NEXALAB
BIOLOGICS

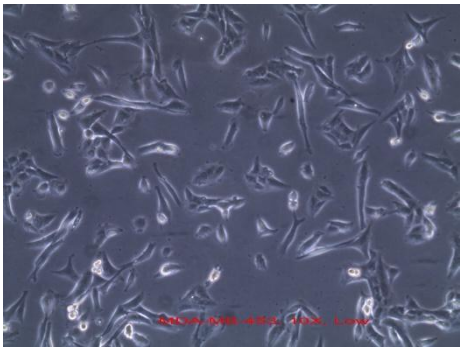
Cell Line Catalog

Index

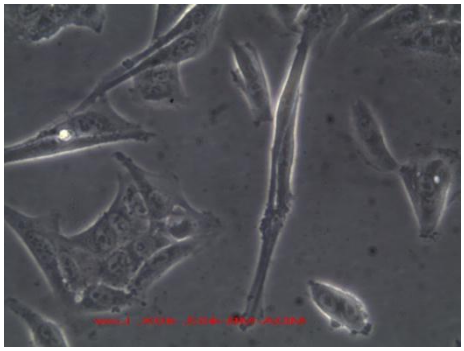
Human

Breast

MDA-MB-453



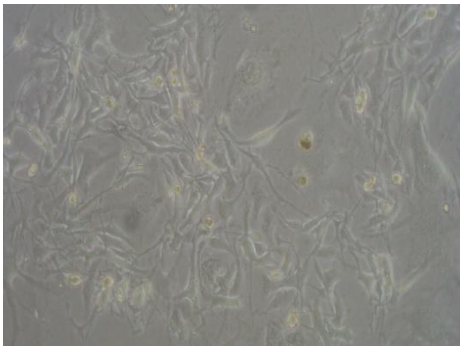
MDA-MB-453, 10X, Low.



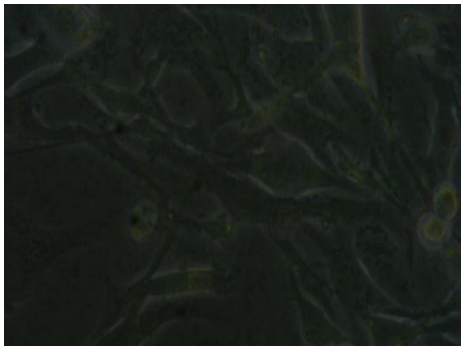
MDA-MB-453, 40X, Low.

Full Name:	MD Anderson Metastatic Breast-453 (MDA-MB-453) cell line.
Organism:	*Homo sapiens* (Human).
Tissue of Origin:	Breast (mammary gland).
Cell Type:	Epithelial cells (breast carcinoma).
Disease:	Metastatic breast adenocarcinoma.
Morphology:	Epithelial-like, round to polygonal.
Applications:	Studies of HER2-positive breast cancer, androgen receptor (AR) signaling in breast cancer progression and therapy resistance, targeted therapy research, and 3D cell culture models.
Growth Properties:	Adherent, typically forming colonies.
Derivation:	Derived from the pleural effusion of a 48-year-old female patient with metastatic breast adenocarcinoma. This cell line is classified as HER2 positive, androgen receptor (AR) positive, while lacking estrogen (ER) and progesterone (PR) receptor expression.
Culture Medium:	Leibovitz's L-15 medium, supplemented with 10% Fetal Bovine Serum.
Comments:	MDA-MB-453 cells are commonly used as a model for HER2-positive/AR-positive breast cancer. They should be cultured in a CO_2-free environment when using L-15 medium, as it is buffered for atmospheric conditions. Regular monitoring is recommended to maintain optimal cell morphology and growth characteristics.

MDA-MB-231



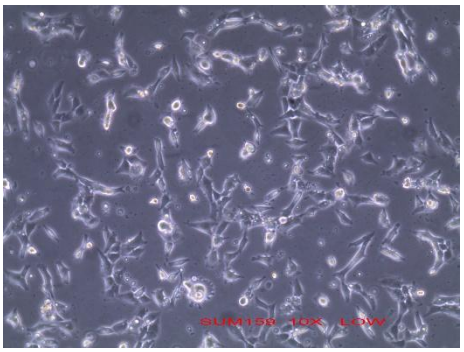
MDA-MB-231, 10X, High.



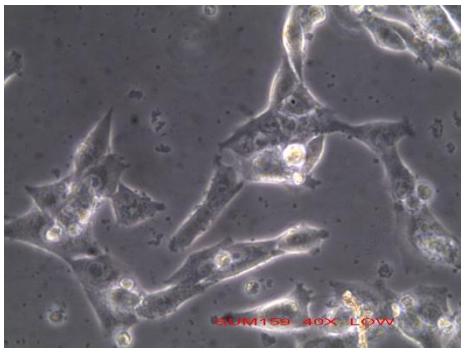
MDA-MB-231, 40X, High.

Full Name:	MDA-MB-231 cell line.
Organism:	*Homo sapiens* (Human).
Tissue of Origin:	Breast (mammary gland).
Cell Type:	Mesenchymal-like.
Disease:	Breast adenocarcinoma.
Morphology:	Spindle-shaped, fibroblast-like cells with mesenchymal characteristics.
Applications:	Studies of triple-negative breast cancer (TNBC), metastasis and invasion, epithelial–mesenchymal transition (EMT), drug resistance, and cancer cell migration.
Growth Properties:	Adherent cells forming a monolayer.
Derivation:	Derived from the pleural effusion of a 51-year-old female patient with metastatic breast adenocarcinoma.
Culture Medium:	High-glucose Dulbecco's Modified Eagle Medium, supplemented with 10% Fetal Bovine Serum and 1% penicillin/streptomycin.
Comments:	MDA-231 cells are highly invasive and represent a triple-negative breast cancer model, they also exhibit strong migratory behavior.

SUM159PT



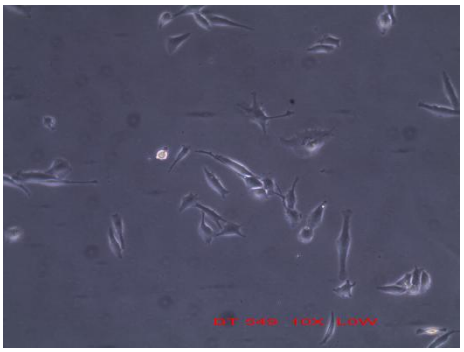
SUM159, 10X, Low.



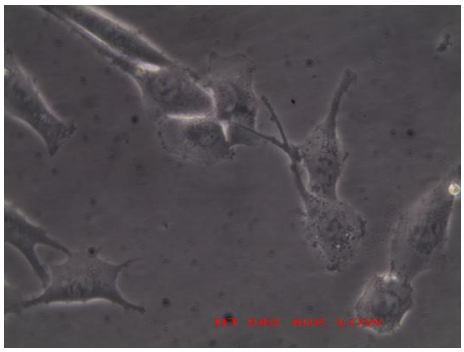
SUM159, 40X, Low.

