

A DEFECTIVE REDOX SCAVENGER SYSTEM NEGATIVELY AFFECTS THE IN VITRO EMBRYO DEVELOPMENT OF COW OOCYTES

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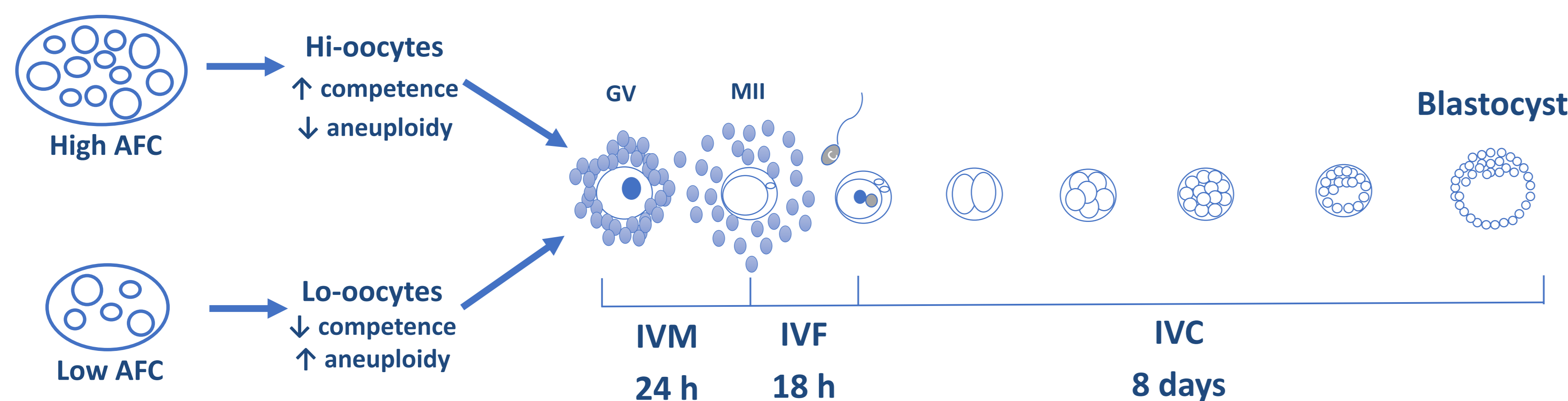
Background and Aim

Oxidative stress causes an imbalance of the redox system. In the oocyte oxidative stress can promote meiotic abnormalities and chromosome instability, increase apoptosis and impair the development of the pre-implantation embryo.



Investigate mitochondria and redox scavenger system in the bovine oocyte using a model of impaired developmental competence.

Experimental Model and Methods



Mitochondria were stained using the fluorescent probes:

- ✓ MitoTracker FM Green → total mitochondria
- ✓ MitoTracker Orange CMTMRos → active mitochondria

The GSH content was determined by spectrophotometry.

Gandolfi et al. 1997, Theriogenology; Tessaro et al. 2011, JAS; Luciano et al. 2013, BOR; Modina et al. 2014, RFD.

