Saddam M. Muthana, PhD

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**Education**

Ph.D., Chemistry, University of California, Davis, CA 2009

M.S., Chemistry, California State University, Fresno, CA 2004

B.S., Chemistry, California State University, Fresno, CA 2003

**Professional Experience**

Director of Accreditation & Quality Assurance, Alfaisal University, Riyadh, KSA 2022-Present

Department Chair, Department of Chemistry, Alfaisal University, Riyadh, KSA 2017-2022

Acting Dean, COSGS, Alfaisal University, Riyadh, KSA May-Sept. 2016

Vice Dean for Academic & Student Affairs, COSGS, Alfaisal University, Riyadh, KSA 2015-2017

Assistant Professor of Chemistry, Alfaisal University, Riyadh, KSA 2014-Present

Postdoctoral Fellow, National Cancer Institute, NIH, Frederick, MD , USA 2010-2014

Lecturer, University of California, Merced, CA, USA 2009-2010

**Awards , Grants, and Professional Memberships**

* Outstanding Service Award, Alfaisal University, Riyadh, KSA 2022
* Faculty Award for Research Excellence, Alfaisal University, Riyadh, KSA 2021
* Internal Research Grant, Alfaisal University, Riyadh, KSA 2021
* Outstanding Teaching Award, Alfaisal University, Riyadh, KSA 2020
* KACST Research Grant, Riyadh, KSA 2019
* Outstanding Service Award, Alfaisal University, Riyadh, KSA 2016
* Internal Research Grant, Alfaisal University, Riyadh, KSA 2015
* Outstanding Teaching Assistant Award, University of California, Davis, CA 2009
* American Chemical Society 2003-Present

**Research Interests**

In the interface of chemistry and biology with focus on studying the roles and applications of carbohydrates, synthesis of advanced materials for targeted applications, environmental chemistry, sustainable chemistry, high-throughput screening, biomarker discovery, and nanotechnology & drug delivery.

**Teaching Experience**

Dr. Muthana has over 12 years of teaching experience in the United States of America (USA) and in the Kingdom of Saudi Arabia including general chemistry, organic chemistry, medicinal Chemistry, biochemistry, chemistry in the environment and everyday living, nanotechnology, and research seminars.

