


FLASH from the LAB

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GREEN

and
LAM

Flash from the Stanford Lab!

As you recall, Green Eggs and LAM have been sponsoring LAM research at the Stanford Laboratory at the University of Toronto under the direction of Dr. William Stanford.

In LAM research, easy access to LAM cells in culture is needed so that these cells can be available for purposes such as testing the effect of drugs. Up to now, it has proven difficult to create pure LAM cells in culture.

Dr. Stanford and Dr. Kamal Garcha have been working hard to develop an improved cell culture for LAM cells. They are using a different approach than has been tried before. What they are attempting to do is to take some samples (blood, lung tissue) from one LAM patient, and try to convert these cells into stem cells. All cells in the body start off as stem cells (cells which have the potential to become other cells), then they change into specialty cells such as lung tissue, blood cells, brain cells etc. By reprogramming the LAM cells, Dr. Stanford will 'turn back' the cells into their stem cell of origin. Then the scientists will direct the cells to change from the premature stem cell into fully specialized (termed differentiated) cells. Dr. Stanford will attempt to duplicate his results with samples from other LAM patients. It will be interesting to find out what type of cells he will end up with as this will help to explain the origin of LAM cells and how they grow in the body.

Dr. Stanford reports:

We are working hard to engineer an improved cell culture model for LAM by converting LAM patient cells to stem cells. We are pleased to report that we have apparently succeeded in the first step of this process. Using LAM cells provided to us by Dr. Lisa Henske, we have reprogrammed them into LAM-induced pluripotent stem cells (LAM-iPSCs), which will facilitate our understanding of the development and progression of this disease. Our intent is to systematically direct the differentiation of LAM-iPSCs to numerous cell types, which we believe will provide insight into the origin of the cells that contribute to the LAM tumors. In particular, neural crest cells* will be derived as previous studies have shown that LAM cells harbor many markers indicative of neural crest cells.

Currently, we are validating the newly derived LAM-iPSCs for their stem cell properties by confirming the presence of cell surface markers consistent with pluripotent embryonic stem cells. Once this process is complete, we will begin to perform in vitro/vivo differentiation assays to validate the ability of the LAM-iPSCs to develop into a representative number of cell types of the body.

Twenty-four putative LAM-iPSC lines have been expanded and frozen, thus generating a LAM-iPSC bio bank. Validated LAM-iPSC lines will be made openly available for distribution to all LAM researchers. Our hope is that by free dissemination of these cells we will encourage and foster further research of LAM. We are also talking with other LAM physicians to procure more patient cells to expand our LAM-iPSC bio bank to ensure that we are modeling LAM rather than one patient's disease.



- *neural crest cells are a type of stem cell that goes on to become cartilage, bone and connective tissue.
- Pluripotential: Cells that can become any cell in the adult body.
- Surface markers: Generally are proteins that are specific to a type of cell and are on the surface membrane of cells. By identifying these proteins the scientists can show they have the right type of cell.