

Human Fetal Fibroblasts

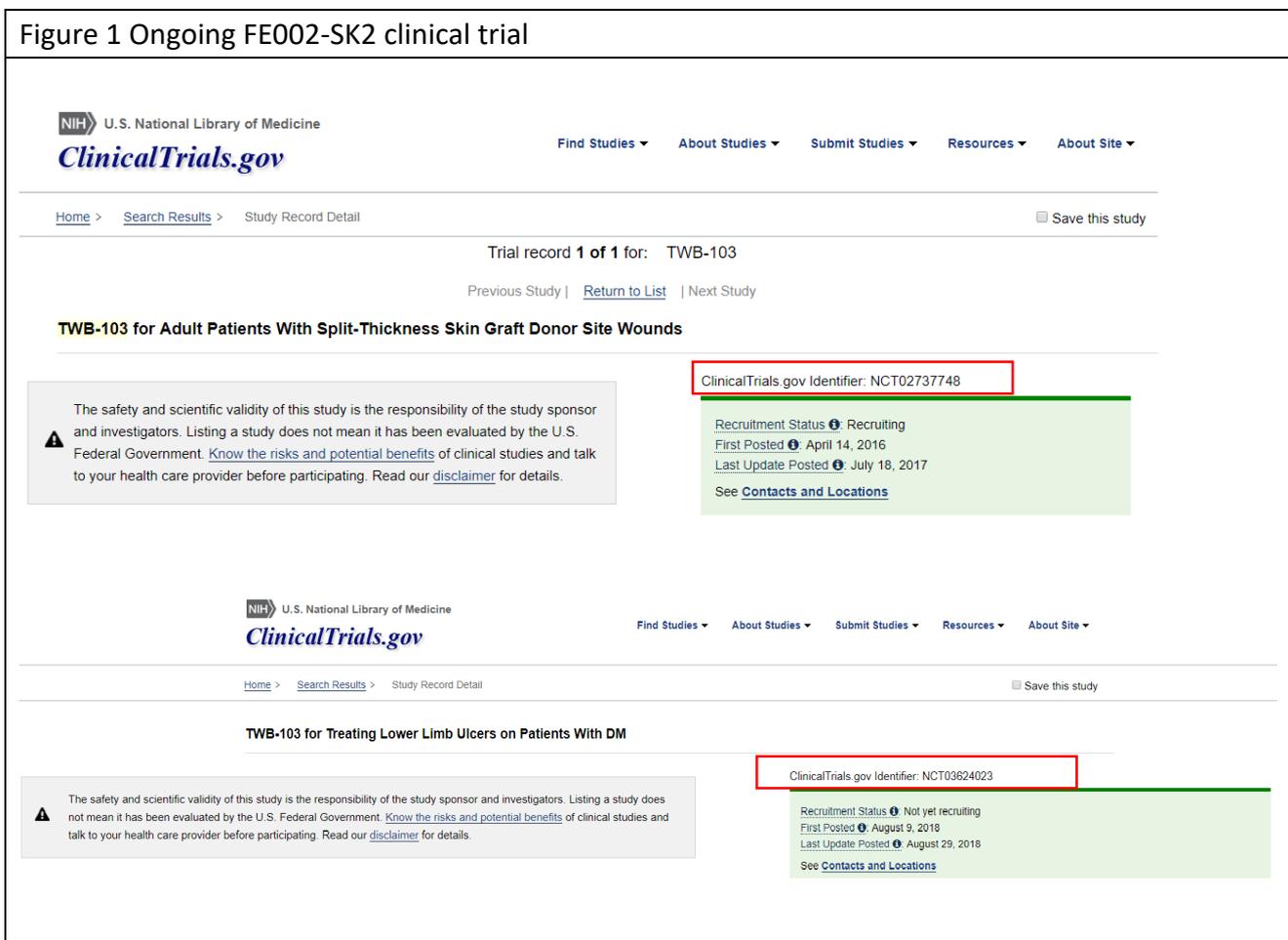
“High Quality Human Feeder Cells
For Pluripotent Stem Cells”