Results

Mitochondria distribution and activity

Total mitochondria

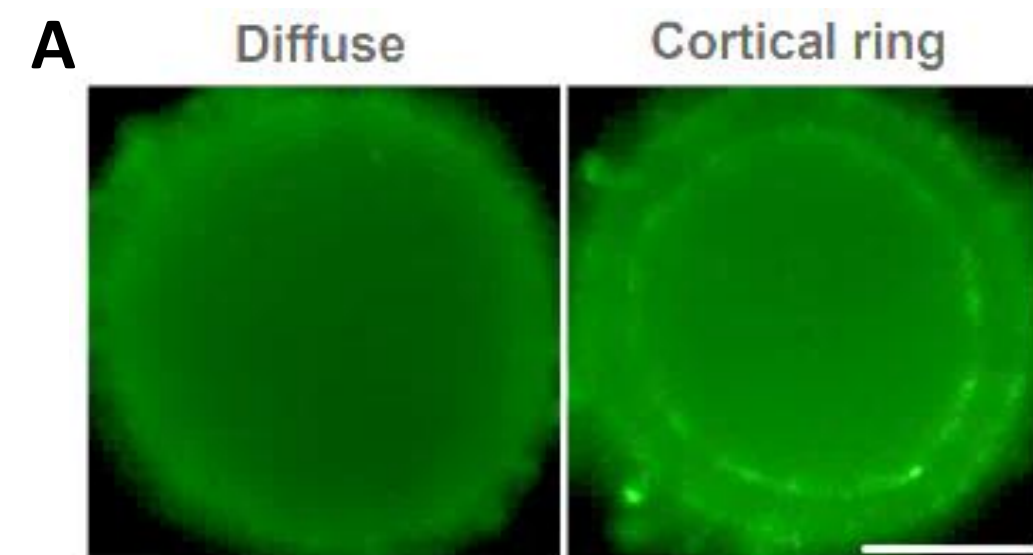


Fig A. Representative