Forschungsprojekt mit humanen embryonalen Stammzellen /
Projet de recherche utilisant des cellules souches embryonnaires humaines
R-FP-S-1-0005-0000

Referenznummer / numéro de référence	R-FP-S-1-0005-0000
Projekttitel / titre du projet	*Use of aggregating rat brain cell cultures and development of an histotypic 3-dimensional culture system from human stem*
Projektstand / état du projet	beendet
Projektleiter_in / direction du projet	Dr. Florianne Tschudi-Monnet
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Projektbeginn / début du projet	Januar 2012
Voraussichtliche Dauer / durée probable	24 Monate
Ziele des Projekts / but du projet	Preparation of 3D cultures from human embryonic stem cells using a well established and characterized in vitro rodent brain cell model, the aggregating rat brain cell cultures, we have investigated the neurotoxic potential of drugs and of environmental toxicants. An early and sensitive marker of neurotoxicity appeared to be a neuroinflammatory response, characterized by the reactivity of glial cells (microglial cells and astrocytes). Interestingly, neuroinflammation is also a pathogenic mechanism in neurodegenerative diseases. In order to increase the predicatibility for human toxicity, we will prepare 3D cultures from human embryonic stem cells (hESC). By manipulating medium conditions and diverse trophic factors they should differentiate into neurons, astrocytes and oligodendrocytes. In addition human monocytes or human microglial cells obtained after specific differentiation of hESC will be added to the cultures, in order to obtain all types of brain cells. It is expected that these cultures will organize in an histotypic manner and will reproduce the complexity of the cell-to-cell interactions.

Verwendete hES Zelllinien / Lignées de cellules utilisées		
	H1 (WA01)	BAG-hES-IMP-0001
	CHES7	BAG-hES-GEW-0006
	CHES2	BAG-hES-GEW-0002
	CHES3	BAG-hES-GEW-0003
	CHES5	BAG-hES-GEW-0004

Projektergebnis / résultat du projet

From the human embryonic stem cells, induction of neural progenitors (NPCs) was performed. After expansion, the NPCs were detached and the cell suspension was transferred into low adhesion plates maintained in constant gyratory agitation. Under these conditions, 3D structures developped, grew in size and could be maintained for 3 months. NPCs underwent differentiation into neurons, astrocytes and oligodendrocytes. These 3D cultures were treated with several neurotoxicants (methyl mercury, trimethyl tin, paraquat, and iboprufen as negative control) and results were compared to those obtained in 3D cultures prepared from fetal rat brain cells..