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1 Van Herreweghe, F., Mao, J., Chaplen, F.W.R., Grooten, J., Gevaert, K., Vandekerckhove, J. and Vancompernelle, K. (2002) Tumor Necrosis Factor-induced modulation of glyoxalase I activities through phosphorylation by PKA results in cell death and is accompanied by the formation of specific methylglyoxal-derived AGEs. *Proc. Natl. Acad. Sci. USA*, 99(2):949-954. Doi:10.1073/pnas.012432399 2 Chaplen, F.W.R., Fahl, W.E., and Cameron, D.C. (1996) Effect of endogenous methylglyoxal on Chinese hamster ovary cells grown in culture. *Cytotechnology* 22:33-42. 3 Chumsae, C., Gifford, K., Lian, W., Liu, H., Radziejewski, C.H., and Zhou, Z.S. (2013) Arginine modifications by methylglyoxal: Discovery in a recombinant monoclonal antibody and contribution to acidic species. *Anal. Chem.* 85(23), 11401-11409

INCIDENCE AND POTENTIAL IMPLICATIONS OF METHYLGLYOXAL IN INDUSTRIAL CELL CULTURE REVISITED

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Methylglyoxal is a toxic by-product of glycolysis and amino acid metabolism in mammalian systems. The major route for methylglyoxal detoxification is the glyoxalase pathway, which consists of the enzymes glyoxalase I (GLO1) and glyoxalase II (GLO2). A required co-factor for the glyoxalase pathway is reduced glutathione. Evidence suggests that GLO1 and methylglyoxal have important roles to play in the signal pathways associated with oxidative stress and necrotic cell death¹. Previous work has demonstrated that growth conditions found in industrial cell culture have marked effects on endogenous methylglyoxal levels in Chinese hamster ovary (CHO)². Furthermore, decreased levels of methylglyoxal were associated with increased cell viability. More recently, this compound has been found to modify recombinant antibodies expressed in CHO at specific arginine residues³. Here, the implications of methylglyoxal are discussed in the context of past and current works relevant to industrial cell culture.

¹Van Herreweghe, F., Mao, J., Chaplen, F.W.R., Grooten, J., Gevaert, K., Vandekerckhove, J. and Vancompernelle, K. (2002) Tumor Necrosis Factor-induced modulation of glyoxalase I activities through phosphorylation by PKA results in cell death and is accompanied by the formation of specific methylglyoxal-derived AGEs. *Proc. Natl. Acad. Sci. USA*, **99**(2):949-954. Doi:10:1073/pnas.012432399

²Chaplen, F.W.R., Fahl, W.E., and Cameron, D.C. (1996) Effect of endogenous methylglyoxal on Chinese hamster ovary cells grown in culture. *Cytotechnology* **22**:33-42.

³Chumsae, C., Gifford, K., Lian, W., Liu, H., Radziejewski, C.H., and Zhou, Z.S. (2013) Arginine modifications by methylglyoxal: Discovery in a recombinant monoclonal antibody and contribution to acidic species. *Anal. Chem.* **85**(23), 11401-11409.