BCRJ Code:	0104
Cell Line:	HL-60
Species:	Homo sapiens
Vulgar Name:	Human
Tissue:	Peripheral Blood
Cell Type:	Promyeloblast
Morphology:	Myeloblast
Disease:	Acute Promyelocytic Leukemia
Growth Properties:	Suspension
Sex:	Female
Age/Ethinicity:	36 Year / Caucasian
Applications:	This cell line is a suitable transfection host.
DNA Profile:	Amelogenin: X D5S818: 12 D13S317: 8,11 D7S820: 11,12 D16S539: 11 vWA: 16 THO1: 7,8 TPOX: 8,11 CSF1PO: 13,14
Tumor Formation::	Yes, in nude mice (subcutaneous myeloid tumors) Yes, in semi-solid media
Products:	tumor necrosis factor (TNF), also known as tumor necrosis factor alpha (TNF-alpha, TNF alpha), after stimulation with phorbol myristic acid
Biosafety:	1

Addtional Info:	HL-60 cells spontaneously differentiate and differentiation can be stimulated by butyrate, hypoxanthine, phorbol myristic acid (PMA, TPA), dimethylsulfoxide (DMSO, 1% to 1.5%), actinomycin D, and retinoic acid. The cells exhibit phagocytic activity and responsiveness to chemotactic stimuli. The line is positive for myc oncogene expression.
Culture Medium:	Iscove's Modified Dulbecco's Medium (IMDM) contains 4 mM L-glutamine, 4500 mg/L glucose and 20% of fetal bovine serum.
Subculturing:	Cultures can be maintained by addition of fresh medium. Alternatively, cultures can be established by centrifugation with subsequent resuspension at 1 x 10e5 viable cells/mL. Maintain cultures at a cell concentration between 1 x 10e5 and 1 x 10e6 cells/mL. NOTE: Do not allow the cell concentration to exceed 1 x 10e6 cells/mL. Population Doubling Time about: 24-30 hours
Subculturing Medium Renewal:	Every 2 to 3 days
Culture Conditions:	Atmosphere: air, 95%; carbon dioxide (CO2), 5% Temperature: 37°C
Cryopreservation:	95% FBS + 5% DMSO (Dimethyl sulfoxide)

Thawing Frozen Cells:

SAFETY PRECAUTION: It is strongly recommended to always wear protective gloves, clothing, and a full-face mask when handling frozen vials. Some vials may leak when submerged in liquid nitrogen, allowing nitrogen to slowly enter the vial. Upon thawing, the conversion of liquid nitrogen back to its gas phase may cause the vial to explode or eject its cap with significant force, creating flying debris.

1. Thaw the vial by gently agitating it in a 37°C water bath. To minimize contamination, keep the O-ring and cap out of the water. Thawing should be rapid (approximately 2 minutes).
2. Remove the vial from the water bath as soon as its contents are thawed and decontaminate it by dipping in or spraying with 70% ethanol. From this point, all operations must be performed under strict aseptic conditions.
3. For cells sensitive to DMSO, it is recommended to remove the cryoprotective agent immediately. Transfer the vial contents to a centrifuge tube containing 9.0 mL of complete culture medium and centrifuge at approximately 125 × g for 5 to 7 minutes.
4. Discard the supernatant and resuspend the cell pellet in the recommended complete medium (see specific batch information for the appropriate dilution ratio).
5. Incubate the culture under appropriate atmospheric and temperature conditions (see "Culture Conditions" for this cell line).

NOTE: It is important to avoid excessive alkalinity of the medium during cell recovery. To minimize this risk, it is recommended to place the culture vessel containing the growth medium in the incubator for at least 15 minutes before adding the vial contents. This allows the medium to stabilize at its normal pH (7.0 to 7.6).

References:

Gallagher R, et al. Characterization of the continuous, differentiating myeloid cell line (HL-60) from a patient with acute promyelocytic leukemia. Blood 54: 713-733, 1979. PubMed: 288488 Collins SJ, et al. Terminal differentiation of human promyelocytic leukemia cells induced by dimethyl sulfoxide and other polar compounds. Proc. Natl. Acad. Sci. USA 75: 2458-2462, 1978. PubMed: 276884 Collins SJ, et al. Continuous growth and differentiation of human myeloid leukaemic cells in suspension culture. Nature 270: 347-349, 1977. PubMed: 271272 Aggarwal BB, et al. Human tumor necrosis factor. Production, purification, and characterization. J. Biol. Chem. 260: 2345-2354, 1985. PubMed: 3871770 Nahm MH, et al. Identification of cross-reactive antibodies with low opsonophogocytic activity for Streptoccus pneumoniae. J. Infect. Dis. 176: 698-703, 1997. PubMed: 9291318 Berninghausen O, Leippe M. Necrosis versus apoptosis as the mechanism of target cell death induced by Entamoeba histolytica. Infect. Immun. 65: 3615-3621, 1997. PubMed: 9284127 Aparicio CL, et al. Correction for label leakage in fluorimetric assays of cell adhesion. BioTechniques 23: 1056-1060, 1997. PubMed: 9421636 Mansat V, et al. The protein kinase C activators phorbol esters and phosphatidylserine inhibit neutral aphingomyelinase activation, ceramide generation, and apoptosis triggered by daunorubicin. Cancer Res. 57: 5300-5304, 1997. PubMed: 9393753 Cuthbert JA, Lipsky PE. Regulation of proliferation and Ras localization in transformed cells by products of mevalonate metabolism. Cancer Res. 57: 3498-3504, 1997. PubMed: 9270019 Michael JM, et al. Resistance to radiation-induced apoptosis in Burkitt's lumphoma cells is associated with defective ceramide signaling. Cancer Res. 57: 3600-3605, 1997. PubMed: 9270034 Clark RA, et al. Tenascin supports lymphocyte rolling. J. Cell Biol. 137: 755-765, 1997. PubMed: 9151679 Tiffany HL, et al. Enhanced expression of the eosinophil-derived neurotoin ribonuclease (RNS2) gene requires interaction between the promoter and intron. J. Biol. Chem. 271: 12387-12393, 1996. PubMed: 8647842 Chan YJ, et al. Synergistic interactions between overlapping binding sites for the serum response factor and ELK-1 proteins mediate both basal enhancement and phorbol ester responsiveness of primate cytomegalovirus. J. Virol. 70: 8590-8605, 1996. PubMed: 8970984 Mao M, et al. RIG-E, a human homolog of the murine Ly-6 family, is induced by retinoic acid during the differentiation of acute promyelocytic leukemia cell. Proc. Natl. Acad. Sci. USA 93: 5910-5914, 1996. PubMed: 8650192 Lepley RA, et al. Tyrosine kinase activity modulates catalysis and translocation of cellular 5-lipoxygenase. J. Biol. Chem. 271: 6179-6184, 1996. PubMed: 8626407 Chen H, et al. Octamer binding factors and their coactivator can activate the murine PU.1 (spi-1) promoter. J. Biol. Chem. 271: 15743-15752, 1996. PubMed: 8663022 U.S. Pharmacopeia USP Monographs: Technetium 99mTc Fanolesomab Injection. Rockville, MD: USP32-NF27, 2005

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