Amphibian oocytes respond to heat shock after the induction of meiotic maturation by hormones

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Exposure of Xenopus laevis oocytes to temperatures above 31° causes a drastic decrease in protein synthesis and a relative increase of a heat shock protein (HSP) of approximate molecular weight of 68,000. A significant increase in the synthesis of HSP is observed after only 5 minutes incubation of oocytes at 35°. Oocytes that have suffered heat shock immediately prior to treatment with human chorionic gonadotropin or progesterone can respond by undergoing meiotic maturation almost as efficiently as control cells. Also oocytes that are maturing and have gone through the breakdown of the nuclear membrane with concomitant chromosome condensation can synthesize HSP in response to heat shock treatment. These results support the idea that the synthesis of HSP in these cells is regulated at the post-transcriptional level.