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JOURNAL ARTICLE

Expression of clusterin/sulfated glycoprotein-2 under conditions of heat stress in rat Sertoli cells and a mouse Sertoli cell line

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Clusterin is the major protein produced by rat Sertoli cells and is deposited onto sperm membranes; however, its function is unknown. In order to gain insight into the regulation of clusterin in Sertoli cells, the objective of the present study was to develop a model where the expression of clusterin could be affected in Sertoli cells in vitro. Rat Sertoli cells and mouse Sertoli cells (MSC1) were cultured under heat stress conditions (41 degrees C) for up to 48 hours. The mRNA for clusterin in Sertoli cells was compared to that in human epitheliod cancer cells (A431) to determine if clusterin expression was regulated in a lestis-specific manner. The mRNA for heat shock protein 70 (HSP70) was also examined as it is a known stress-regulated gene. Expression of HSP70 mRNA was increased in all three cell types by 4 hours after the start of heat stress. Clusterin mRNA was increased over that of controls by 4 hours in heat-stressed A431 cells but did not significantly increase in MSC1 or Sertoli cells until 12 hours ($P < 0.05$). The induction of clusterin mRNA in MSC1 cells continued for at least 48 hours and required the sustained exposure of cells to the 41 degrees C temperature. The increase in the amount of clusterin mRNA was not due to an increase in transcript half-life, as determined by the addition of actinomycin D to the media of control vs. heat-stressed MSC1 cells. From the development of this in vitro model, we have seen that the timing of induction of clusterin by heat stress is Sertoli cell specific and is different than that of HSP70. This response in surviving cells during heat stress may be protective in that clusterin would bind to toxic compounds or solubilize cellular debris released by degenerating cells.

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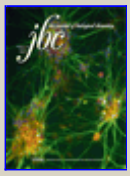

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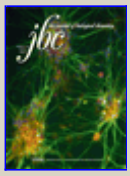

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