Credible Assays, Incredible Results

You don’t have time to waste on failed experiments and incorrect results; you must get your in vitro toxicology testing right the first time. ATCC’s high-quality, authenticated materials ensure that misidentification, growth problems, and donor variability issues don’t slow you down. ATCC proudly offers a wide variety of cells, microorganisms, and assay materials for physiologically-relevant toxicology testing and research, including our human telomerase reverse transcriptase (hTERT)-immortalized primary cells.

Continuous Cell Lines

ATCC is home to over 4,000 continuous human and animal cell lines that can be used to refine traditional cell-based experiments or construct high-throughput assays, reducing the need for in vivo studies. Our continuous cell lines are always authenticated so you can rest assured that your in vitro models will deliver experimental success.

Human Primary Cells

Human primary cells closely mimic the physiological state of cells in vivo and generate relevant data representing living systems. ATCC offers quality human primary cells matched with optimized growth media and supplements and a superior viability guarantee.

- Most cells expand to 15 population doublings
- Post-thaw viability greater than 70%
- All cells tested for positive and negative surface markers
- High cell purity guaranteed
- Additional donor information available

hTERT-Immortalized Primary Cells

The best of both worlds: ATCC hTERT-immortalized primary cells are a revolutionary breakthrough in cell biology research. hTERT-immortalized primary cells do not senesce after a few passages, thereby reducing the need to repurchase and initiate growth of primary cells. Unlike continuous cell lines, these cells exhibit a stable karyotype and genotype and retain many of the physiological characteristics of the parental cells.

- In vivo biologies observed at high passage
- Average lifespan 5 times longer than primary cells
- Gene expression similar to the parental cell
- Zero donor (lot-to-lot) variability
Cytotoxicity

Find potential viability issues early with ATCC’s wide array of biological solutions such as rodent and human cell lines, primary cells, and stem cells, including our new upcyte® Hepatocytes. We also offer assay kits such as the MTT assay, the XTT assay, and our resazurin-based Reliablue™ assay to measure your cell viability and growth.

Table 1. Human Primary Cells

<table>
<thead>
<tr>
<th>ATCC® No.</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCS-100-013™</td>
<td>Human Umbilical Vein Endothelial Cells</td>
</tr>
<tr>
<td>PCS-201-010™</td>
<td>Normal Human Dermal Fibroblasts (Neonatal)</td>
</tr>
<tr>
<td>PCS-201-012™</td>
<td>Normal Human Dermal Fibroblasts (Adult)</td>
</tr>
<tr>
<td>PCS-400-010™</td>
<td>RPTEC Human Renal Proximal Tubular Epithelial Cells</td>
</tr>
<tr>
<td>PCS-500-010™</td>
<td>Human Umbilical Cord-derived Mesenchymal Stem Cells</td>
</tr>
</tbody>
</table>

Table 2. Cell Proliferation Assay Kits

<table>
<thead>
<tr>
<th>ATCC® No.</th>
<th>Designation</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-1010K™</td>
<td>MTT Cell Proliferation Assay Kit</td>
<td>Spectrophotometric measurement of cell viability and growth</td>
</tr>
<tr>
<td>30-1011K™</td>
<td>XTT Cell Proliferation Assay Kit</td>
<td>Measurement of cell viability and growth in tumor cell lines</td>
</tr>
<tr>
<td>30-1014™</td>
<td>Reliablue™ Cell Viability Reagent</td>
<td>Assessment of cell viability, cytotoxicity, metabolism, and proliferation</td>
</tr>
</tbody>
</table>

Reliablue™

ATCC has developed Reliablue™ (ATCC® 30-1014™), a resazurin-based cell proliferation assay that is sensitive and non-toxic to cells. It is designed to be used in a 96 (or greater) well plate, and can be used for compound screening in a high throughput format.

Figure 1. Reliablue-derived viability curves. (A) MDA-MB-231 cells, (B) A549 cells, and (C) primary human keratinocytes were seeded at the indicated number per well in 96-well plates and incubated with Reliablue for the indicated times at 37°C/5% CO₂. The fluorescent signal was recorded at ex570/em590.
Absorption, Distribution, Metabolism, and Elimination (ADME) Assays

Testing for absorption, distribution, metabolism, and elimination is crucial to moving your product to market. Get closer results to those observed in vivo and rule out possible toxicities faster using our entire ADME portfolio, featuring our hTERT-immortalized OAT1-, OCT2-, and OAT3-expressing kidney transporter cells. ATCC is here to support your preclinical research with our renal and hepatic models to be used in metabolic stability, metabolite identification, and drug-drug interaction assays.

