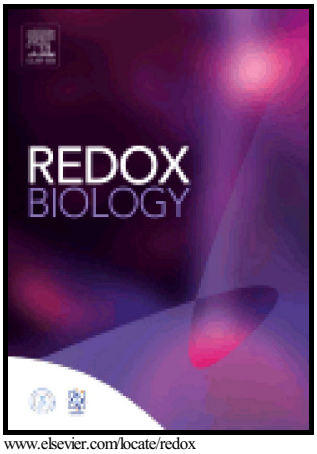

www.elsevier.com/locate/redox

MGST1, a GSH transferase/peroxidase essential for development and hematopoietic stem cell differentiation

Lars Bräutigam, Jie Zhang, Kristian Dreij, Linda Spahiu, Arne Holmgren, Hiroshi Abe, Kenneth D Tew, Danyelle M Townsend, Michael J Kelner, Ralf Morgenstern, Katarina Johansson

PII: S2213-2317(18)30151-4
DOI: https://doi.org/10.1016/j.redox.2018.04.013
Reference: REDOX908

To appear in: *Redox Biology*

Received date: 23 February 2018
Revised date: 10 April 2018
Accepted date: 13 April 2018

Cite this article as: Lars Bräutigam, Jie Zhang, Kristian Dreij, Linda Spahiu, Arne Holmgren, Hiroshi Abe, Kenneth D Tew, Danyelle M Townsend, Michael J Kelner, Ralf Morgenstern and Katarina Johansson, MGST1, a GSH transferase/peroxidase essential for development and hematopoietic stem cell differentiation, *Redox Biology,* https://doi.org/10.1016/j.redox.2018.04.013

MGST1, a GSH transferase/peroxidase essential for development and hematopoietic stem cell differentiation

Lars Bräutigam[1], Jie Zhang[2], Kristian Dreij[3], Linda Spahiu[3], Arne Holmgren[4], Hiroshi Abe[5], Kenneth D Tew[2], Danyelle M Townsend[6], Michael J Kelner[7], Ralf Morgenstern[3*], Katarina Johansson[4]

[1] Science for Life Laboratory, Division of Translational Medicine and Chemical Biology, Department of Medical Biochemistry and Biophysics, Karolinska Institutet, Stockholm, Sweden

[2]Departments of Cell and Molecular Pharmacology and Experimental Therapeutics, Medical University of South Carolina, Charleston, South Carolina 29425, United States.

[3]Institute of Environmental Medicine, Division of Biochemical Toxicology, Karolinska Institutet, SE 17177 Stockholm, Sweden.

[4]Division of Biochemistry, Department of Medical Biochemistry and Biophysics, Karolinska Institutet, SE-171 77 Stockholm, Sweden.

[5]Department of Chemistry, Graduate School of Science, Nagoya University, Furo-cho, Chikusa-Ku, Nagoya, 464-8602, Japan

[6]Department of Pharmaceutical and Biomedical Sciences, Medical University of South Carolina, Charleston, South Carolina 29425, United States.

[7]Department of Pathology, University of California, San Diego, MC7721, La Jolla, CA92093-7721, United States.

[*]Correspondence to: Ralf Morgenstern, Institute of Environmental Medicine, Division of Biochemical Toxicology, Karolinska Institutet, SE 17177 Stockholm, Sweden. ralf.morgenstern@ki.se

ABSTRACT

We show for the first time that, in contrast to other glutathione transferases and peroxidases, deletion of microsomal glutathione transferase 1 (MGST1) in mice is embryonic lethal. To elucidate why, we used zebrafish development as a model system and found that knockdown of MGST1 produced impaired hematopoiesis. We show that MGST1 is expressed early during