images of oocytes stained with MitoTracker FM Green.

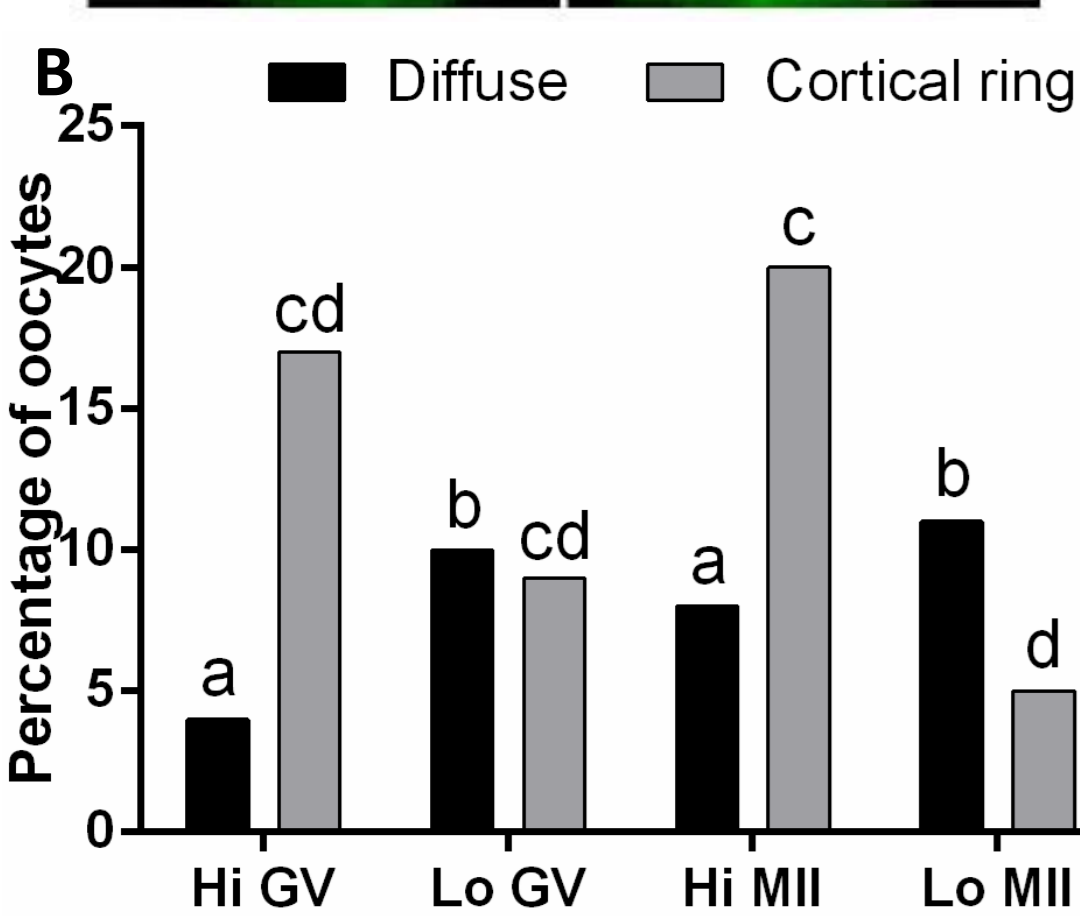
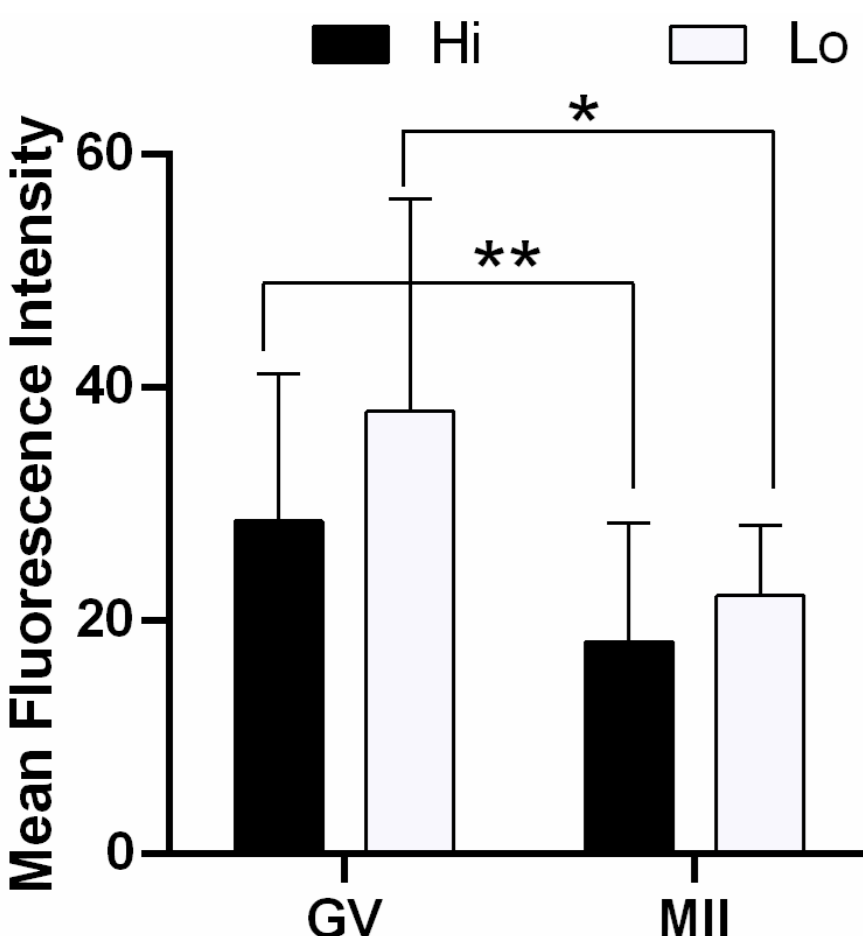