### Table 3: Hepatic cells

<table>
<thead>
<tr>
<th>ATCC® No.</th>
<th>Designation</th>
<th>Product Description</th>
<th>Disease State</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACS-9000™</td>
<td>upcyte® Hepatocytes</td>
<td>Homo sapiens; liver; immortalized cell line</td>
<td>Normal</td>
</tr>
<tr>
<td>CRL-2254™</td>
<td>AML-12</td>
<td>Mus Musculus; liver; primary cells</td>
<td>Normal</td>
</tr>
<tr>
<td>CRL-2643™</td>
<td>ZFL [2F-L]</td>
<td>Danio rerio; liver; immortalized cell line</td>
<td>Normal</td>
</tr>
<tr>
<td>CRL-10741™</td>
<td>C3A [HepG2/C3A, derivative of Hep G2]</td>
<td>Homo sapiens; liver; immortalized cell line</td>
<td>Hepatocellular carcinoma</td>
</tr>
<tr>
<td>CRL-11233™</td>
<td>THLE-3</td>
<td>Homo sapiens; liver; immortalized cell line</td>
<td>Hepatocellular carcinoma</td>
</tr>
<tr>
<td>HB-8065™</td>
<td>Hep G2</td>
<td>Homo sapiens; liver; immortalized cell line</td>
<td>Hepatocellular carcinoma</td>
</tr>
</tbody>
</table>

### Table 4: Human Hepatocyte Medium Kit

<table>
<thead>
<tr>
<th>ATCC® No.</th>
<th>Designation</th>
<th>Basal medium</th>
<th>Medium Supplements</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ACS-9005™</td>
<td>Hepatocyte High Performance Medium Kit</td>
<td>Hepatocyte High Performance Medium (ATCC® ACS-9001™)</td>
<td>Hepatocyte High Performance Medium Supplements (ATCC® ACS-9002™)</td>
<td></td>
</tr>
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</table>

### Table 5: Renal Cell Lines

<table>
<thead>
<tr>
<th>ATCC® No.</th>
<th>Designation</th>
<th>Source Tissue</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRL-1573™</td>
<td>293 [HEK-293]</td>
<td>Embryonic kidney</td>
</tr>
<tr>
<td>CRL-2190™</td>
<td>HK-2</td>
<td>Kidney, cortex/proximal tubule</td>
</tr>
<tr>
<td>CRL-3213™</td>
<td>Phoenix-AMPHO</td>
<td>Kidney</td>
</tr>
<tr>
<td>CRL-11268™</td>
<td>293T/17 [HEK-293T/17]</td>
<td>Embryonic kidney</td>
</tr>
<tr>
<td>CRL-11268G-1™</td>
<td>OAT1 HEK 293T/17</td>
<td>Embryonic kidney stably overexpresses OAT1</td>
</tr>
<tr>
<td>HTB-44™</td>
<td>A-498</td>
<td>Kidney carcinoma</td>
</tr>
<tr>
<td>HTB-46™</td>
<td>Caki-1</td>
<td>Kidney; derived from metastatic site: skin</td>
</tr>
</tbody>
</table>

### Table 6: Primary Renal Cells with Optimized Growth Media and Supplements

<table>
<thead>
<tr>
<th>ATCC® No.</th>
<th>Designation</th>
<th>Growth kit</th>
<th>Basal medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCS-400-010™</td>
<td>Renal Proximal Tubule Epithelial Cells</td>
<td>Renal Epithelial Cell Growth Kit (ATCC® PCS-400-040™)</td>
<td>Renal Epithelial Cell Basal Medium (ATCC® PCS-400-030™)</td>
</tr>
<tr>
<td>PCS-400-011™</td>
<td>Renal Cortical Epithelial Cells</td>
<td>Renal Epithelial Cell Growth Kit (ATCC® PCS-400-040™)</td>
<td>Renal Epithelial Cell Basal Medium (ATCC® PCS-400-030™)</td>
</tr>
<tr>
<td>PCS-400-012™</td>
<td>Renal Mixed Epithelial Cells</td>
<td>Renal Epithelial Cell Growth Kit (ATCC® PCS-400-040™)</td>
<td>Renal Epithelial Cell Basal Medium (ATCC® PCS-400-030™)</td>
</tr>
</tbody>
</table>

### Table 7: hTERT-Immortalized Primary Renal Cells, Genetically Modified Models, and Optimized Media and Growth Supplement