Full Name:	SUM159PT cell line.
Organism:	*Homo sapiens* (Human).
Tissue of Origin:	Breast (mammary gland).
Cell Type:	Mesenchymal-like breast carcinoma cells.
Disease:	Breast pleomorphic (anaplastic) carcinoma.
Morphology:	Mesenchymal-like, spindle-shaped cells with basal-like characteristics.
Applications:	Studies of triple-negative breast cancer (TNBC) biology and therapeutic response, signaling pathway inhibition, cancer stem cell research, and epithelial-mesenchymal transition (EMT).
Growth Properties:	Adherent cells forming a monolayer.
Derivation:	Derived from a 71-year-old female with anaplastic (pleomorphic) breast carcinoma. This cell line is classified as a triple-negative breast cancer (TNBC), lacking estrogen receptor (ER), progesterone receptor (PR), and HER2 expression.
Culture Medium:	DMEM/F-12, supplemented with 10% Fetal Bovine Serum, 1% L-glutamine, 1% penicillin/streptomycin.
Comments:	This cell line is highly proliferative and invasive; therefore, cultures should be monitored closely to prevent overgrowth.

BT-549



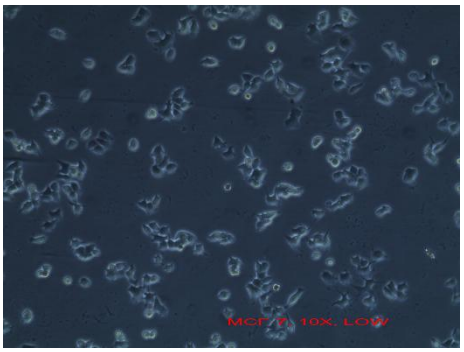
BT-549, 10X, Low.



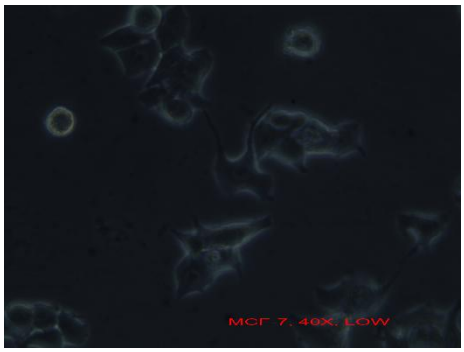
BT-549, 40X, Low.

Full Name:	BT-549 cell line.
Organism:	*Homo sapiens* (Human).
Tissue of Origin:	Breast (mammary gland).
Cell Type:	Epithelial breast carcinoma cells.
Disease:	Papillary, invasive ductal carcinoma.
Morphology:	Epithelial-like, with multinucleated giant cells.
Applications:	Studies of triple-negative breast cancer (TNBC) biology and therapeutic response, 3D cell culture applications, identification of potential therapeutic targets, and investigation of signaling pathways.
Growth Properties:	Adherent cells forming a monolayer.
Derivation:	Derived from the mammary gland tissue of a 72-year-old female with ductal carcinoma, with metastasis to regional lymph nodes. This cell line is classified as a triple-negative breast cancer (TNBC), lacking estrogen receptor (ER), progesterone receptor (PR), and HER2 expression.
Culture Medium:	RPMI-16400 (Roswell Park Memorial Institute), supplemented with 10% Fetal Bovine Serum, 0.023 U/mL insulin, 1% penicillin/streptomycin.
Comments:	BT-549 cells exhibit relatively slow growth compared to other breast cancer cell lines. Regular monitoring is recommended to maintain cells.

MCF-7



MCF-7, 10X, Low.

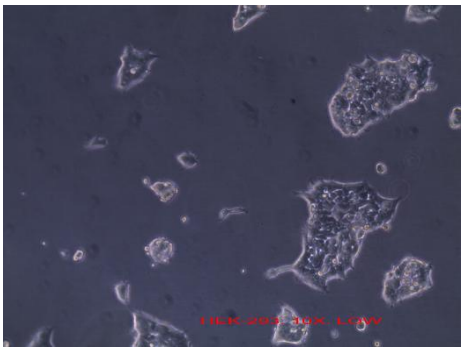


MCF-7, 40X, Low.

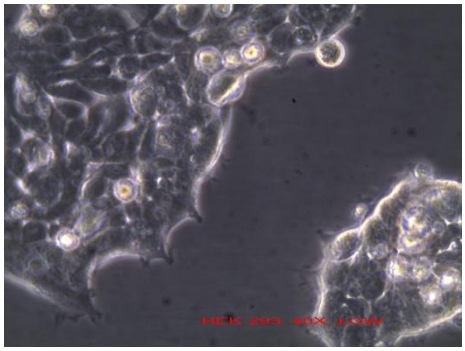
Full Name:	Michigan Cancer Foundation (MCF-7) cell line.
Organism:	*Homo sapiens* (Human).
Tissue of Origin:	Breast (mammary gland).
Cell Type:	Epithelial.
Disease:	Breast adenocarcinoma.
Morphology:	Epithelial-like.
Applications:	Studies of hormone-responsive breast cancer, estrogen receptor (ER) signaling, drug screening, apoptosis, and cancer progression.
Growth Properties:	Adherent cells forming a monolayer.
Derivation:	Derived from the pleural effusion of a 69-year-old female patient with metastatic breast adenocarcinoma. This cell line is a widely used Luminal A breast cancer model that is estrogen receptor (ER) positive, progesterone receptor (PR) positive, and HER2 negative.
Culture Medium:	RPMI-16400 (Roswell Park Memorial Institute), supplemented with 10% Fetal Bovine Serum, 1% L-glutamine, 1% penicillin/streptomycin.
Comments:	MCF-7 cells can form domes in culture due to active ion transport and are less invasive compared to triple-negative breast cancer cell lines.

Kidney

HEK-293



HEK-293, 10X, Low.



HEK-293, 40X, Low.

Full Name:	Human Embryonic Kidney (HEK-293) cell line.
Organism:	*Homo sapiens* (Human).
Tissue of Origin:	Kidney (embryo).
Cell Type:	Epithelial-like, with debated lineage origin.
Disease:	Normal, transformed, immortalized.
Morphology:	Epithelial-like cells that form loosely attached clusters, may appear slightly granular.
Applications:	Transfection host, recombinant protein production, viral vector production, and functional genomics studies.
Growth Properties:	Semi-adherent cells forming a monolayer.
Derivation:	Generated by transfection of normal healthy embryonic kidney cells with adenovirus 5 DNA by Alex Van der Eb. The exact cellular origin remains under discussion, with evidence suggesting epithelial, neuronal, or other lineages.
Culture Medium:	High-glucose Dulbecco's Modified Eagle Medium, supplemented with 10% Fetal Bovine Serum and 1% penicillin/streptomycin.
Comments:	HEK-293 cells are easy to culture and highly transfectable, making them widely used in molecular biology. While they can sometimes be detached by gentle pipetting or tapping, enzymatic dissociation (e.g., trypsin) is generally recommended for consistent passaging.

