**NADPH-OXIDASE-DERIVED REACTIVE OXYGEN SPECIES PARTICIPATE IN THE CONTROL OF CELL MOTILITY IN ZEBRAFISH EPIBOLY.**

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**Background**. NADPH oxidase (Nox) enzymes catalyze the formation of reactive oxygen species (ROS), superoxide and/or hydrogen peroxide. ROS are important signaling molecules involved in the regulation of major cellular behaviors such as cell migration. In zebrafish five *nox* genes have been found *nox1*, *nox2*, *nox4*, *nox5* and *duox*, from which *duox* has been previously reported to participate in hydrogen peroxide formation during wound response in 3 days post fertilization fishes. However, detailed studies on the participation of *nox* genes in early zebrafish development are still lacking. During zebrafish gastrulation a major cell motility developmental process occurs, which is known as epiboly. During epiboly cells move from the animal pole to the vegetal pole covering the yolk cell. Recently, we detected a distinctive ring of ROS formation in the region leading epiboly. Due to the particular capacity of Nox enzymes to form superoxide and hydrogen peroxide, we propose that Nox are responsible for ROS formation that participates in the control of epiboly. **Objectives.** Analyze the patterns of *nox* genes expression during early zebrafish development and characterize the effect on epiboly of Nox activity inhibition. **Methods and Results**. To characterize the expression of *nox* genes, RT-PCR reactions were carried out with RNA samples of zebrafish embryos obtained at different developmental stages. We found that *nox* genes present interesting temporal expression patterns suggesting their involvement in early development and in particular during gastrulation. We found that Nox activity inhibition decreased ROS formation, affected cell motility and delayed epiboly, effects that are fully rescued by hydrogen peroxide treatment. **Conclusions** These results indicate that the activities of several *nox* genes are required for the formation of ROS that participate in the modulation of cell motility during epiboly progression.

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