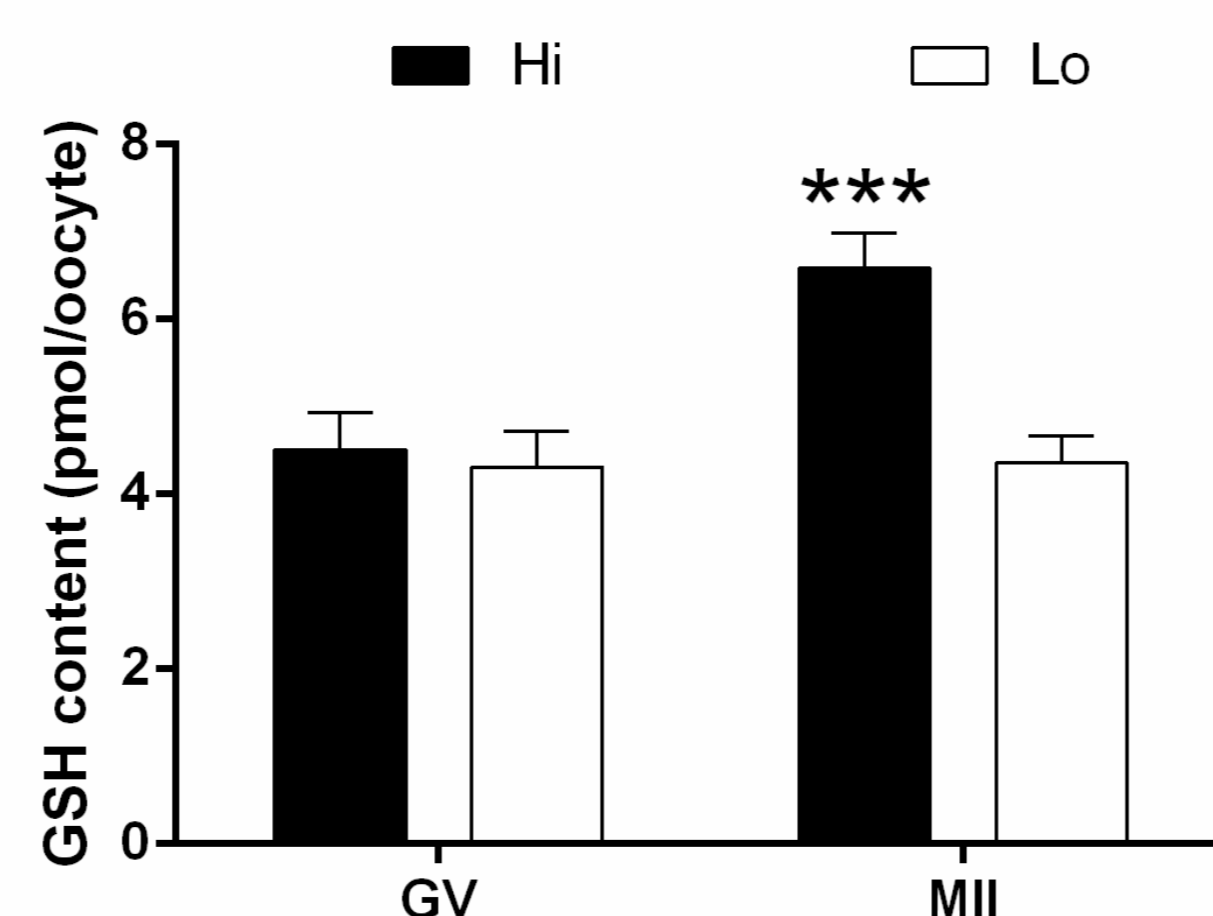
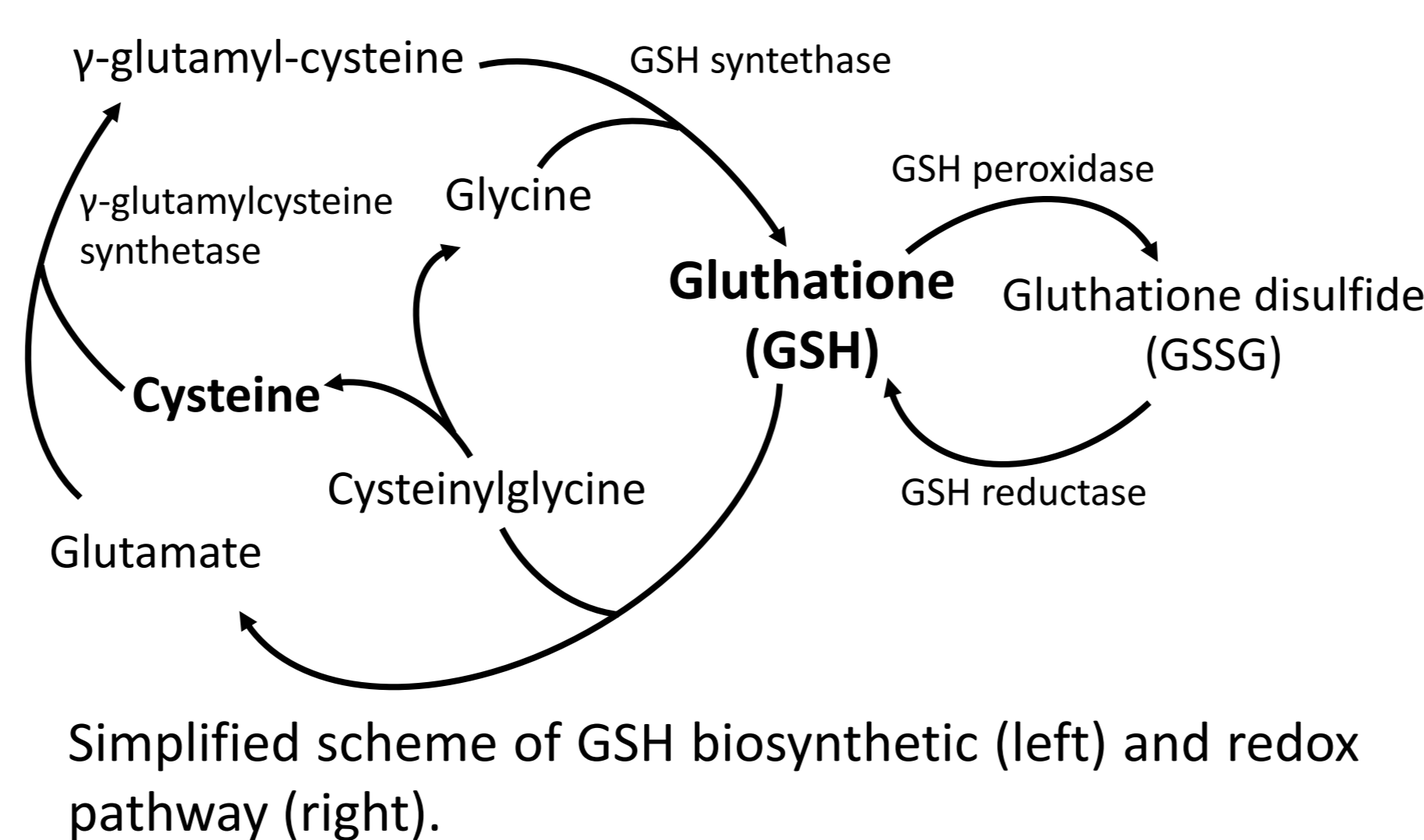
Fig B. Bar graphs represent the percentage of oocytes showing diffuse and cortical ring pattern. Different superscripts (a,b:diffuse; c,d: cortical ring) indicate P < 0.05 by Fisher exact test.

