

In vitro culture in the presence of amorphous calcium carbonate improves mice embryos compaction and hatching rates

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Culturing embryos for 1 week has become a standard in assisted reproduction technology (ART). One condition that is well known to affect the in vitro culture (IVC) of embryos is the pH. It is known that low intracellular pH (pH_i) may activate lysosomal proteases such as the Cathepsin family. It was shown that high Cathepsin levels are inversely correlated to embryonic quality, most likely due to cleaving E-Cadherin, thus impairing the embryos ability to compact. Calcium carbonate dissolution is under mildly acidic conditions resulting with a mild increase of the pH to no more than 7.4. Amorphous calcium carbonate (ACC) is more soluble form of calcium carbonate. It is easily dissolved in aqueous solutions and remains clear. Results of 2500 mouse embryos siblings cultured with different commercial media supplemented with ACC showed improvement in the in-vitro growth and development competence, in particular: compaction, blastocyst and hatching rates.