<table>
<thead>
<tr>
<th>ATCC® No.</th>
<th>Designation</th>
<th>Growth kit</th>
<th>Basal medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRL-4031™</td>
<td>RPTEC/TERT1</td>
<td>DMEM: F-12 Medium (ATCC® 30-2006™)</td>
<td>hTERT-immortalized RPTEC Growth Kit (ATCC® ACS-4007™)</td>
</tr>
<tr>
<td>CRL-4031-OAT1™</td>
<td>RPTEC/TERT1 OAT1</td>
<td>DMEM: F-12 Medium (ATCC® 30-2006™)</td>
<td>hTERT-immortalized RPTEC Growth Kit (ATCC® ACS-4007™)</td>
</tr>
<tr>
<td>CRL-4031-OCT2™</td>
<td>RPTEC/TERT1 OCT2</td>
<td>DMEM: F-12 Medium (ATCC® 30-2006™)</td>
<td>hTERT-immortalized RPTEC Growth Kit (ATCC® ACS-4007™)</td>
</tr>
<tr>
<td>CRL-4031-OAT3™</td>
<td>RPTEC/TERT1 OAT3</td>
<td>DMEM: F-12 Medium (ATCC® 30-2006™)</td>
<td>hTERT-immortalized RPTEC Growth Kit (ATCC® ACS-4007™)</td>
</tr>
</tbody>
</table>
**Figure 2.** Kidney transporter over-expressing cell lines as compared to parental RPTEC/TERT1 cell lines. RPTEC/TERT1 SLC transporter cells were subjected to dome formation assay. Epithelial barrier formation is not compromised in OAT1-, OCT2-, and OAT3-expressing cell lines, as demonstrated by the formation of dome-like structures (arrows) caused by solute transport across an intact epithelial barrier.

**Figure 3.** Drug kinetic profiles of RPTEC/TERT1-OAT1 and RPTEC/TERT1-OCT2 transporter cells. (A) Solute uptake activity of RPTEC/TERT1-OAT1 cells was assessed using 6-CF as a substrate. 6-CF uptake increases with increasing 6-CF concentration in OAT1-expressing cells but not in parental RPTEC/TERT1 cells (n=3), indicating that the observed transport is due to OAT1 expression. (B) Solute uptake activity of RPTEC/TERT1-OCT2 cells was assessed by using EAM-1 as substrate. EAM-1 uptake increases with increasing amounts of EAM-1 in OCT2-expressing cells but not in parental RPTEC/TERT1 cells (n=3), indicating that the observed solute transport is due to OCT2 expression. (C) OAT1-expressing cells were exposed to increasing concentrations of the known OAT1 inhibitor novobiocin while 6-CF concentration and uptake time were held constant at 3 µM and 20 minutes (n=3). D) OCT2-expressing cells were exposed to increasing concentrations of the known OCT2 inhibitor quinitin while EAM-1 concentration and uptake time were held constant at 5 µM and 20 minutes (n=3). The resulting inhibition curves indicate that OAT1 and OCT2 have physiologically relevant transport activity when overexpressed in RPTEC/TERT1 cells.
Neurotoxicity

Cells of the nervous system are well-specialized and rarely undergo mitosis once differentiated. ATCC offers many cell lines derived from neural tissues and neural progenitor cells that can be easily differentiated into those needed for neurotoxicity studied. Work with differentiating or terminally differentiated neurons, astrocytes, and oligodendrocytes sooner—yield experimental results faster.

Table 8. Human and Animal Neural Tissue-Derived Cell Lines

<table>
<thead>
<tr>
<th>ATCC® No.</th>
<th>Designation</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACS-1018™</td>
<td>BT142 mut/-</td>
<td>Brain; oligoastrocytoma grade III</td>
</tr>
<tr>
<td>CCL-107™</td>
<td>C6</td>
<td>Brain, glial; glioma</td>
</tr>
<tr>
<td>CRL-1721™</td>
<td>PC-12</td>
<td>Adrenal; pheochromocytoma</td>
</tr>
<tr>
<td>CRL-2266™</td>
<td>SH-SY5Y</td>
<td>Bone marrow, epithelial; neuroblastoma</td>
</tr>
<tr>
<td>CRL-2927™</td>
<td>LUHMES</td>
<td>Brain, embryonic mesencephalon</td>
</tr>
<tr>
<td>CRL-2941™</td>
<td>S16</td>
<td>Sciatic nerve, epithelial</td>
</tr>
<tr>
<td>CRL-2943™</td>
<td>S16Y</td>
<td>Sciatic nerve, schwann cell</td>
</tr>
<tr>
<td>CRL-10742™</td>
<td>HCN-2</td>
<td>Cortical neuron; encephalitis</td>
</tr>
</tbody>
</table>