Active mitochondria



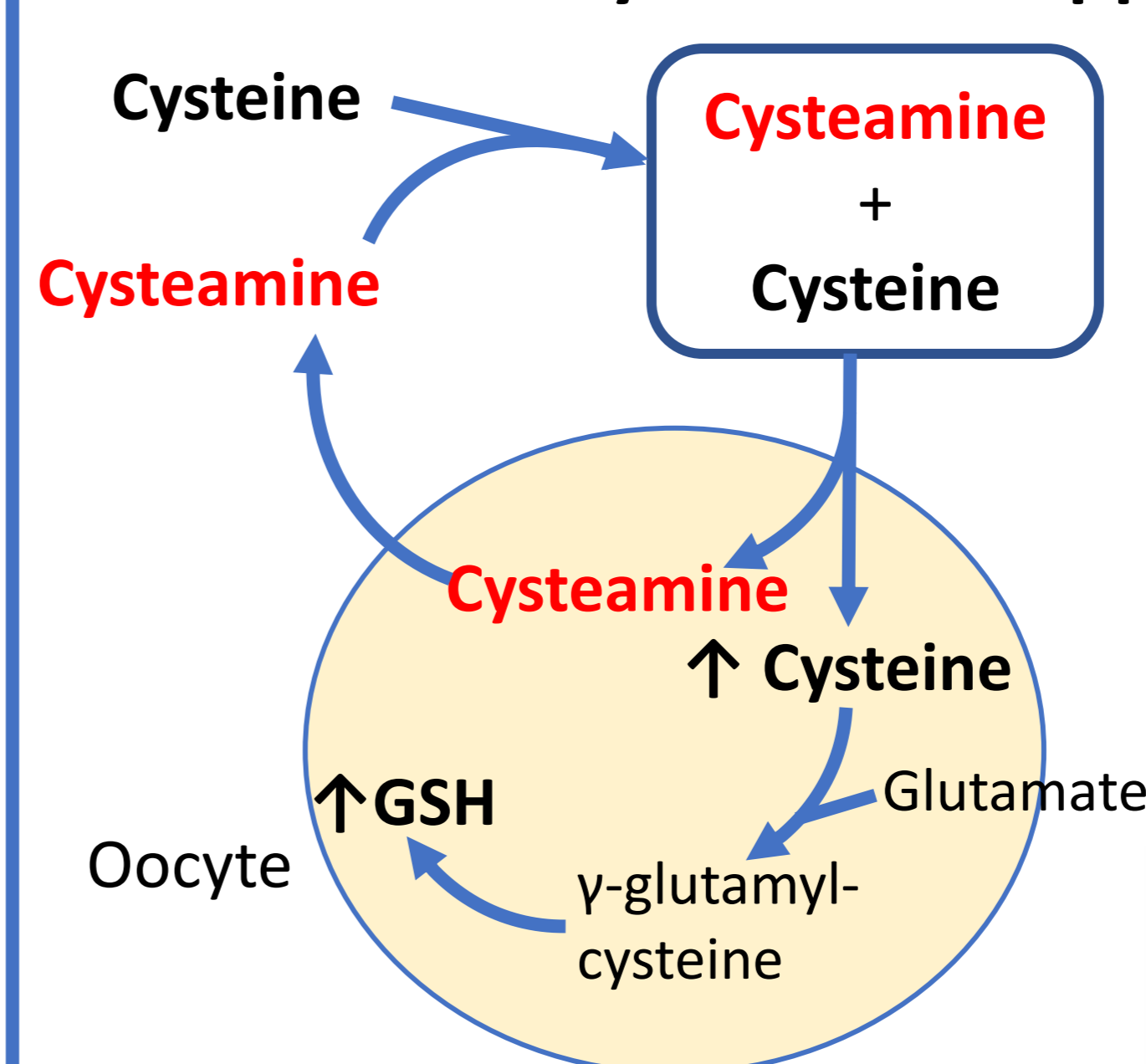
Bar graphs represent the mean relative fluorescence intensity ± sem of MitoTracker Orange CMTMRos. * P < 0.05, ** P < 0.01, Mann-Whitney test.