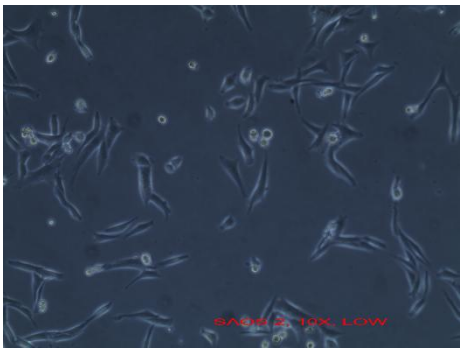
Variant: HEK-293T

Derivation:	HEK-293T is a derivative of HEK-293 cells that stably expresses the SV40 large T-antigen, enabling replication of plasmids containing the SV40 origin of

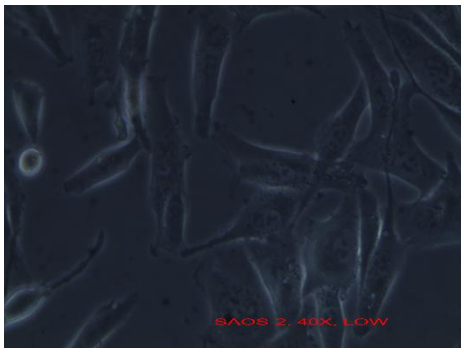
	replication and resulting in enhanced protein expression. This variant is commonly used for high-efficiency transfection and viral production.

Bone

Saos-2



SAOS-2, 10X, Low.

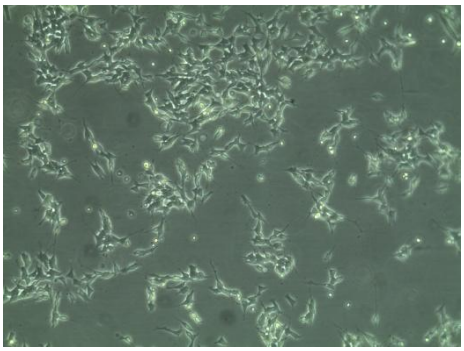


SAOS-2, 40X, Low.

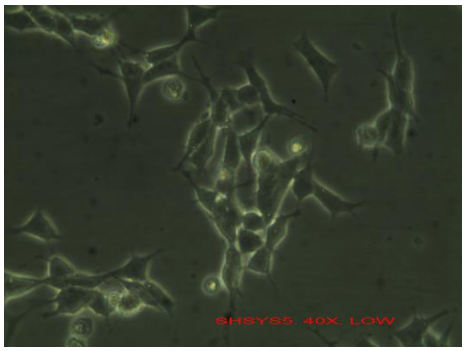
Full Name:	Sarcoma osteogenic (Saos-2) cell line.
Organism:	*Homo sapiens* (Human).
Tissue of Origin:	*Bone.*
Cell Type:	*Osteosarcoma cells.*
Disease:	*Osteosarcoma.*
Morphology:	*Epithelial-like, polygonal cells capable of forming mineralized matrix under appropriate conditions.*
Applications:	*Cancer research and transfection studies, investigation of osteoblast differentiation and bone formation, cell adhesion and proliferation studies, and 3D cell culture.*
Growth Properties:	*Adherent cells forming a monolayer.*
Derivation:	*Derived from the bone of an 11-year-old female osteosarcoma patient, isolated by J. Fogh and G. Trempe. The patient was treated with RTG, methotrexate, adriamycin, vincristine, cytoxan, and aramycin-C.*
Culture Medium:	High-glucose Dulbecco's Modified Eagle Medium, supplemented with 10% Fetal Bovine Serum, 1% L-glutamine, 1% penicillin/streptomycin.
Comments:	*Saos-2 cells are p53-null and exhibit strong osteoblastic differentiation potential, including the ability to produce alkaline phosphatase and mineralized extracellular matrix.*

Nervous system

SH-SY5Y



SH-SY5Y, 10X, Low.

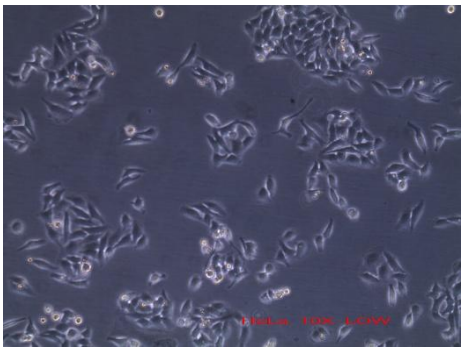


SH-SY5Y, 40X, Low.

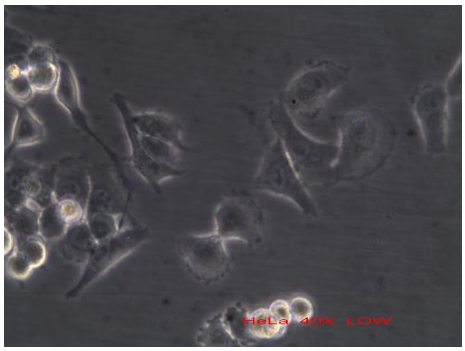
Full Name:	SH-SY5Y cell line.
Organism:	*Homo sapiens* (Human).
Tissue of Origin:	Bone marrow (metastatic neuroblastoma).
Cell Type:	Neuroblastoma.
Disease:	Neuroblastoma.
Morphology:	Epithelial-like. Polygonal cells that can differentiate into neuron-like cells.
Applications:	Studies of neurodegenerative diseases (e.g., Parkinson's and Alzheimer's), neuronal differentiation, dopaminergic signaling and marker expression, neurotoxicity, and pharmacological testing.
Growth Properties:	Adherent, may grow in suspension under certain conditions.
Derivation:	Derived as a subclone of the parental SK-N-SH cell line; originally from a biopsy of a metastatic bone tumor of a 4-year-old female patient.
Culture Medium:	High-glucose Dulbecco's Modified Eagle Medium, supplemented with 10% Fetal Bovine Serum, 1% L-glutamine, 1% penicillin/streptomycin.
Comments:	It is recommended to use low to mid passage cells, as prolonged passaging may alter growth characteristics and differentiation potential.

Cervix

HeLa



HeLa, 10X, Low.

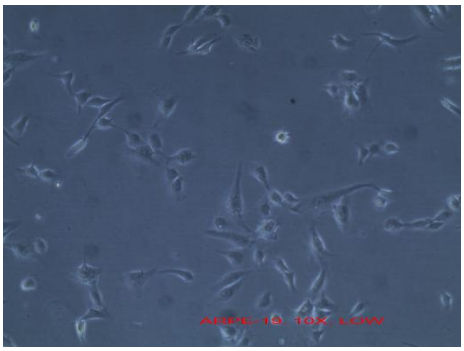


HeLa, 40X, Low.