1 Human Fetal Dermal Fibroblast (FE002-SK2)

A human fetal dermal fibroblast cell line, FE002-SK2, was originally isolated, cultured and certificated in Lausanne University Hospital (Centre Hospitalier Universitaire Vaudois, CHUV, Switzerland) from the biopsied dermis of human fetus. The primary dermal fibroblasts were culture-expanded, cryopreserved and tested to establish a master cell bank (MCB) and a working cell bank (WCB) of FE002-SK2 cells by BioReliance. The qualification of cell banks all have met the regulation requirements.

There are two ongoing FE002-SK2 clinical trial (with the ClinicalTrials.gov Identifier: NCT02737748 and NCT03624023) (Figure 1)

Figure 1 Ongoing FE002-SK2 clinical trial



The figure displays two screenshots of the ClinicalTrials.gov website. The top screenshot shows the trial record for 'TWB-103 for Adult Patients With Split-Thickness Skin Graft Donor Site Wounds'. The ClinicalTrials.gov Identifier is NCT02737748, and the recruitment status is 'Recruiting'. The bottom screenshot shows the trial record for 'TWB-103 for Treating Lower Limb Ulcers on Patients With DM'. The ClinicalTrials.gov Identifier is NCT03624023, and the recruitment status is 'Not yet recruiting'.

2 Why Human Feeder Cells?

- The ability of feeder-free culture system to maintain genetic stability of iPS/hESC (human embryonic stem cells) remains controversial.
- hESC/iPS cell lines derived from MEF (mouse feeder cell) have animal pathogen contamination issue if for future human therapy.
- No GMP-compliant human feeder cells product are available in stem cell market.

3 Our Solutions

- Mitomycin-C treated human fetal fibroblasts (HFF) support human pluripotent cell without introducing a second species to the culture conditions.
- Different grades of feeder cells (Research grade/Clinical grade)
- High quality control and lot-to-lot consistency (negative for bacteria/fungal/mycoplasma/human pathogen contamination)
- FBS-Free/Xeno-Free

The product cell bank of CBI-HFF is generated from a series of well-controlled cell production procedure. All the cells are from one single original donor, and there is no need for a second donor. The original one-time donation is already enough to provide hundreds of thousands of standard vials of feeder to support the iPS/hESC market use for over decades.

Market potential for feeder use indeed is not limited to stem cell culturing. Studies have shown other types of cells such as oral mucosal epithelium, limbal epithelium, Iris pigmented and retinal pigmented epithelial cells, and tracheal epithelial cells which also require the support from feeder cells. With the growing cell therapy market in the world, we expect the market demand for a high quality feeder product like CBI-HFF should increase gradually and steadily.

4 Our goal and strategy in feeder cell market

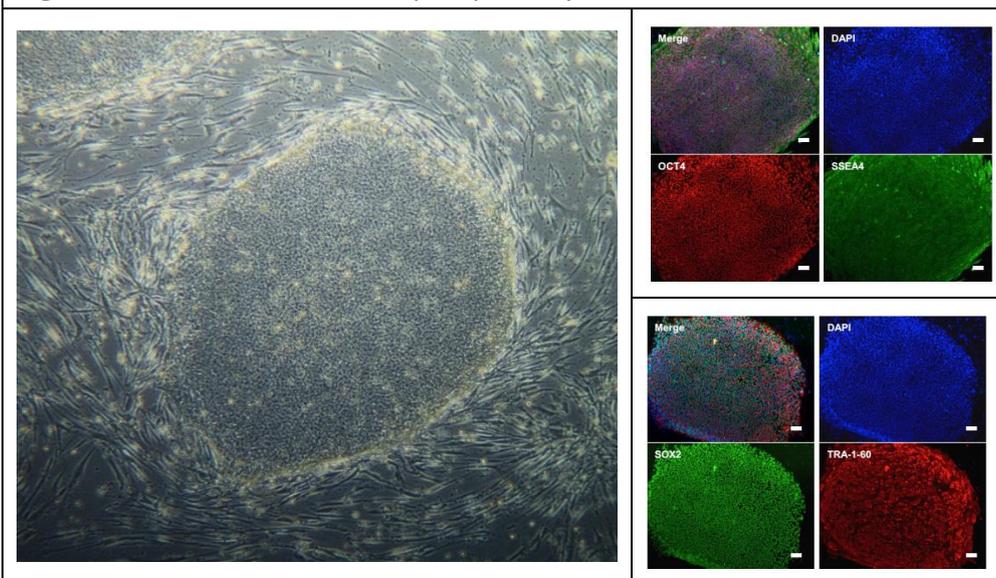
- Create long term cooperation with our customers in different product developmental stages



