Lab Visit Report : Surat Raktadan Kendra and Research Centre

STEM CELL BANKS

By: M.S.c Medical Biotechnology, SRKI College ,Sarvajanik University .

1. INTRODUCTION

M.Sc. Medical BT students, Visited SURAT Raktadan Kendra and Research Centre Stem Cell Bank on 23 march 2022 at 3:30 pm ,where Dr. Kanchan Kumar sir has guided us for the lab Visit. The purpose of visiting the labwas to educate How Stem cell were preserve , Processing of stem cell, working on stem cell line(Hematopoietic stem cell), RT PCRworking. It was very well-planned laboratory visit.

First of all on visiting the lab, we were welcomed and instructed to sit in conference room. There Dr. Kanchan Kumar sir give us introduction of what are stem cells, properties of Stem cell , Hematopoietic stem cell working, current status of stem cell, etc. Then after we visited actual stem cell processing and preserving unit. when we went for processing unit all were instructed to sanitize their Hands outside, After entering into main area we were instructed to wear either slippers or disposable foot gloves.

2. Infrastructure Of Stem Cell Bank

1. Separation of stem cell by fully automated machine SEPAX 2.

2. Bact Alter 911 to detect Bacteria & fungi.

3. ELISA testing for testing infectious agent in Blood.

4. Flow cytometer for isolation and detection of actual present of stem cell or not.

5. Preservation room

1. *Unit to collect the sample already processed.*
2. *Temperature lower down machine. Ultra freezer temperature regulates -80 degree C .*
3. 100 Bio Geneic system for cryopreservation of cell.
4. Small cryopreserver for small amount of sample.
5. Liquid Nitrogen cylinder Tank for transporting the sample.
6. casette for storing sample.

6.NAT ROOM

1. Preparation of master mixture in Biosafety cabinet in presence of uv light .
2. NAT room for separation of DNA/RNA(MAGNETIC SORTER).
3. NAT room which has RT- PCR machine.

3. PROCEDURE

3.1. The collection of stem cell sample from hospitals is the first step. prior to that counseling of parents were taken. The blood sample be collected in tube withanticoagulant so that clotting would not occur. But if the clotting occur, the sample should not process further.The sample should kept at lower temperature , reached to center within 72 hrs for processing. The amount of processing of sample should not be less than 40-45 ml. If the amount is less than 40 ml, then processing should not be done because yield will be negligible. The separation of Stem cells from various other blood components is done by centrifuge machine which is sepax 2 and it is pass though chamber to other rooms.

3.2. **Bact Alter 911** used to detect the Bacteria and fungi in sample.It can detect low amount of contaminant also.

3.3. **ELISA testing :** After separation of stem cell test like Enzyme linked immunosorbent assay are performed to avoid any infectious causing agent in sample.

3.4. **Flow cytometer:** - The flow cytometer is used for the identification of stem cell on the basis of surface marker(CD 34). This flow cytometer is also used to separate stem cell from all other cells with the help of fluorescent Cell sorting.

3.5. **Preservation Room:** After all above testing, stem cell samples was taken to inner preservation room in aseptic manner by specical transport system (two sided door). In the preservation room, the Sample was collected from the unit and place into machine where temperature low down at arate of 1°C per min so that sample would not form ice crystal into it. In the preservation room, cryotanks for storage of liquid N_2, ultra- Freeze (-80°c) for the purpose ofcryopreservation. The storage of stem cell in cryotank was (-190 tO -192 degree c) done in vapor phase of liquid Nitogen in order to avoidcontamination. The small size cryotank was used for small amount of sample and transportation purpose.

3.6. ***RTPCR Machine*** *: It was present for the purpose of identification of infection due to viruses or bacteria. There was a separate room which has Biosafety cabinet with UV source for making master mixture of PCR. There was a NAT room for separation of DNA/RNA of the sample cells.*

3.7. The wall of lab infrastructure was resistant to bacterial and fungal activity, internal structure also has a HEPA filters present in it.

4. CONCLUSION

From these whole visits, we able to know the importance of stem cell, its implementation into therapeutical aspects to cure health disease, originality work done in stem cell line, scope of stem cell line ,and carrier prospect.

Our learning from the visit: - Enhancing knowledge of stem cell subject, developing scientific researching abilities, increasing understanding of complexity and ambiguity of empirical work.

5. REFRENCES

Images: Surat Raktdan Kendra

6. Acknowledgement

This report come to an end with lots of thanks to Dr. Kanchan Kumar sir, Miss Salomi Madam, Miss varsha Madam, Dr. Darshan Marjadi Sir and Dr. Datasha Kantharia Madam for taking us to the visit, we got opportunity of of learning more than we expected.

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