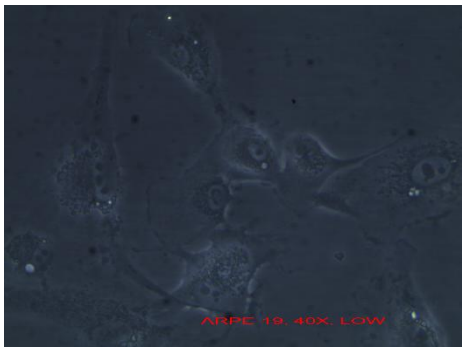
Full Name:	HeLa cell line.
Organism:	*Homo sapiens* (Human).
Tissue of Origin:	Uterus (cervix).
Cell Type:	Epithelial carcinoma cells.
Disease:	Adenocarcinoma (cervical cancer).
Morphology:	Epithelial-like.
Applications:	Cancer research, studies of Human papillomavirus (HPV) pathogenesis, vaccine development, gene expression and regulation studies, virology, and toxicology testing.
Growth Properties:	Adherent cells forming a monolayer.
Derivation:	Derived from the cervix tissue of a 31-year-old female patient, Henrietta Lacks, with cervical adenocarcinoma. HeLa cells represent the first immortalized human cell line.
Culture Medium:	Low-glucose Dulbecco's Modified Eagle Medium (DMEM) supplemented with 10% Fetal Bovine Serum (FBS), 1% L-glutamine, 1% penicillin–streptomycin.
Comments:	HeLa cells are highly proliferative and robust, making them easy to culture. However, they are a common source of cross-contamination for other cell lines, therefore strict aseptic techniques are essential.

Eye

ARPE-19



ARPE-19, 10X, Low.

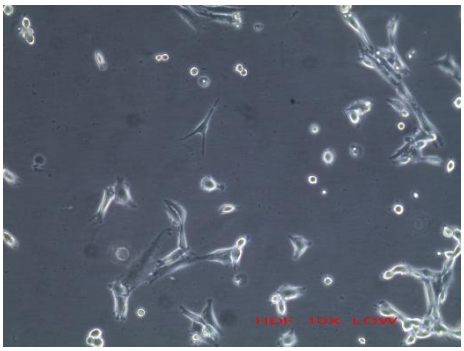


ARPE-19, 40X, Low.

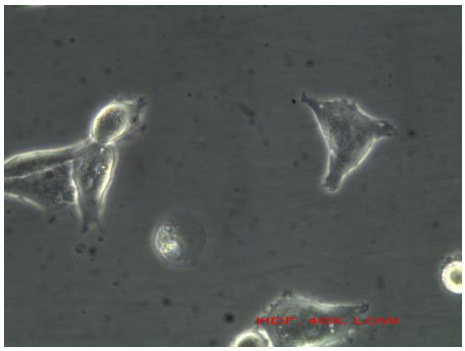
Full Name:	Adult Retinal Pigment Epithelial-19 (ARPE-19) cell line.
Organism:	*Homo sapiens* (Human).
Tissue of Origin:	Eye (retina).
Cell Type:	Retinal pigmented epithelium.
Disease:	Normal, immortalized, non-tumorigenic.
Morphology:	Epithelial-like cells, capable of forming polarized monolayers with pigmentation under appropriate conditions.
Applications:	Studies of retinal biology and function, retinal pigment epithelium (RPE) physiology, pigmentation processes, ocular diseases (e.g., age-related macular degeneration), drug screening, and ophthalmic research.
Growth Properties:	Adherent cells forming a monolayer.
Derivation:	Derived from the normal eye of a 19-year-old male donor.
Culture Medium:	DMEM/F-12, supplemented with 10% Fetal Bovine Serum, 1% L-glutamine, 1% penicillin/streptomycin.
Comments:	ARPE-19 cells can develop polarization and functional characteristics of RPE under optimized culture conditions, however full differentiation may require extended culture time. Careful maintenance is recommended to preserve physiological relevance.

Skin

HDF



HDF, 10X, Low.

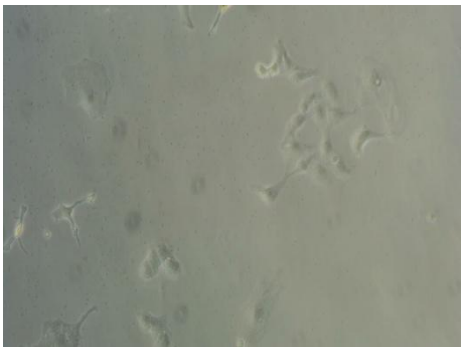


HDF, 40X, Low.

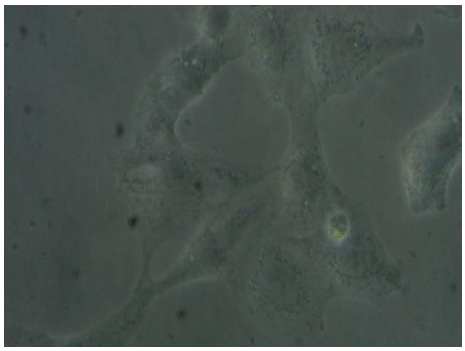
Full Name:	Human Dermal Fibroblast (HDF) cell line.
Organism:	*Homo sapiens* (Human).
Tissue of Origin:	Dermis (skin).
Cell Type:	Fibroblast.
Disease:	Normal (primary cells).
Morphology:	Spindle-shaped, fibroblast-like cells forming elongated parallel arrays.
Applications:	Studies of skin physiology and aging, extracellular matrix (ECM) production and remodeling, wound healing, tissue engineering, and dermatological research.
Growth Properties:	Adherent cells forming a monolayer.
Derivation:	Primary cells isolated from the dermis layer of adult human skin.
Culture Medium:	Mesenchymal stem cell media, supplemented with recombinant growth factors.
Comments:	HDF cells have a limited lifespan and undergo senescence after a finite number of passages. It is recommended to use low passage cells to maintain their physiological characteristics.

Lung

A549



A549, 10X, Low.



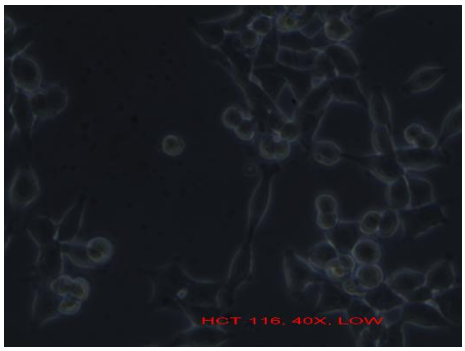
A549, 40X, Low.

Full Name:	A549 cell line.
Organism:	*Homo sapiens* (Human).
Tissue of Origin:	Lung (alveolar epithelium).
Cell Type:	Epithelial.
Disease:	Lung adenocarcinoma.
Morphology:	Epithelial-like reminiscent of squamous lung tissue.
Applications:	Respiratory disease research, viral infection studies (including adenovirus and influenza), drug screening, pulmonary toxicity testing, and cancer biology.
Growth Properties:	Adherent cells forming a monolayer.
Derivation:	Derived from the lung carcinoma tissue of a 58-year-old male patient with pulmonary adenocarcinoma by D.J Giard and associates.
Culture Medium:	DMEM/F-12, supplemented with 10% Fetal Bovine Serum, 1% L-glutamine, 1% penicillin/streptomycin.
Comments:	A549 cells are robust and easy to culture, but experimental outcomes may vary depending on passage number and culture conditions.

Colon

HCT-116

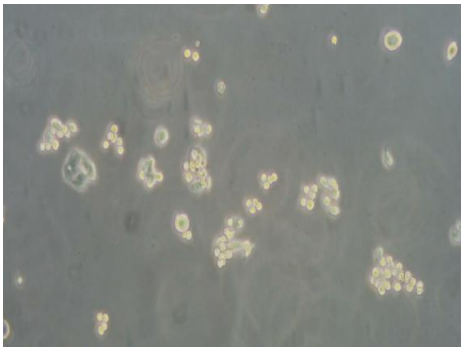
HCT-116, 10X, Low.