Table 9. Neural Progenitor Cells with Media Supplement Kits

<table>
<thead>
<tr>
<th>ATCC® No.</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACS-3003™</td>
<td>NPC Growth Kit</td>
</tr>
<tr>
<td>ACS-3004™</td>
<td>NPC Dopaminergic Differentiation Kit</td>
</tr>
<tr>
<td>ACS-5001™</td>
<td>NPCs derived from ATCC-DYS0530 Parkinson’s Disease (ACS-1013)</td>
</tr>
<tr>
<td>ACS-5003™</td>
<td>NPCs derived from ATCC-BXS0117 (ACS-1031)</td>
</tr>
<tr>
<td>ACS-5004™</td>
<td>NPCs derived from ATCC-BYS0112 (ACS-1026)</td>
</tr>
<tr>
<td>ACS-5005™</td>
<td>Neural Progenitor Cells derived from XCL-1 DCX-GFP</td>
</tr>
<tr>
<td>ACS-5006™</td>
<td>Neural Progenitor Cells derived from XCL-1 GFAP-Nanoluc®-Halotag®</td>
</tr>
<tr>
<td>ACS-5007™</td>
<td>Neural Progenitor Cells derived from XCL-1 MAP2-Nanoluc®-Halotag®</td>
</tr>
</tbody>
</table>

Figure 4. Dose response curves for cell viability of NPCs treated with paclitaxel, cisplatin, piperine, vincristine, chlorhexidine, amiodarone, and hydroxyurea for two days. Paclitaxel, vincristine, and amiodarone significantly decreased viability (p < 0.01) of NPCs (n=3, *p < 0.05, **p < 0.01, ***p < 0.001 vs. DMSO control, Student’s T-test).
## Skin Corrosion, Sensitization, and Irritation Testing

ATCC offers a wide selection of cell lines, primary cells, and hTERT-immortalized cells for modeling of the skin. In addition, we supply media and supplements that support cell culture conditions in the presence or absence of serum. These products can be utilized to create 3D skin models or used in basic assays that comply with OECD standards.

<table>
<thead>
<tr>
<th>Cell Type</th>
<th>Product Name</th>
<th>ATCC® No.</th>
<th>Growth Kit</th>
<th>Basal Media</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keratinocytes</td>
<td>Epidermal Keratinocytes; Adult</td>
<td>PCS-200-011™</td>
<td>Keratinocyte Growth Kit (ATCC® No. PCS-200-040™)</td>
<td>Dermal Cell Basal Medium (ATCC® No. PCS-200-030™)</td>
</tr>
<tr>
<td></td>
<td>Epidermal Keratinocytes; Neonatal Foreskin</td>
<td>PCS-200-010™</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Melanocytes</td>
<td>Epidermal Melanocytes; Adult</td>
<td>PCS-200-013™</td>
<td>Melanocyte Growth Kit (ATCC® No. PCS-200-041™)</td>
<td>Dermal Cell Basal Medium (ATCC® No. PCS-200-030™)</td>
</tr>
<tr>
<td></td>
<td>Epidermal Melanocytes; Neonatal Foreskin</td>
<td>PCS-200-012™</td>
<td>Adult Melanocyte Growth Kit (ATCC® No. PCS-200-042™)</td>
<td></td>
</tr>
<tr>
<td>Fibroblasts</td>
<td>Dermal Fibroblasts; Adult</td>
<td>PCS-201-012™</td>
<td>Fibroblast Growth Kit, Serum-free (ATCC® No. PCS-201-040™) or Fibroblast Growth Kit, Low Serum (ATCC® No. PCS-201-041™)</td>
<td>Fibroblast Basal Medium (ATCC® No. PCS-201-030™)</td>
</tr>
<tr>
<td></td>
<td>Dermal Fibroblasts; Neonatal</td>
<td>PCS-201-010™</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dermal Fibroblasts; Neonatal, Mitomicin C-treated</td>
<td>PCS-201-011™</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 10: hTERT-Immortalized Primary Cells