**Selected Publications** (listed chronologically)

1. Aloraij, Y.; Alsheikh, A.; Alyousef, R.; Alhamlan, F.; Suaifan, G.; **Muthana, S.M**; Al-Kattan, K.; Yu, H.; Zourob, M., Development of a rapid immuno-based screening assay for the detection of adenovirus in eye infections. *ACS Omega*, **2022**, 7, 21, 17555-17562.
2. Li, R.; Kooner, A.S. **Muthana, S.M**; Yuan, Y.; Yu, H.; Chen X., A chemoenzymatic synthon strategy for synthesizing N-acetyl analogues of O-acetylated N. meningitidis W capsular polysaccharide oligosaccharides. *JOC*, **2020**, doi.org/10.1021/acs.joc.0c02134.
3. **Muthana, S**. **M.** (**2020**). ‘Glycan microarray: Toward drug discovery and development’, in Tiwari, V.K. (1st Ed.) *Carbohydrates in Drug Discovery and Development: Synthesis and Applications*. Elsevier Science: pp 267-282.
4. Li, R.; Yu, H.; **Muthana, S.M**; Freedberg, D.I.; Chen X., Size-controlled chemoenzymatic synthesis of homogeneous oligosaccharides of Neisseria meningitidis W Capsular Polysaccharide. *ACS Catalysis*, **2020**, 10, 4, 2791-2798.
5. Zeng, J.; Zhang, R.; **Muthana, S**; Gao H.; Song, M.; Jia, T.; Jiang, J.; Cao, M.; Meng, K.; Sun, J., Enzymatic Synthesis of KDN-containing sialylated lactuloses and their bacteriostatic activities on *Staphylococcus aureus.* *J. Chem. Soc. Pak.,* **2019**, 41, 6, 1115-1124.
6. **Muthana, S.M.** and Gildersleeve, J.C. Factors affecting anti-glycan IgG and IgM repertoires in human serum. *Scientific Reports*, **2016**, 6, 19509; doi: 10.1038/srep1959.
7. **Muthana, S. M.**; Gulley, J.L.; Hodge, J. W.; Schlom, J.; Gildersleeve, J.C., ABO blood type correlates with survival on prostate cancer vaccine therapy. *Oncotarget,* **2015,** 6, 32244-32256.
8. **Muthana, S. M.**; Xia, L. Campbell, C.T.; Zhang, Y.; Gildersleeve, J.C., Competition between serum IgG, IgM, and IgA anti-glycan antibodies. *PLOS ONE,* **2015,** 10(3): e0119298.
9. **Muthana, S. M.**; Gildersleeve, J.C., Powerful tools for biomarker discovery. *Cancer biomarkers : section A of Disease markers* **2014,** *14* (1), 29-41.
10. Khedri, Z.; Li, Y.; **Muthana,** **S.**; Muthana, M.; Hsiao, C.; Yu, H.; Chen, X., Chemoenzymatic synthesis of sialosides containing C7-modified sialic acids and their application in sialidase substrate specificity studies. *Carbohydr. Res.* **2014**, 389, 100-111.
11. Zhang, Y.; **Muthana, S.** **M.**; Barchi, J. J., Jr.; Gildersleeve, J. C., Divergent behavior of glycosylated threonine and serine derivatives in solid phase peptide synthesis. *Org. Lett.* **2012,** *14* (15), 3958-3961.
12. Padler-Karavani, V.; Song, X.; Yu, H.; Hurtado-Ziola, N.; Huang, S.; **Muthana, S.**; Chokhawala, H. A.; Cheng, J.; Verhagen, A.; Langereis, M. A.; Kleene, R.; Schachner, M.; de Groot, R. J.; Lasanajak, Y.; Matsuda, H.; Schwab, R.; Chen, X.; Smith, D. F.; Cummings, R. D.; Varki, A., Cross-comparison of protein recognition of sialic acid diversity on two novel sialoglycan microarrays. *J. Biol. Chem.* **2012,** *287* (27), 22593-22608
13. Zhang, Y.; **Muthana, S. M**.; Farnsworth, D.; Ludek, O.; Adams, K.; Barchi, J. J., Jr.; Gildersleeve, J. C., Enhanced epimerization of glycosylated amino acids during solid-phase peptide synthesis. *J. Am. Chem. Soc.* **2012,** *134* (14), 6316-6325.
14. **Muthana, S. M.**; Campbell, C. T.; Gildersleeve, J. C., Modifications of glycans: biological significance and therapeutic opportunities. *ACS Chem. Biol.* 2012, 7 (1), 31-43.
15. Li, Y.; Yu, H.; Cao, H.; **Muthana, S.**; Chen, X., Pasteurella multocida CMP-sialic acid synthetase and mutants of Neisseria meningitidis CMP-sialic acid synthetase with improved substrate promiscuity. *Appl. Microbiol. Biotechnol.* 2012, 93 (6), 2411-2423.
16. Khedri, Z.; Muthana, M. M.; Li, Y.; **Muthana, S. M.**; Yu, H.; Cao, H.; Chen, X., Probe sialidase substrate specificity using chemoenzymatically synthesized sialosides containing C9-modified sialic acid. *Chem. Commun.* **2012,** *48* (27), 3357-3359.
17. Padler-Karavani, V.; Hurtado-Ziola, N.; Pu, M.; Yu, H.; Huang, S.; **Muthana, S.**; Chokhawala, H. A.; Cao, H.; Secrest, P.; Friedmann-Morvinski, D.; Singer, O.; Ghaderi, D.; Verma, I. M.; Liu, Y. T.; Messer, K.; Chen, X.; Varki, A.; Schwab, R., Human xeno-autoantibodies against a non-human sialic acid serve as novel serum biomarkers and immunotherapeutics in cancer. *Cancer Res.* **2011,** *71* (9), 3352-3363.
18. Ding, L.; Yu, H.; Lau, K.; Li, Y.; **Muthana, S.**; Wang, J.; Chen, X., Efficient chemoenzymatic synthesis of sialyl Tn-antigens and derivatives. *Chem. Commun.* **2011,** *47* (30), 8691-8693.
19. **Muthana, S.**; Yu, H.; Cao, H.; Cheng, J.; Chen, X., Chemoenzymatic synthesis of a new class of macrocyclic oligosaccharides. *J. Org. Chem.* **2009,** *74* (8), 2928-2936.
20. **Muthana, S.**; Cao, H.; Chen, X., Recent progress in chemical and chemoenzymatic synthesis of carbohydrates. *Curr. Opin. Chem. Biol.* **2009,** *13* (5-6), 573-581.
21. Cao, H.; **Muthana, S.**; Li, Y.; Cheng, J.; Chen, X., Parallel chemoenzymatic synthesis of sialosides containing a C5-diversified sialic acid. *Bioorg. Med. Chem. Lett.* **2009,** *19* (20), 5869-5871.
22. Cao, H.; Li, Y.; Lau, K.; **Muthana, S.**; Yu, H.; Cheng, J.; Chokhawala, H. A.; Sugiarto, G.; Zhang, L.; Chen, X., Sialidase substrate specificity studies using chemoenzymatically synthesized sialosides containing C5-modified sialic acids. *Org. Biomol. Chem.* **2009,** *7* (24), 5137-5145.
23. Wang, Z.; Gilbert, M.; Eguchi, H.; Yu, H.; Cheng, J.; **Muthana, S.**; Zhou, L.; Wang, P. G.; Chen, X.; Huang, X., Chemoenzymatic Syntheses of Tumor-Associated Carbohydrate Antigen Globo-H and Stage-Specific Embryonic Antigen 4. *Adv Synth Catal* **2008,** *350* (11-12), 1717-1728.
24. Li, Y.; Yu, H.; Cao, H.; Lau, K.; **Muthana, S.**; Tiwari, V. K.; Son, B.; Chen, X., Pasteurella multocida sialic acid aldolase: a promising biocatalyst. *Appl. Microbiol. Biotechnol.* **2008,** *79* (6), 963-970.
25. Cao, H.; Huang, S.; Cheng, J.; Li, Y.; **Muthana, S.**; Son, B.; Chen, X., Chemical preparation of sialyl Lewis x using an enzymatically synthesized sialoside building block. *Carbohydr. Res.* **2008,** *343* (17), 2863-2869.
26. **Muthana, S.**; Yu, H.; Huang, S.; Chen, X., Chemoenzymatic synthesis of size-defined polysaccharides by sialyltransferase-catalyzed block transfer of oligosaccharides. *J. Am. Chem. Soc.* **2007,** *129* (39), 11918-11919.
27. Chung, M.; **Muthana, S.**; Paluyo, R.; Hasson, A., Measurements of effective Henry’s law constants for hydrogen peroxide in concentrated salt solutions. *Atmos. Environ.* **2005**, 39 (16), 2981-2989.