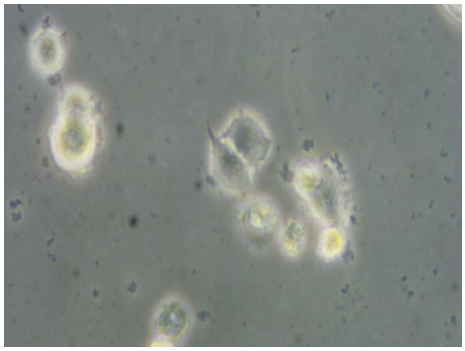
HCT-116, 40X, Low.

Full Name:	HCT-116 cell line.
Organism:	*Homo sapiens* (Human).
Tissue of Origin:	Large intestine (colon).
Cell Type:	Epithelial.
Disease:	Colorectal carcinoma.
Morphology:	Epithelial-like.
Applications:	Colorectal cancer research, studies of tumor progression and aggressiveness, drug screening and chemotherapeutic response, apoptosis and cell cycle regulation, and 3D spheroid models.
Growth Properties:	Adherent cells forming a monolayer.
Derivation:	Isolated from the colon of a 43-year-old male patient with colorectal carcinoma.
Culture Medium:	High-glucose Dulbecco's Modified Eagle Medium, supplemented with 10% Fetal Bovine Serum, 1% L-glutamine, 1% penicillin/streptomycin.
Comments:	Consistent culture conditions are recommended to maintain reproducibility.

SW480



SW480, 10X, Low.

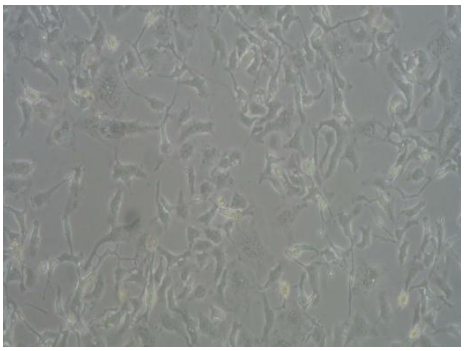


SW480, 40X, Low.

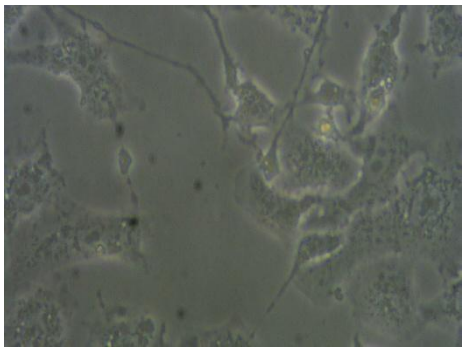
Full Name:	SW480 cell line.
Organism:	*Homo sapiens* (human).
Tissue of Origin:	Large intestine (colon).
Cell Type:	Epithelial.
Disease:	Colorectal adenocarcinoma.
Morphology:	Epithelial-like, growing in adherent clusters.
Applications:	Colorectal cancer research, studies of tumor progression, Wnt/β-catenin signaling, drug screening, and cancer genetics.
Growth Properties:	Adherent cells forming a monolayer.
Derivation:	Derived from a primary adenocarcinoma of the colon from a 50-year-old male patient.
Culture Medium:	High-glucose Dulbecco's Modified Eagle Medium, supplemented with 10% Fetal Bovine Serum, 1% L-glutamine, 1% penicillin/streptomycin.
Comments:	SW480 cells are less metastatic compared to other cell lines.

Liver

HepG2



HepG2, 10X, High.



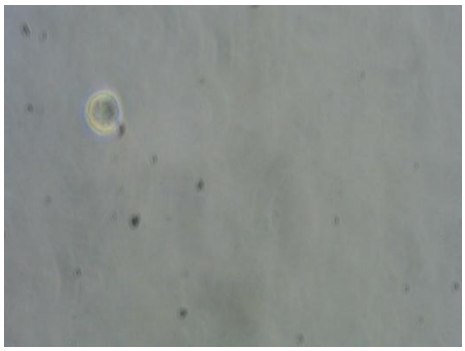
HepG2, 40X, High.

Full Name:	HepG2 cell line.
Organism:	*Homo sapiens* (Human).
Tissue of Origin:	Liver.
Cell Type:	Epithelial.
Disease:	Hepatocellular carcinoma.
Morphology:	Epithelial-like.
Applications:	Hepatotoxicity and drug metabolism studies, liver function and metabolism research, protein synthesis and secretion, intracellular trafficking, and pharmacological testing.
Growth Properties:	Adherent cells forming a monolayer.
Derivation:	Isolated from a hepatocellular carcinoma of a 15-year-old male.
Culture Medium:	Eagle's Minimum Essential Medium (EMEM) supplemented with 10% Fetal Bovine Serum and 1% penicillin/streptomycin.
Comments:	A549 cells can be hard to judge confluency as they form clusters.

Blood

K562

K562, 10X, Low.



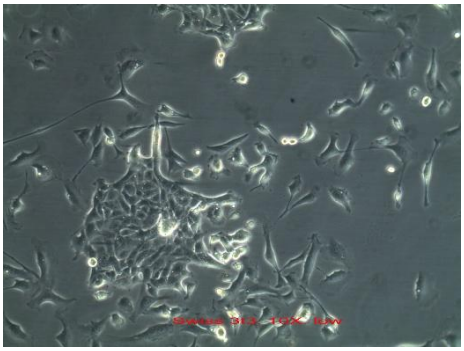
K562, 40X, Low.

Full Name:	K562 cell line.
Organism:	*Homo sapiens* (Human).
Tissue of Origin:	Bone marrow (hematopoietic origin).
Cell Type:	Erythroleukemia lineage.
Disease:	Chronic myelogenous leukemia (CML).
Morphology:	Lymphoblast-like, round, smooth.
Applications:	Hematology and leukemia research, studies of erythroid differentiation, drug screening and development, gene expression and gene editing studies (e.g., CRISPR screens), and immunology research.
Growth Properties:	Suspended (non-adherent).
Derivation:	Isolated from the bone marrow of a 53-year-old female patient with chronic myelogenous leukemia in blast crisis.
Culture Medium:	RPMI-16400 (Roswell Park Memorial Institute), supplemented with 10% Fetal Bovine Serum, 1% L-glutamine, 1% penicillin/streptomycin.
Comments:	K562 cells are highly proliferative and can be induced to differentiate into erythroid, megakaryocytic, or monocytic lineages under appropriate conditions.