<table>
<thead>
<tr>
<th>ATCC® No.</th>
<th>Designation</th>
<th>Tissue</th>
<th>Disease State</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRL-4001™</td>
<td>BJ-5Ta</td>
<td>Foreskin, fibroblast</td>
<td>normal</td>
</tr>
<tr>
<td>CRL-4005™</td>
<td>TelCOFS02MA</td>
<td>Skin, fibroblast</td>
<td>cerebro-oculo-facio-skeletal syndrome</td>
</tr>
<tr>
<td>CRL-4048™</td>
<td>Ker-CT</td>
<td>Foreskin, keratinocyte</td>
<td>normal</td>
</tr>
<tr>
<td>CRL-4059™</td>
<td>hTERT-immortalized Dermal Melanocyte</td>
<td>Skin, female</td>
<td>normal</td>
</tr>
</tbody>
</table>

### Table 11: Human Cell Lines

<table>
<thead>
<tr>
<th>ATCC® No.</th>
<th>Designation</th>
<th>Species</th>
<th>Cell Type and Disease State</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRL-1872™</td>
<td>A375.S2</td>
<td>Homo sapiens</td>
<td>malignant melanoma</td>
</tr>
<tr>
<td>CRL-2309™</td>
<td>CCD 1106 KERTr</td>
<td>Homo sapiens</td>
<td>keratinocyte</td>
</tr>
<tr>
<td>CRL-2310™</td>
<td>CCD 1102 KERTr</td>
<td>Homo sapiens</td>
<td>keratinocyte; human papillomavirus 16</td>
</tr>
<tr>
<td>CRL-2404™</td>
<td>HEK001</td>
<td>Homo sapiens</td>
<td>keratinocyte</td>
</tr>
<tr>
<td>CRL-2500™</td>
<td>A7 [M2A7]</td>
<td>Homo sapiens</td>
<td>melanoma</td>
</tr>
<tr>
<td>CRL-3232™</td>
<td>VMM917</td>
<td>Homo sapiens</td>
<td>melanoma, Stage IV; malignant</td>
</tr>
<tr>
<td>CRL-9446™</td>
<td>CHL-1</td>
<td>Homo sapiens</td>
<td>melanoma</td>
</tr>
<tr>
<td>HTB-72™</td>
<td>SK-MEL-28</td>
<td>Homo sapiens</td>
<td>malignant melanoma</td>
</tr>
</tbody>
</table>
Figure 5. Micrograph of hTERT-immortalized Primary Keratinocytes (Ker-CT) at 11 days post airlift. A) Phase contrast micrograph at 10x magnification. Panels B-E show keratinocytes stained with (B) DAPI, (C) anti-KRT14 antibodies, (D) anti-filaggrin antibodies, or (E) an overlay.

Figure 6. Treatment of skin models with 1% Triton X-100 to test the ability of these models to resist penetration. Ker-CT or primary keratinocytes with (A) collagen raft and (B) without collagen raft were treated with 1% Triton™ X-100 (Dow) at different durations. Viability was measured with MTT (ATCC® No. 30-1010K™). Dashed lines indicate the IC50, which are within the Organization for Economic Co-operation Development (OECD) guidelines of 4-10 hours for functional human skin models.
Genotoxicity

*In vitro* genotoxicity testing is made easy with ATCC materials. We offer the cells and bacteria you need for OECD-validated assays such as the bacterial reverse mutation test (Ames test), the *in vitro* mammalian chromosomal aberration test, and the *in vitro* mammalian cell micronucleus test.

### Table 12: Human and Animal Cell Lines

<table>
<thead>
<tr>
<th>ATCC® No.</th>
<th>Designation</th>
<th>Species</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCL-61™</td>
<td>CHO-K1</td>
<td><em>Cricetulus griseus</em></td>
<td>epithelial-like ovary cell line</td>
</tr>
<tr>
<td>CCL-93™</td>
<td>V79-4</td>
<td><em>Cricetulus griseus</em></td>
<td>lung, fibroblast</td>
</tr>
<tr>
<td>CRL-1935™</td>
<td>CHL/1U [CHL-11]</td>
<td><em>Cricetulus griseus</em></td>
<td>lung, fibroblast, female, newborn</td>
</tr>
<tr>
<td>CRL-8015™</td>
<td>TK6</td>
<td><em>Homo sapiens</em></td>
<td>lymphoblast</td>
</tr>
<tr>
<td>CRL-9518™</td>
<td>L5178Y TK+/– Clone (3.7.2C)</td>
<td><em>Mus musculus</em></td>
<td>lymphoblast, lymphoma</td>
</tr>
</tbody>
</table>

