

## Effects of Different Energy Substrates on Blastocyst Formation, Cell Number and ICM Proportion in Mouse Two Cell Embryos

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The aim of this study was to investigate effect of different energy substrates on embryonic development of mouse embryos. Two cell embryos, recovered from ICR female mice (4 weeks old) at 44~52hrs after hCG injection (mated just after hCG injection), were cultured for 72 hrs in the medium (MEM) supplemented with the three different energy substrates [glucose(G), pyruvate(P) and lactate(L)] and combinations (Control: 0 mM; group A: G 0.5; B: G 3.15; C: P 0.1; D: P 0.32; E: L 5.87; F: L 10.5; G: G0.5+P0.32+L10.5; H: G3.15+P0.1+L5.87; I: G0.5+P0.1+L5.87; J: G3.15+P0.32+L10.5). Blastocysts were stained differentially using PI and bisbenzimidazole. The 69.8% of the 2 cell embryos cultured in group F were developed the blastocysts. This was the highest (NS) than all other tested groups (44.2~62.8%). Blastocysts, cultured in the group E ( $60.4 \pm 26.9$ ) and G ( $58.1 \pm 26.3$ ), had significantly ( $p < 0.05$ : group E vs. control, B, C, D; G vs. control, A, B, C, D) higher mean cell number compared with the other ( $42.6 \pm 25.8 \sim 55.2 \pm 31.3$ ) and control ( $42.6 \pm 25.8$ ) was at the basal level. The proportion of ICM (% ICM of total cells) in blastocysts cultured in group B ( $26.0 \pm 9.5\%$ ), C ( $29.6 \pm 22.8\%$ ) and J ( $26.0 \pm 11.8\%$ ) were significantly higher ( $p < 0.05$ : control vs. group B, C, J; A vs. C, J; C vs. D, E, I) than those of other tested groups ( $15.0 \pm 10.6 \sim 23.8 \pm 12.9\%$ ) and control ( $15.0 \pm 10.6\%$ ) was at the basal level. These results showed that energy substrates supported the development of mouse 2 cell embryos, especially with greater embryo development in high dose of lactate added to media.

Key words) *Mouse 2 cell embryos, Blastocyst formation, Cell number, ICM proportion*