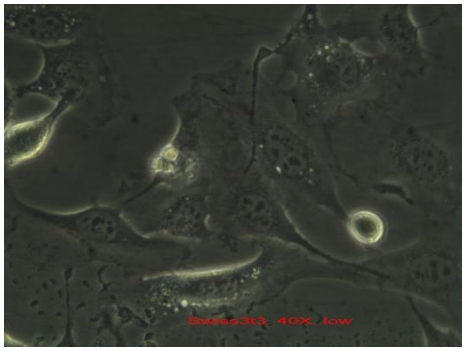
Mouse

Fibroblasts

Swiss 3T3



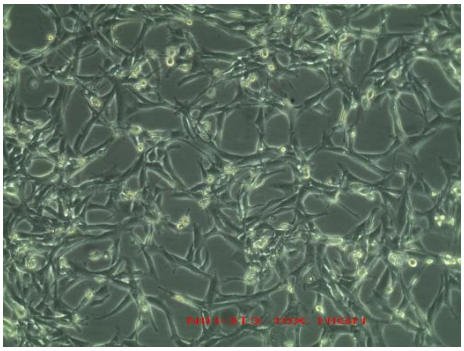
Swiss-3T3, 10X, Low.



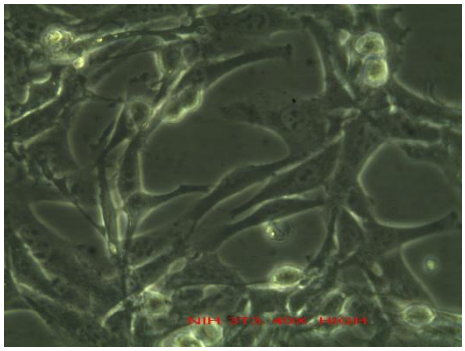
Swiss-3T3, 40X, Low.

Full Name:	3T3-Swiss albino cell line.
Organism:	*Mus musculus* (Swiss albino mouse).
Tissue of Origin:	Embryonic fibroblast.
Cell Type:	Fibroblast.
Disease:	Normal, immortalized, non-tumorigenic.
Morphology:	Fibroblast-like, spindle-shaped cells.
Applications:	Studies of cancer development and progression, cell proliferation and differentiation, signal transduction pathways, and support for monoclonal antibody production (e.g., as feeder layers).
Growth Properties:	Adherent cells forming a monolayer.
Derivation:	Derived from the tissues of a Swiss albino mouse embryo using the “3T3” cell transfer protocol established by George J. Todaro and Howard Green, involving serial passaging at different cell densities. It is one of the first cell lines to be established for the purpose of long-term cultivation.
Culture Medium:	High-glucose Dulbecco’s Modified Eagle Medium, supplemented with 10% Fetal Bovine Serum, 1% L-glutamine, 1% penicillin/streptomycin.
Comments:	3T3 Swiss albino cells exhibit contact inhibition and should be passaged before reaching full confluence to maintain consistent growth behavior. They are commonly used as feeder layers to support the growth of other cell types.

NIH-3T3



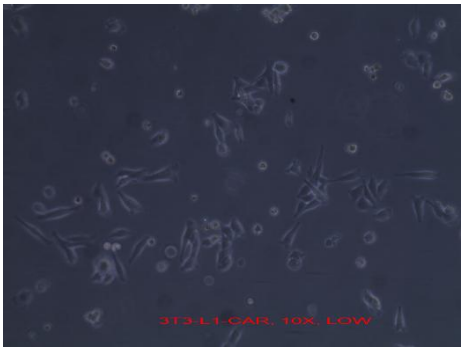
NIH-3T3, 10X, Low.



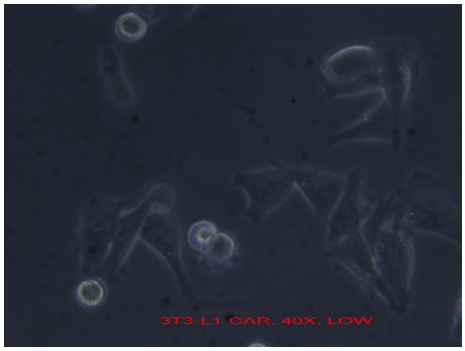
NIH-3T3, 40X, Low.

Full Name:	NIH-3T3 cell line.
Organism:	*Mus musculus* (Swiss albino mouse).
Tissue of Origin:	Embryonic fibroblast.
Cell Type:	Fibroblast.
Disease:	Normal, immortalized, non-tumorigenic.
Morphology:	Fibroblast-like, spindle-shaped cells.
Applications:	Genetic and molecular biology studies, oncogenic transformation research, and virus propagation.
Growth Properties:	Adherent cells forming a monolayer.
Derivation:	Derived from a 17- to 19-day-old mouse embryo using the “3T3” cell transfer protocol established by George J. Todaro and Howard Green, involving serial passaging at different cell densities.
Culture Medium:	High-glucose Dulbecco’s Modified Eagle Medium, supplemented with 10% Fetal Bovine Serum, 1% L-glutamine, 1% penicillin/streptomycin.
Comments:	NIH-3T3 cells exhibit contact inhibition and should be passaged before reaching full confluence to maintain normal growth characteristics.

3T3-L1-CAR



3T3-L1-CAR, 10X, Low.

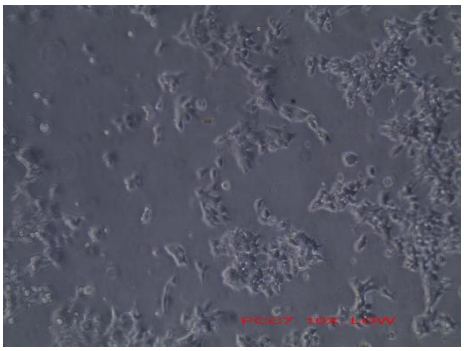


3T3-L1-CAR, 40X, Low.

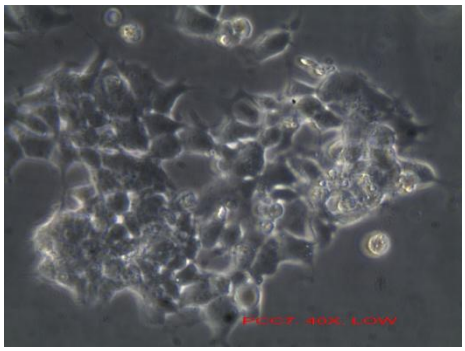
Full Name:	3T3-L1-CAR cell line.
Organism:	*Mus musculus* (Swiss albino mouse).
Tissue of Origin:	Embryonic fibroblast.
Cell Type:	Preadipocyte (fibroblast derived).
Disease:	Normal, immortalized, non-tumorigenic.
Morphology:	Fibroblast-like, spindle-shaped cells that can differentiate into rounded adipocyte-like cells upon induction.
Applications:	Studies of adipogenesis and lipid metabolism, obesity, and diabetes research, insulin signaling pathways, metabolic regulation, and gene knockout studies using CRISPR-Cas9.
Growth Properties:	Adherent cells forming a monolayer.
Derivation:	L1 is a continuous clonal subline of 3T3 (Swiss albino) cell line, developed through clonal isolation. The CAR variant is genetically modified to express the coxsackievirus and adenovirus receptor (CAR), enhancing susceptibility to adenovirus-mediated gene transfer.
Culture Medium:	High-glucose Dulbecco's Modified Eagle Medium, supplemented with 10% Fetal Bovine Serum, 1% L-glutamine, 1% penicillin/streptomycin.
Comments:	3T3-L1-CAR cells should be maintained below full confluence to ensure optimal adipogenic potential.

Embryonal carcinoma stem cell

PCC7



PCC7, 10X, Low.

