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Syncytial Nuclei Accumulate at the Villous Surface in IUGR while Proliferation is Unchanged

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Abstract:

Introduction: Placental syncytiotrophoblast is responsible for feto-maternal nutrient exchange during pregnancy. It is assumed that in IUGR, placental dysfunction is crucially bound to compromised stability and function of syncytiotrophoblast, the latter being related to altered proliferation of villous trophoblast. Cell cycle data obtained on conventional thin sections has produced inconsistent results. In the present study we investigated cell cycle markers found in the villous trophoblast using a novel 3D histological quantification method.

Methods and Findings: We analyzed 40 placentas from IUGR pregnancies and 42 placentas from clinically normal pregnancies by immunohistochemical detection of the cell cycle marker PCNA. Nuclei immuno-positive for PCNA were quantified using 3D microscopy, and the results were compared to corresponding results obtained on conventional thin histological sections. These data did not show any evidence of altered trophoblast proliferation in IUGR,