and “Grafting-to” Approaches: Molecular-Level Studies Using Scanning Probe Microscopy. Lu, L.; Lahasky, S.; **Serem, W. K.**; Garno J. and Zhang D. Federation of Analytical Chemistry and Spectroscopy Societies (FACSS) 2010, Reno, NV (10/2011).
19. Conductive properties of cobaltacarborane porphyrin thin films investigated with conductive probe atomic force microscopy (poster). Lyles, V. D.; **Serem, W. K.**; Hao, E.; Vicente, M. G. H.; Garno, J. C.* *Federation of Analytical Chemistry and Spectroscopy Societies National Meeting, FACSS 2011*, Reno, NV (10/2011).
20. Nanostructures of designed cobaltacarborane porphyrins characterized with conductive probe atomic force microscopy: Investigation of structure-property relationships (poster). Lyles, V. D.; **Serem, W. K.**; Hao, E.; Vicente, M. G.H.; Garno, J. C. PACIFICHEM Conference, Honolulu, HI (12/2010).
21. Investigation of surface structures and charge transport of cobaltacarborane porphyrins with conductive probe atomic force microscopy (poster). Lyles, V. D.; **Serem, W. K.**; Hao, E.; Vicente, M. G.H.; Garno, J. C. FACSS 2010, 37th Federation of Analytical Chemistry and Spectroscopy Societies, Raleigh, NC (10/2010).