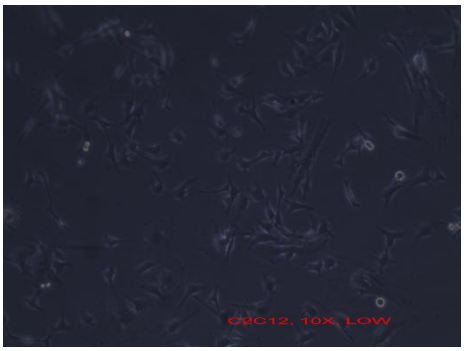


PCC7, 40X, Low.

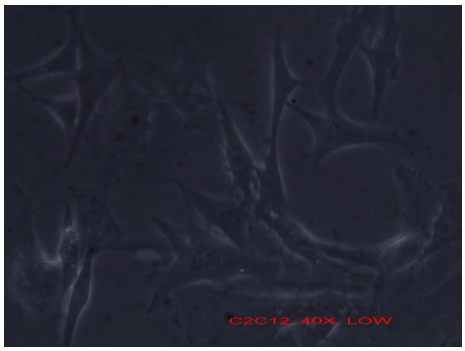
Full Name:	PCC7-Mz1 cell line.
Organism:	*Mus musculus* (Swiss albino mouse).
Tissue of Origin:	Embryonal carcinoma (teratocarcinoma).
Cell Type:	Embryonal carcinoma (pluripotent stem cell-like).
Disease:	Teratocarcinoma.
Morphology:	Undifferentiated cells appear round to polygonal, while differentiated cells may exhibit fibroblast-like or neuronal-like morphology.
Applications:	Studies of pluripotency and early embryonic development, retinoic acid induced differentiation, neuronal differentiation and neurogenesis, gene expression and regulation during differentiation, and developmental toxicology.
Growth Properties:	Adherent cells forming colonies.
Derivation:	Derived from a mouse embryonal carcinoma (teratocarcinoma) tumor.
Culture Medium:	High-glucose Dulbecco's Modified Eagle Medium, supplemented with 10% Fetal Bovine Serum, 1% L-glutamine, 1% penicillin/streptomycin.
Comments:	PCC7 cells are highly sensitive to culture conditions and may spontaneously differentiate if not maintained properly. Differentiation can be induced using retinoic acid.

Muscle

C2C12



C2C12, 10X, Low.

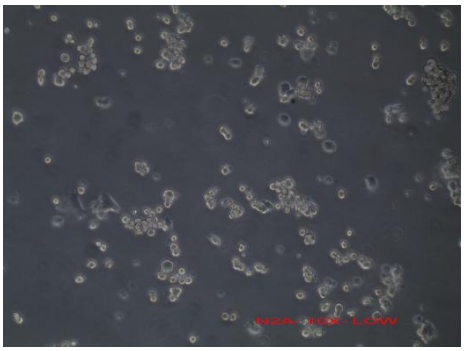


C2C12, 40X, Low.

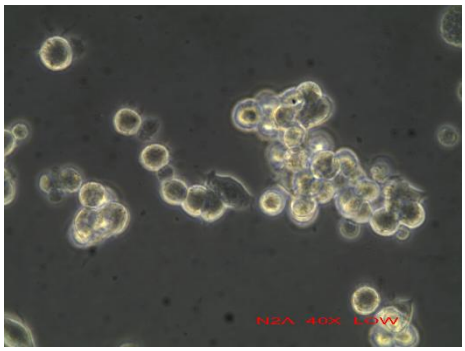
Full Name:	C2C12 cell line.
Organism:	*Mus musculus* (Swiss albino mouse).
Tissue of Origin:	Skeletal muscle.
Cell Type:	Myoblast.
Disease:	Normal (immortalized).
Morphology:	Fibroblast-like, spindle-shaped in their undifferentiated state; fuse to form multinucleated myotubes upon differentiation.
Applications:	Studies of skeletal muscle development and regeneration, myogenesis, muscle differentiation, myofilament function, and metabolic studies.
Growth Properties:	Adherent cells forming a monolayer.
Derivation:	Derived from the skeletal muscle of a 2-month-old female C3H mouse following muscle injury and regeneration.
Culture Medium:	RPMI-16400 (Roswell Park Memorial Institute), supplemented with 10% Fetal Bovine Serum, 1% L-glutamine, 1% penicillin/streptomycin.
Comments:	C2C12 cells readily differentiate into myotubes under low-serum conditions. It is important to avoid over-confluence prior to differentiation, as this can affect fusion efficiency.

Neuronal

N2A



N2A, 10X, Low.



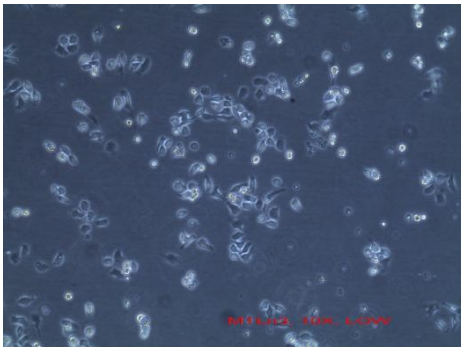
N2A, 40X, Low.

Full Name:	Neuro-2a (N2A) cell line.
Organism:	*Mus musculus* (Swiss albino mouse).
Tissue of Origin:	Neural tissue (neural crest derived).
Cell Type:	Neuroblast (neuronal precursor cells).
Disease:	Neuroblastoma.
Morphology:	Small, round cells that can exhibit neuronal-like morphology.
Applications:	Studies of neurogenesis and neuronal differentiation, dopaminergic signaling and neuroendocrine function, neurodegenerative diseases (e.g., Alzheimer's disease), toxicology.
Growth Properties:	Adherent cells forming a monolayer.
Derivation:	Derived from a spontaneous tumor of a strain A albino mouse by R.J. Klebe and F.H. Ruddle.
Culture Medium:	High-glucose Dulbecco's Modified Eagle Medium, supplemented with 10% Fetal Bovine Serum, 1% L-glutamine, 1% penicillin/streptomycin.
Comments:	N2A cells are usually split when they reach ~70% confluence to prevent detachment or premature differentiation.

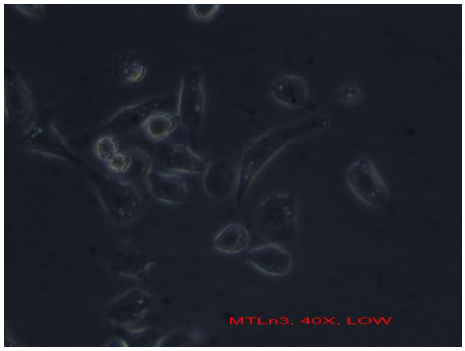
Rat

Breast

MTLn3



MTLn3, 10X, Low.



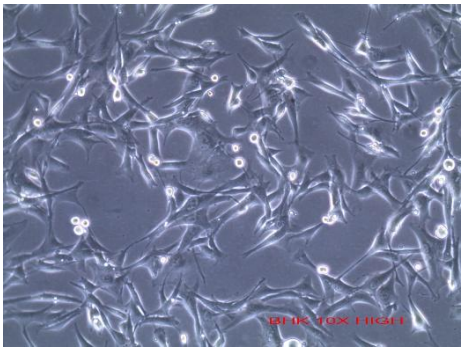
MTLn3, 40X, Low.

