

1: [Biochem Biophys Res Commun](#). 2007 Mar 23;354(4):919-23. Epub 2007 Jan 24.

Induction of human umbilical cord blood-derived stem cells with embryonic stem cell phenotypes into insulin producing islet-like structure.

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Success in islet-transplantation-based therapies for type I diabetes, coupled with a worldwide shortage of transplant-ready islets, has motivated efforts to develop renewable sources of islet-replacement tissue. Embryonic stem cells (ESCs) have been successfully induced into insulin producing islet-like structure in several studies. However, the source of the ESCs has presented ethical and technical concerns. Here, we isolated a population of stem cells from human cord blood (UCB), which expressed embryo stage specific marker, SSEA-4, and the multi-potential stem cell marker, Oct4. Subsequently, we successfully induced them into insulin-producing islet-like structures, which co-express insulin and C-peptide. These findings might have a significant potential to advance human UCB derived stem-cell-based therapeutics for diabetes.

PMID: 17274951 [PubMed - indexed for MEDLINE]