### Table 13: Bacteria

<table>
<thead>
<tr>
<th>ATCC® No.</th>
<th>Species</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAA-2720™</td>
<td><em>Salmonella enterica</em> subsp. <em>enterica</em> serovar <em>Typhimurium</em></td>
<td>LT2 TA98</td>
</tr>
<tr>
<td>BAA-2721™</td>
<td><em>Salmonella enterica</em> subsp. <em>enterica</em> serovar <em>Typhimurium</em></td>
<td>LT2 TA100</td>
</tr>
<tr>
<td>BAA-2722™</td>
<td><em>Salmonella enterica</em> subsp. <em>enterica</em> serovar <em>Typhimurium</em></td>
<td>LT2 TA102</td>
</tr>
<tr>
<td>29629™</td>
<td><em>Salmonella enterica</em> subsp. <em>enterica</em> serovar <em>Typhimurium</em></td>
<td>TA1535</td>
</tr>
<tr>
<td>29630™</td>
<td><em>Salmonella enterica</em> subsp. <em>enterica</em> serovar <em>Typhimurium</em></td>
<td>TA1537</td>
</tr>
<tr>
<td>49979™</td>
<td><em>Escherichia coli</em></td>
<td>WP2 uvrA</td>
</tr>
</tbody>
</table>

Respiratory Toxicity

ATCC® offers primary airway epithelial cells, smooth muscle cells (SMCs), and fibroblasts, as well as growth media and media supplements for *in vitro* models to boost the scientific relevance of upper respiratory studies. Our materials make it simple to test for tissue variability, cytotoxicity, and more.

### Table 14: Human Primary Airway Cells; Normal

<table>
<thead>
<tr>
<th>ATCC® No.</th>
<th>Designation</th>
<th>Growth kit</th>
<th>Basal medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCS-130-010™</td>
<td>Lung Smooth Muscle Cells</td>
<td>Vascular Smooth Muscle Cell Growth Kit (ATCC® PCS-100-042™)</td>
<td>Vascular Cell Basal Medium (ATCC® PCS-100-030™)</td>
</tr>
<tr>
<td>PCS-130-013™</td>
<td>Bronchial/Tracheal Smooth Muscle Cells</td>
<td>Vascular Smooth Muscle Cell Growth Kit (ATCC® PCS-100-042™)</td>
<td>Vascular Cell Basal Medium (ATCC® PCS-100-030™)</td>
</tr>
<tr>
<td>PCS-201-013™</td>
<td>Lung Fibroblasts</td>
<td>Fibroblast Growth Kit, Low Serum (ATCC® PCS-201-041™)</td>
<td>Fibroblast Basal Medium (ATCC® PCS-201-030™)</td>
</tr>
<tr>
<td>PCS-301-010™</td>
<td>Small Airway Epithelial Cells</td>
<td>Bronchial Epithelial Cell Growth kit (ATCC® PCS-300-040™)</td>
<td>Airway Epithelial Cell Basal Medium (ATCC® PCS-300-030™)</td>
</tr>
</tbody>
</table>

