

B-myb, a novel biomarker for embryo viability and development

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Summary

The quality of the embryo transferred has a vital importance to the success of in vitro fertilization. Nowadays, various technologies were introduced for embryo viability prediction including morphokinetics, genomics, metabolomics, lipidomics and proteomics. The molecular profile was measured from the micro-droplets of day 3 and day 5 embryo culture likewise in control blank media by matrix-assisted laser desorption ionization tandem time-of-flight mass spectrometry. The molecular fingerprint of the blastocyst secretome can be a predictive technique to distinguish the viability of early stage human embryos. Based on our analyses the molecular differences of embryos with good and unsatisfactory implantation properties were significantly detectable after 3rd and 5th days. Additionally, B-myb transcription factor was identified as embryonic viability biomarker, which has a crucial role in early embryogenesis and successful implantation.

Keywords: blastocyst, MALDI, mass spectrometry, IVF, viability biomarker

B-myb, mint a magzat vitalitásának és fejlődésének új biomarkere

Összefoglalás

A beültetendő embrió minősége nagy mértékben befolyásolja a mesterséges megtermékenyítés sikerességét. Napjainkra már számos technika jött létre, amelyek segítségével megállapítható az embrió életképessége. Ezen módszerek közé sorolhatóak a morfokinetikai, genomikai, metabolomikai, lipidomikai és proteomikai vizsgálatok. Munkánk során 3 és 5 napos valamint embriót nem tartalmazó tápoldatok molekuláris vizsgálatát végeztük el mátrix-segített lézer deszorpciós ionizációs, repülési idő analizátoros tömegspektrometria segítségével. A korai stádiumú humán embriók életképességének megítélésére a tápfolyadékok molekuláris ujjlenyomatainak összehasonlító elemzését alkalmaztuk. A biokémiai és statisztikai analízis után megállapíthatóvá vált, hogy az életképes embriók és a beültetésre alkalmatlan blasztociszták a harmadik és ötödik napokon egyaránt elkülöníthetőek. Ráadásul, a tápfolyadékokból sikeresen azonosítottuk a B-myb transzkripciósfaktort, amely fontos szerepet játszik a korai embriogenezis során és nagymértékben hozzájárul az embrió normális fejlődéséhez.

Kulcsszavak: blasztocita, MALDI, tömegspektrometria, in vitro megtermékenyítés, biomarker

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