**Colorectal Cancer Dissociated Tumor Cells**

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**Safety**

Primary tumor cells should be contained in a Class II biological safety cabinet and handled using Biosafety Level 2 (BSL-2) work practices and facilities (1).

**Cell Culture Media and Antibiotics**

* Recommended cell culture media for colorectal DTCs (2):
  + DMEM-F12 medium with 10% fetal bovine serum and 10% L-glutamine
* Antibiotics
  + Penicillin (500 IU/ml)
  + Streptomycin (500 μg/ml)
  + Gentamicin (100 μg/ml)
  + Amphotericin B/Fungizone (12.5 μg/ml)
  + Metronidazole (5 µg/mL)
* Supplements
  + 8 ng/ml bFGF
* Supplements recommended for unthawing samples
  + DNase I (1 mg/ml), resuspended in PBS without calcium or magnesium and filter-sterilized.

**Unthawing Instructions**

* On the day of the thaw, pre-warm 19 mls of recommended cell culture media in a 37°C incubator.
* Divide the media into two 15-ml conical tubes (1 tube with 9 mls of media; 1 tube with 10 mls of media).
* Quickly thaw the DTC sample in a 37-40°C water bath until 2mm crystals remain. Move sample through the water to speed thawing.
* Slowly add the 1-ml DTC sample to 9 mls of pre-warmed media. Gently mix by inversion (do not vortex).
* Centrifuge the conical tube at 300 x g for 5-10 minutes (no brake). Carefully remove the supernatant.
* After the initial wash to remove DMSO from the sample, gently resuspend the pellet in the remaining 10 mls of pre-warmed cell culture media.
* If the cells clump together, perform the following:
  + Add DNase I (1 mg/ml) to the cell culture media.
  + Incubate at 37°C for 5-10 minutes to facilitate digestion of released DNA.
  + Centrifuge the conical tube at 300 x g for 5 - 10 minutes (no brake).
  + Carefully remove the supernatant containing DNase I.
  + Gently suspend the pellet in 10 mls of pre-warmed cell culture media. Go to the next step.
* Allow cells to rest for at least 1 hour in the media at 37°C before checking the viability and plating.
* Check the viability and cell number of the sample (3).
* Plate the cells according to assay requirements.

**Culturing Primary Cells**

* For sphere formation assays, a serum-free media may also be used (such as StemPro hESC SFM, ThermoFisher Scientific). Cells can be plated on ultra-low attachment tissue culture flasks (4).
* The media recipe listed above can be used as a base media for tissue culture. Antibiotics should be added to the tissue culture media and any wash buffers to prevent microbial growth.
* Please see the literature for further supplementation recommendations required by the cell types targeted for *in vitro* expansion.

**References**

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3. Chan, L. L.; D. J. Laverty; T. Smith; P. Nejad; H. Hei; R. Gandhi; D. Kuksin; J. Qiu. 2013. Accurate measurement of peripheral blood mononuclear cell concentration using image cytometry to eliminate RBC-induced counting error. *J Immunol Methods.* 388:25-32.
4. Kondo, J.; H. Endo; H. Okuyama; O. Ishikawa; H. Iishi; M. Tsujii; M. Ohue; M. Inoue. 2011. Retaining cell-cell contact enables preparation and culture of spheroids composed of pure primary cancer cells from colorectal cancer. *Proc Natl Acad Sci U S A.* 108:6235-6240.

**Thawing and Culturing Procedures**