### Table 15: Human Primary Airway Cells; Disease

<table>
<thead>
<tr>
<th>ATCC® No.</th>
<th>Designation</th>
<th>Growth kit</th>
<th>Basal medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCS-201-015™</td>
<td>Lung Fibroblasts; Asthma</td>
<td>Fibroblast Growth Kit, Low Serum (ATCC® PCS-201-041™)</td>
<td>Fibroblast Basal Medium (ATCC® PCS-201-030™)</td>
</tr>
<tr>
<td>PCS-201-016™</td>
<td>Lung Fibroblasts; Cystic Fibrosis</td>
<td>Fibroblast Growth Kit, Low Serum (ATCC® PCS-201-041™)</td>
<td>Fibroblast Basal Medium (ATCC® PCS-201-030™)</td>
</tr>
<tr>
<td>PCS-201-017™</td>
<td>Lung Fibroblasts; COPD</td>
<td>Fibroblast Growth Kit, Low Serum (ATCC® PCS-201-041™)</td>
<td>Fibroblast Basal Medium (ATCC® PCS-201-030™)</td>
</tr>
<tr>
<td>PCS-201-020™</td>
<td>Lung Fibroblast; Fibrosis</td>
<td>Fibroblast Growth Kit, Low Serum (ATCC® PCS-201-041™)</td>
<td>Fibroblast Basal Medium (ATCC® PCS-201-030™)</td>
</tr>
<tr>
<td>PCS-300-011™</td>
<td>Bronchial/Tracheal Epithelial Cells; Asthma</td>
<td>Bronchial Epithelial Cell Growth kit (ATCC® PCS-300-040™)</td>
<td>Airway Epithelial Cell Basal Medium (ATCC® PCS-300-030™)</td>
</tr>
<tr>
<td>PCS-300-013™</td>
<td>Bronchial/Tracheal Epithelial Cells; COPD</td>
<td>Bronchial Epithelial Cell Growth kit (ATCC® PCS-300-040™)</td>
<td>Airway Epithelial Cell Basal Medium (ATCC® PCS-300-030™)</td>
</tr>
<tr>
<td>PCS-300-014™</td>
<td>Bronchial/Tracheal Epithelial Cells; Fibrosis</td>
<td>Bronchial Epithelial Cell Growth kit (ATCC® PCS-300-040™)</td>
<td>Airway Epithelial Cell Basal Medium (ATCC® PCS-300-030™)</td>
</tr>
<tr>
<td>PCS-301-013™</td>
<td>Small Airway Epithelial Cells; Asthma</td>
<td>Bronchial Epithelial Cell Growth kit (ATCC® PCS-300-040™)</td>
<td>Airway Epithelial Cell Basal Medium (ATCC® PCS-300-030™)</td>
</tr>
<tr>
<td>PCS-301-014™</td>
<td>Small Airway Epithelial Cells; COPD</td>
<td>Bronchial Epithelial Cell Growth kit (ATCC® PCS-300-040™)</td>
<td>Airway Epithelial Cell Basal Medium (ATCC® PCS-300-030™)</td>
</tr>
<tr>
<td>PCS-301-015™</td>
<td>Small Airway Epithelial Cells; Fibrosis</td>
<td>Bronchial Epithelial Cell Growth kit (ATCC® PCS-300-040™)</td>
<td>Airway Epithelial Cell Basal Medium (ATCC® PCS-300-030™)</td>
</tr>
</tbody>
</table>
Table 16: HTERT-Immortalized Primary Airway Cells

<table>
<thead>
<tr>
<th>ATCC® No.</th>
<th>Designation</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRL-4011™</td>
<td>NuLi-1</td>
<td>Lung, epithelium; normal</td>
</tr>
<tr>
<td>CRL-4013™</td>
<td>CuFi-1</td>
<td>Lung, epithelial; cystic fibrosis</td>
</tr>
<tr>
<td>CRL-4015™</td>
<td>CuFi-4</td>
<td>Lung, bronchial; cystic fibrosis</td>
</tr>
<tr>
<td>CRL-4016™</td>
<td>CuFi-5</td>
<td>Lung, epithelial; cystic fibrosis</td>
</tr>
<tr>
<td>CRL-4017™</td>
<td>CuFi-6</td>
<td>Lung, bronchial; cystic fibrosis</td>
</tr>
<tr>
<td>CRL-4050™</td>
<td>HSAEC1-KT</td>
<td>Lung, small airway; normal</td>
</tr>
<tr>
<td>CRL-4051™</td>
<td>HBEC3-KT</td>
<td>Lung, bronchial; normal</td>
</tr>
</tbody>
</table>

Table 17: Human Cell Lines

<table>
<thead>
<tr>
<th>ATCC® No.</th>
<th>Designation</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCL-153™</td>
<td>HFL1</td>
<td>Lung</td>
</tr>
<tr>
<td>CCL-185™</td>
<td>A549</td>
<td>Lung</td>
</tr>
<tr>
<td>CRL-1848™</td>
<td>NCI-H292</td>
<td>Lung, mucoepidermoid pulmonary carcinoma</td>
</tr>
<tr>
<td>CRL-5826™</td>
<td>NCI-H226</td>
<td>Lung, squamous cell carcinoma, mesothelioma</td>
</tr>
<tr>
<td>CRL-9609™</td>
<td>BEAS-2B</td>
<td>Lung, bronchial</td>
</tr>
<tr>
<td>HTB-55™</td>
<td>Calu-3</td>
<td>Lung, epithelial, adenocarcinoma</td>
</tr>
<tr>
<td>HTB-174™</td>
<td>NCI-H441</td>
<td>Lung, papillary adenocarcinoma</td>
</tr>
</tbody>
</table>

Figure 7: Primary HBECs form differentiated airway epithelial structures in an air-liquid interface cell culture model. Primary bronchial/tracheal epithelial cells at 28 days post airlift, and then stained with A) H&E, indicating cilia (black arrows) and goblet cells. B) Cross sections of the cells reveal PAS/Alcian blue stained-vesicles (white arrows), which suggest mucus synthesis. These results have also been observed in primary small airway cells.