Full Name:	MTLn3 cell line.
Organism:	*Rattus norvegicus* (Rat).
Tissue of Origin:	Mammary gland (adenocarcinoma).
Cell Type:	Mammary adenocarcinoma.
Disease:	Adenocarcinoma.
Morphology:	Rounded, epithelial-like cells.
Applications:	Metastasis research, epidermal growth factor (EGF)-induced chemotaxis and cell motility studies, invasion assays, and cancer cell migration signaling pathways.
Growth Properties:	Adherent cells forming a monolayer.
Derivation:	Derived from 13762 rat mammary adenocarcinoma and are known to form lung metastasis.
Culture Medium:	α-MEM (Minimum Essential Medium Eagle – alpha modification) supplemented with 5% Fetal Bovine Serum and 1% penicillin/streptomycin.
Comments:	Careful control of growth conditions is recommended to maintain consistent migratory behavior.

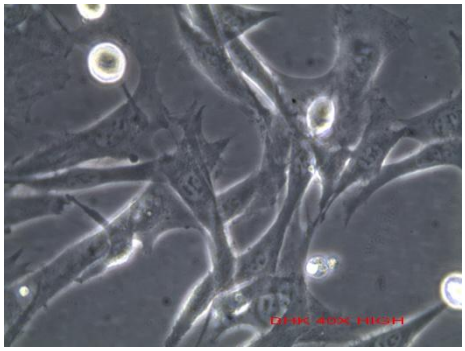
Hamster

Kidney

BHK-21



BHK-21, 10X, High.



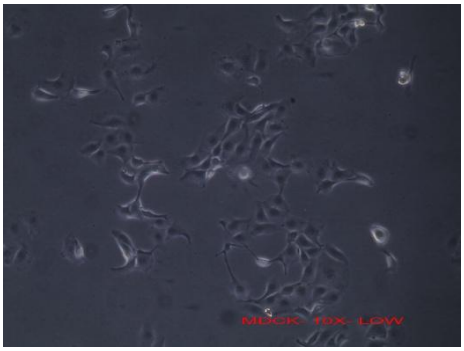
BHK-21, 40X, High.

Full Name:	Baby Hamster Kidney (BHK-21) cell line.
Organism:	*Mesocricetus auratus*, Golden hamster (Syrian hamster).
Tissue of Origin:	Kidney.
Cell Type:	Fibroblast-like cells.
Disease:	Normal, immortalized.
Morphology:	Elongated, fibroblast-like morphology, cells grow in a parallel orientation.
Applications:	Virus propagation, vaccine production, 3D cell culture, high-throughput screening, toxicology, and bioproduction.
Growth Properties:	Adherent cells forming a monolayer.
Derivation:	BHK-21 cells are derived from the kidneys of five unsexed, 1-day old Syrian golden hamsters by I.A. Macpherson and M.G.P. Stoker.
Culture Medium:	High-glucose Dulbecco's Modified Eagle Medium, supplemented with 10% Fetal Bovine Serum, 1% L-glutamine, 1% penicillin/streptomycin.
Comments:	BHK-21 cells proliferate rapidly (~12-16 hours), making it essential to monitor cultures closely to prevent over-confluence, which can reduce cell viability

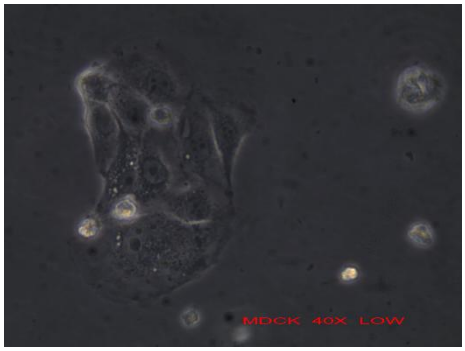
Dog

Kidney

MDCK (NBL-2)



MDCK, 10X, Low.



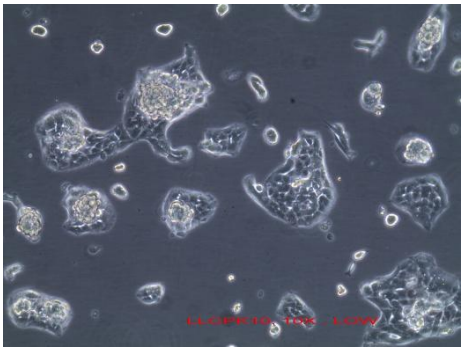
MDCK, 40X, Low.

Full Name:	Madin-Darby Canine Kidney (MDCK) cell line.
Organism:	*Canis lupus familiaris*, (domestic dog, cocker spaniel).
Tissue of Origin:	Kidney (distal tubule).
Cell Type:	Epithelial.
Disease:	Normal, immortalized.
Morphology:	Epithelial-like, forming tight junctions and well-organized monolayers.
Applications:	Studies of epithelial cell polarity and protein trafficking, virus production and vaccine production, 3D cell culture, high-throughput screening, and toxicology studies.
Growth Properties:	Adherent cells forming a monolayer.
Derivation:	Derived from a kidney of a normal adult female cocker spaniel.
Culture Medium:	DMEM/F-12, supplemented with 10% Fetal Bovine Serum, 1% L-glutamine, 1% penicillin/streptomycin.
Comments:	MDCK cells form strong cell-cell junctions which make them difficult to detach. Enzymatic dissociation may require extended trypsinization or higher trypsin concentrations.

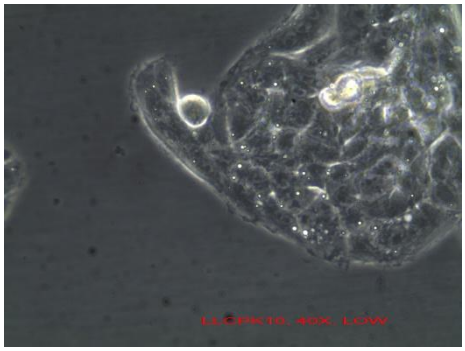
Pig

Kidney

LLC-PK1



LLC-PK1, 10X, Low.



LLC-PK1, 40X, Low.

Full Name:	LLC-PK1 (Porcine Kidney) cell line.
Organism:	*Sus scrofa* (Hampshire pig).
Tissue of Origin:	Kidney (proximal tubule).
Cell Type:	Renal proximal tubule epithelial cells.
Disease:	Normal (non-tumorigenic).
Morphology:	Epithelial-like cells that form characteristic “domes” in culture.
Applications:	Studies of epithelial transport and ion flux, drug absorption and metabolism research, permeability assays, and renal physiology.
Growth Properties:	Adherent cells forming a polarized monolayer.
Derivation:	Derived from a healthy male pig’s kidney. LLC-PK1 cells form strong tight junctions.
Culture Medium:	Low-glucose Dulbecco’s Modified Eagle Medium (DMEM) supplemented with 10% Fetal Bovine Serum (FBS), 1% L-glutamine, 1% penicillin–streptomycin.
Comments:	Appropriate confluence should be maintained to preserve this cell line’s characteristics.