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| **Saddam M. Muthana, PhD**  Director of Accreditation & Quality Assurance  Assistant Professor of Chemistry Office: +966-1-215-7717  College of Science & General Studies Mobile: +966-50-245-3252  Alfaisal University, Riyadh, KSA Email: [smuthana@alfaisal.edu](mailto:smuthana@alfaisal.edu) | Dr. Saddam M. Muthana |



**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

Director or Life Sciences Program, COSGS, Alfaisal University, Riyadh, KSA 2018-2022

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

Adjunct Assistant Professor, University of California, Merced, CA, USA Jun. 2010- Aug. 2010

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

Research Assistant, University of California, Davis, CA, USA 2005-2009

**Awards and Grants**

* PI: MOC Grant for Culinary Research Center (2,507,000 SAR), Riyadh, KSA 2022
* Outstanding Service Award, Alfaisal University, Riyadh, KSA 2022
* Faculty Award for Research Excellence, Alfaisal University, Riyadh, KSA 2021
* PI: Internal Research Grant, Alfaisal University (50,000 SAR), Riyadh, KSA 2021
* Outstanding Teaching Award, Alfaisal University, Riyadh, KSA 2020
* Co-PI KACST Research Grant (1,000,000 SAR), Riyadh, KSA 2019
* Outstanding Service Award, Alfaisal University, Riyadh, KSA 2016
* PI: Internal Research Grant, Alfaisal University (50,000 SAR), Riyadh, KSA 2015
* Outstanding Teaching Assistant Award, University of California, Davis, CA 2009

**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.

**Selected Publications** (listed chronologically)

1. Alanazi, S.; Rhouati, A.; Chrouda, A.; Cialla-May, D.; Popp, J.; **Muthana, S.**; Dasouki, M.; Zourob, M., Design of an innovative aptasensor for the detection of chemotherapeutic drug Fludarabine phosphate. Scientific Reports, **2024**, 14, 26300.
2. 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.
3. 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.
4. **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.
5. 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.
6. 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.
7. **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.
8. **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.
9. **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.
10. **Muthana, S. M.**; Gildersleeve, J.C., Powerful tools for biomarker discovery. *Cancer biomarkers : section A of Disease markers* **2014,** *14* (1), 29-41.
11. 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.
12. 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.
13. 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
14. 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.
15. **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.
16. 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.
17. 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.
18. 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.
19. 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.
20. **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.
21. **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.
22. 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.
23. 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.
24. 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.
25. 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.
26. 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.
27. **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.
28. 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.