Figure 8: Differentiated primary respiratory epithelial cells secrete mucus. Small airway and bronchial/tracheal epithelial cells were grown in airlift 3D culture as in Figure 7. MUC5AC (an indicator of mucus secretion) was monitored via ELISA from the supernatant after a PBS wash or from the lysate of the cells. The observed expression and secretion of MUC5AC, coupled with the airway-type structures seen in Figure 7 suggests that primary airway cells can be used as an in vitro model of the respiratory lining.
Immunotoxicity

Immunotoxicity testing is a vital step to ensure the safety of a product, especially for medical devices. New *in vitro* methods can help identify immunosuppressants and immunostimulants as well as hypersensitivity and autoimmunity before you spend valuable time and resources on *in vivo* methods. ATCC offers high-quality cells that can be used for immunotoxicity tests.

**Table 18 Human Cell Lines**

<table>
<thead>
<tr>
<th>ATCC® No.</th>
<th>Designation</th>
<th>Species</th>
<th>Cell Type and Disease State</th>
</tr>
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<tbody>
<tr>
<td>CCL-246™</td>
<td>KG-1</td>
<td><em>Homo sapiens</em></td>
<td>Macrophage; acute myelogenous leukemia</td>
</tr>
<tr>
<td>CRL-1593.2™</td>
<td>U-937</td>
<td><em>Homo sapiens</em></td>
<td>Monocyte; histiocytic lymphoma</td>
</tr>
<tr>
<td>CRL-2407™</td>
<td>NK-92</td>
<td><em>Homo sapiens</em></td>
<td>Natural killer cell; malignant non-Hodgkin’s lymphoma</td>
</tr>
<tr>
<td>TIB-71™</td>
<td>RAW 264.7</td>
<td><em>Mus musculus</em></td>
<td>Macrophage; Abelson murine leukemia virus-induced tumor</td>
</tr>
<tr>
<td>TIB-202™</td>
<td>THP-1</td>
<td><em>Homo sapiens</em></td>
<td>Monocyte; acute monocytic leukemia</td>
</tr>
</tbody>
</table>

**Table 19 Human Primary Immune Cells**

<table>
<thead>
<tr>
<th>ATCC® No.</th>
<th>Designation</th>
<th>Availability</th>
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<tbody>
<tr>
<td>ACS-7010™</td>
<td>iPSC-derived Mesenchymal Stem Cells, BYS0112</td>
<td>Coming soon</td>
</tr>
<tr>
<td>ACS-7020™</td>
<td>iPSC-derived CD34+ Cells, BXS0117</td>
<td>Available</td>
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<tr>
<td>ACS-7030™</td>
<td>iPSC-derived Monocytes, DYS0100</td>
<td>Coming soon</td>
</tr>
<tr>
<td>PCS-800-010™</td>
<td>Peripheral Blood CD14+ Monocytes</td>
<td>Available</td>
</tr>
<tr>
<td>PCS-800-011™</td>
<td>Peripheral Blood Mononuclear Cells</td>
<td>Available</td>
</tr>
<tr>
<td>PCS-800-012™</td>
<td>Bone Marrow CD34+ Cells</td>
<td>Available</td>
</tr>
<tr>
<td>PCS-800-013™</td>
<td>Bone Marrow Mononuclear Cells</td>
<td>Available</td>
</tr>
<tr>
<td>PCS-800-014™</td>
<td>Cord Blood CD34+ Cells</td>
<td>Available</td>
</tr>
<tr>
<td>PCS-800-016™</td>
<td>Peripheral Blood CD4+ Helper T Cells</td>
<td>Available</td>
</tr>
<tr>
<td>PCS-800-017™</td>
<td>Peripheral Blood CD8+ Cytotoxic T Cells</td>
<td>Available</td>
</tr>
<tr>
<td>PCS-800-018™</td>
<td>Peripheral Blood CD19+ B Cells</td>
<td>Available</td>
</tr>
<tr>
<td>PCS-800-019™</td>
<td>Peripheral Blood CD56+ Natural Killer Cells</td>
<td>Available</td>
</tr>
</tbody>
</table>

**Custom Services**

Having trouble finding exactly what you need? Your unique problems deserve custom solutions. ATCC will work with you to develop, manufacture, preserve, and store the cells and biomaterial your research requires. We offer:

- Cell and microbial biobanking
- Custom biorepository services (both cGMP and non-cGMP)
- Custom cell development and sourcing (including primary cells from certain species or donor demographics)
- Cell authentication and mycoplasma testing

Make ATCC your trusted partner for *in vitro* toxicology testing. We are available to support every step of your workflow.

Explore our full portfolio at [www.atcc.org/tox](http://www.atcc.org/tox).