GSH content in the maturing oocyte



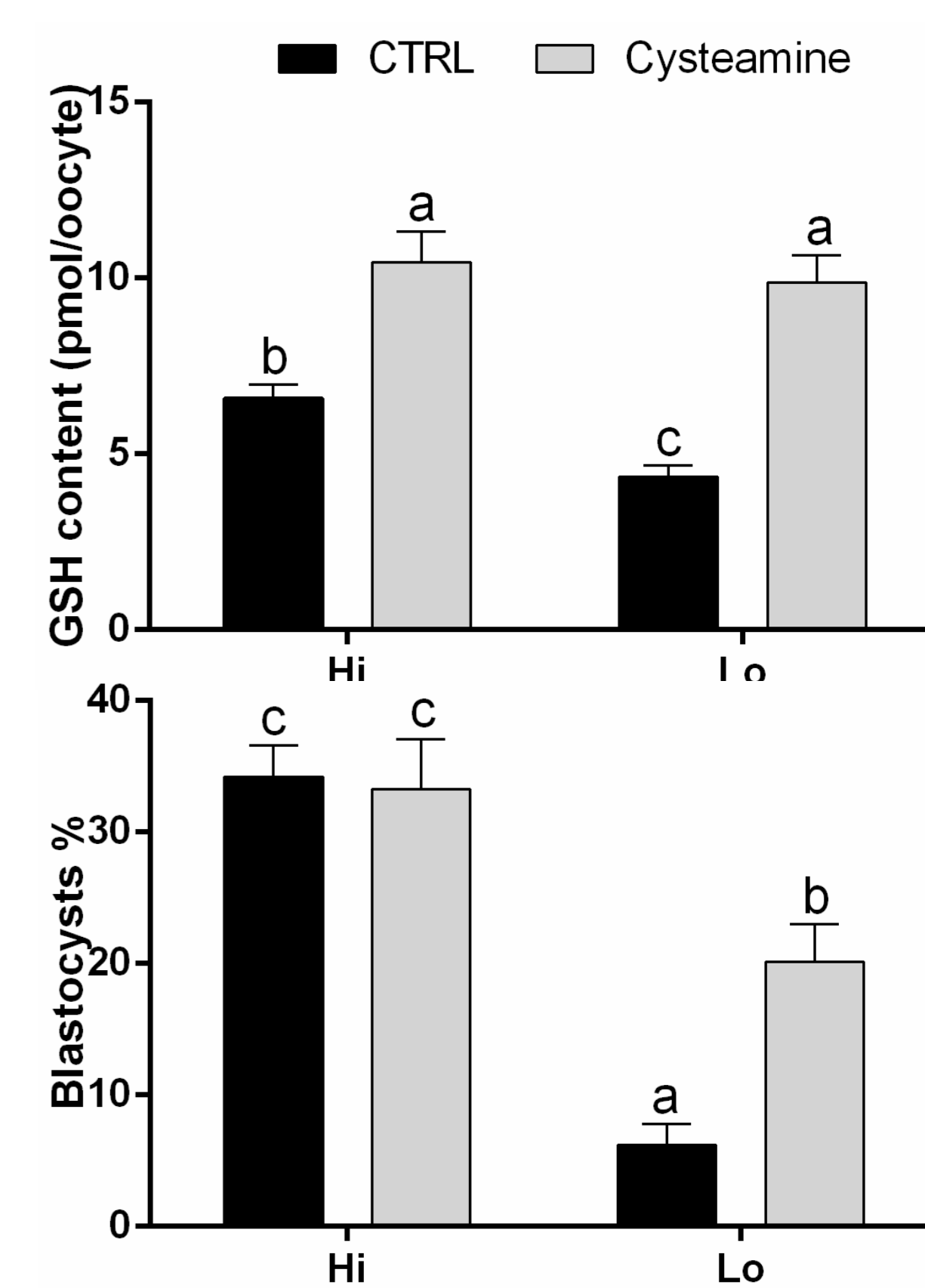
Bar graphs represent the mean ± sem of the GSH content. *** indicate P ≤ 0.0005, two-tailed T test (each column against every other column).

Effect of cysteamine supplementation during IVM

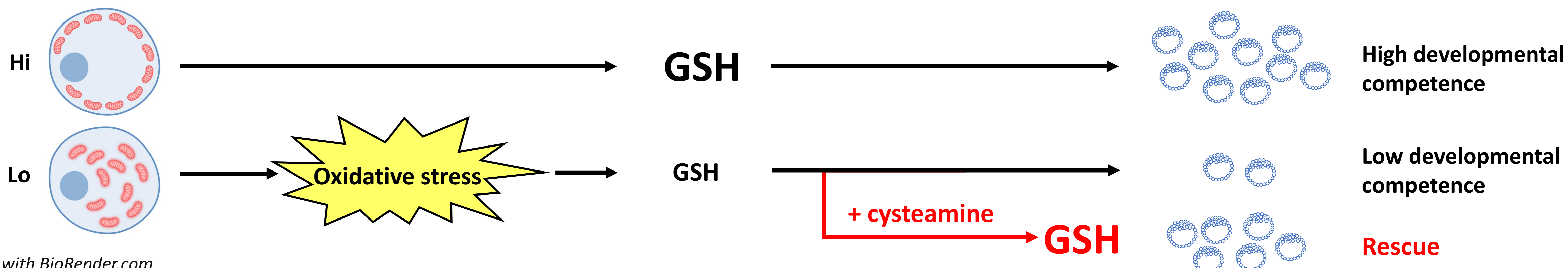


GSH content. Bar graphs represent the mean ± sem of the GSH content. Different superscripts indicate P ≤ 0.0005, two-tailed T test (each column against every other column).

Blastocyst rate. Bar graphs represent the mean ± sem of the percentage of blastocyst. Different superscripts indicate P ≤ 0.05, one-way ANOVA followed by Tukey's multiple comparison test.



Conclusions



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