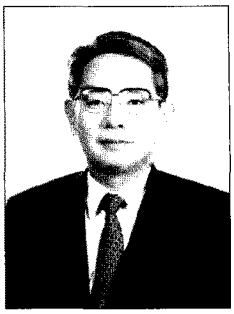
S 10

Shin-Yong Moon

Seoul National University



Present position

Professor of Obstetrics and Gynecology
Seoul National University College of Medicine
Seoul National University Hospital

Director of The Institute of Reproductive Medicine and Population,
Medical Research Center, Seoul National University

Director of The Korean Society of Developmental Biology

1998-present	Director of the Institute of Reproductive Medicine and Population Medical Research Center, Seoul National University
1996-present	Professor of Obstetrics and Gynecology, Seoul National University College of Medicine
2002-2006	Director of Stem cell Research Center, 21C Frontier R&D Program Korean Ministry of Science & Technology
1991-1996	Associate Professor of Obstetrics and Gynecology Seoul National University College of Medicine
1986-1991	Assistant Professor of Obstetrics and Gynecology Seoul National University College of Medicine
1987	Department of Obstetrics and Gynecology Eastern Virginia Medical School Jones Institute for Reproductive Medicine Norfolk, Va., U.S.A. (Clinical Fellow)
1983-1986	Instructor of Obstetrics and Gynecology Seoul National University College of Medicine
1985	Jones Institute for Reproductive Medicine Norfolk, Va., U.S.A.

	(Andrology Laboratory, Sperm and Embryo, Cryopreservation)
1984-present	Director of ART Program
	Seoul National University Hospital
1984	Jones Institute for Reproductive Medicine
	Norfolk, Va., U.S.A.
	(IVF program)
1982-1983	Department of Obstetrics and Gynecology
	Seoul National University Hospital
	(Reproductive Endocrinology & Cytogenetics)
1977-1987	Ph.D., Postgraduate Medical School, SNU
1975-1979	Ob & Gyn, Seoul National University Hospital, Resident
1974-1975	General, Medicin, Seoul National University Hospital, Internship
1975-1977	Mater, Postgraduate Medical School, SNU
1970-1974	General Medicine, Seoul National University College of Medicine (SNU)

Differentiation of Human Embryonic Stem Cells into Insulin-Producing Cell Clusters

Hyounmie Doh, Shin Yong Moon

Dept. of Ob&Gyn, Seoul National University College of Medicine,

Human embryonic cells (hESCs) could play an import part as a potential cell source for cell replacement therapy by the efficient differentiation into specific cell types *in vitro*. The generation of insulin- producing cell clusters (IPCCs) from hESCs has been extensively studied for the alternative treatment of diabetes, however, the differentiated cells have still various limitations in both quality and quantity. In this study, we tried a novel protocol improved with useful factors affecting the differentiation of IPCCs. First of all, a low glucose condition was introduced into the culture and differentiation of hESCs, focusing on that the long-term exposure of hESCs in high glucose concentrations, common as a nutrient in culture media, could hinder the differentiated IPCCs from producing insulin upon glucose stimulation. Activin A and betacellulin were also administered to promote the efficiency of IPCC differentiation. As a result, we confirmed that SNUhES3 adapted in 7.8 mM-glucose concentration maintained the stemness with normal karyotype, furthermore, showed a higher growth rate and the effective generation of cystic embryoid bodies. Fully differentiated IPCCs showed the expression of C-peptide, a by-product of insulin biosynthesis, and Pdx-1, an important transcription factor of islet differentiation, in appropriate locations with a high ratio. It was notable that the C-peptide content was considerably increased in IPCCs differentiated in a low glucose condition, and the insulin release in response to glucose stimulation was following the normal secreting machinery. In conclusion, these results suggest that our novel protocol would be efficient in inducing functional IPCCs.

Key Word: human embryonic cells, insulin- producing cell clusters, pancreatic β-cells, low glucose condition, diabetes mellitus, differentiation, cell replacement therapy