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～Small-Scale, Footprint-Free Generation of Human iPSC from Cell Repository Specimens to Study Neuropsychiatric and Addiction Disorders～

Professor Moore is associate director of the largest academic cell and DNA repository in the USA. Her group -RUCDR (the Rutgers University Cell and DNA repository) - helps researchers who do genetics studies by providing the blood subjects, purifying, storing and preparing the DNA and iPSCs (induced pluripotent stem cells). They firstly check the cells to have no microbiological contamination including bacterial contamination as well as mycoplasma. They have developed and improve their required assays like QPCR for 96 species of mycoplasma and full dye SNP assay. On the other hand many of RUCDR's assays are nearly automatic using the robots to decrease contamination and have equal quality and condition for each sample.

She emphasized that RUCDR group is also useful for researchers to use the samples which were processed by one set of people to ensure that all samples treated equally, and comparison between each group is easier. One of the excellent aspects of using RUCDR bank is that they have huge store of patient information because of repository is home to more than 500000 Cryopreserved lymphocytes (CPLs) or lymphoblastoid cell lines (LCLs). Therefore, if you are interested in a genetic subject, you can search in their database and find your interest subjects.

In her laboratory at Rutgers University, she is doing research about the relationship between nicotine addiction and SNPs. To study this, she chose CHRNA5 gene, which is a nicotinic acid receptor expressed in human brain. CHRNA5 is ligand-gate ion voltage channel that controls a calcium influx into the synapse. So people who have this mutation, have decreased calcium permeability and increase sensitization and they likely to more suffer from

nicotine addiction. But contrary to her expectation, it has not 100% correlation. At the same time everyone who has nicotine addiction dose not necessarily have this mutation so it is not 100% correlated.

To understand how this point mutation affects people with nicotine addiction and to identify subjects that exist already, they generated iPSC from the new subjects that have this mutation, and then differentiated the iPSCs into the neuron (dopaminergic neuron in this subject). It is important to be sure their system is valid by ensuring that the gene variant is expressed in the dopaminergic neurons and the iPSCs have been made. They also want to ensure that the effects that receive on, is due to the mutation of the gene and it is why they planned to knock down this gene in merge to shows the specificity of the gene and finally RNA seq in the presence and absence on nicotine to look at these genes.

It was great experience for me to attend to the Professor Moore's seminar in English. It is good chance to know about other expert scientist's researches, especially those who work in famous university or company. I appreciated of NM-GCOE Network Medicine to give us these opportunities and I am waiting to attend to the more and more seminars in English, related to my fields of interest in the near future.

Mozhdeh Bagheri（細胞組織学分野・大学院生）

大学院生の感想

iPSC の generation differentiation 等、非常に興味深く拝聴させて頂きました。

RUCDR の説明が参考になりました。

皮膚生検せず、血液の検査でも、特に白血病患者に有用だという点が印象に残りました。