5 CBI-HFF

Each lot of product has been performed comprehensive test including cell viability, sterility, human pathogen, and mycoplasma detection. Also, these cells have been qualified to maintain and support the pluripotency of hESC/iPS cells (Figure 2).

Figure 2 CBI-HFF maintain the pluripotency of stem cells



We have two different specs of CBI-HFF for our customer need as following:



Cat No.	Product	Contents
CBI010220	Human fetal fibroblast mitomycin-C treated, Xeno-Free/FBS-free	1.5 – 2 M cells/vial
CBI010240	Human fetal fibroblast mitomycin-C treated, Xeno-Free/FBS-free	3.5 – 4 M cells/vial

6 Q&A

6.1 What are feeder cells?

Feeders or feeder cells have routinely been used to support the culture and maintenance of embryonic stem cells (ESCs) or induced pluripotent stem cells (iPSCs) in an undifferentiated state without losing their pluripotency .

6.2 What's the advantage of CBI-HFF for culturing ES cells?

CBI-HFF serve as a substrate for the stem cells to grow on. They secrete a number of critical and essential growth factors which are important for the maintenance of pluripotency. In addition, CBI-HFF are also a very reliable, readily available, and reproducible source of feeder cells.

6.3 At what density should I plate my feeder cells?

The density depends on the ESC or iPSC lines you are culturing. The recommended density was previously used by the source from which you received the cell line; or determined through your personal experience. The density which has been successfully used to support undifferentiated pluripotent stem cells ranges from 20,000 to 50,000 cells/cm² .

6.4 Should I use gelatin when plating CBI-HFF?

CBI-HFF adhere well to tissue culture plastic without coating the plastic with matrix proteins. In addition, gelatin introduces potential variability and toxicity into the cell culture system.

6.5 What types of tests have CBI-HFF being performed on to confirm lot-to-lot consistency?

- a. Cell Viability
- b. Human Pathogen Screen
- c. Sterility – Bacterial and Fungal
- d. Mycoplasma testing
- e. Cell Identity – STR (short tandem repeat) analysis
- f. Functionality – Support pluripotent stem cell culture through multiple passages based on the morphology, growth, and immunostaining of multiple pluripotent markers.

6.6 Both clinical grade and research grade CBI-HFF are provided for research use?

Yes, both grades of CBI-HFF are provided for research use only. The difference between grades is as following: “Research grade” (or “laboratory grade”, more precisely) is produced in clean room and quality-controlled according to CBI internal SOP for cell products. “Clinical grade” is produced in GTP compliant facility and quality-assured according to the USP and guidelines of the FDA. Potency and purity are guaranteed, as well as other mechanisms to protect the product quality.

6.7 The ethical issue for the use of human fetal fibroblast

The fibroblast cell derived from human fetus was strictly regulated and the very same cell line of CBI-HFF has already been clear for ongoing clinical use in Taiwan-FDA, Japan-PMDA, and USA-FDA.

7 References

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