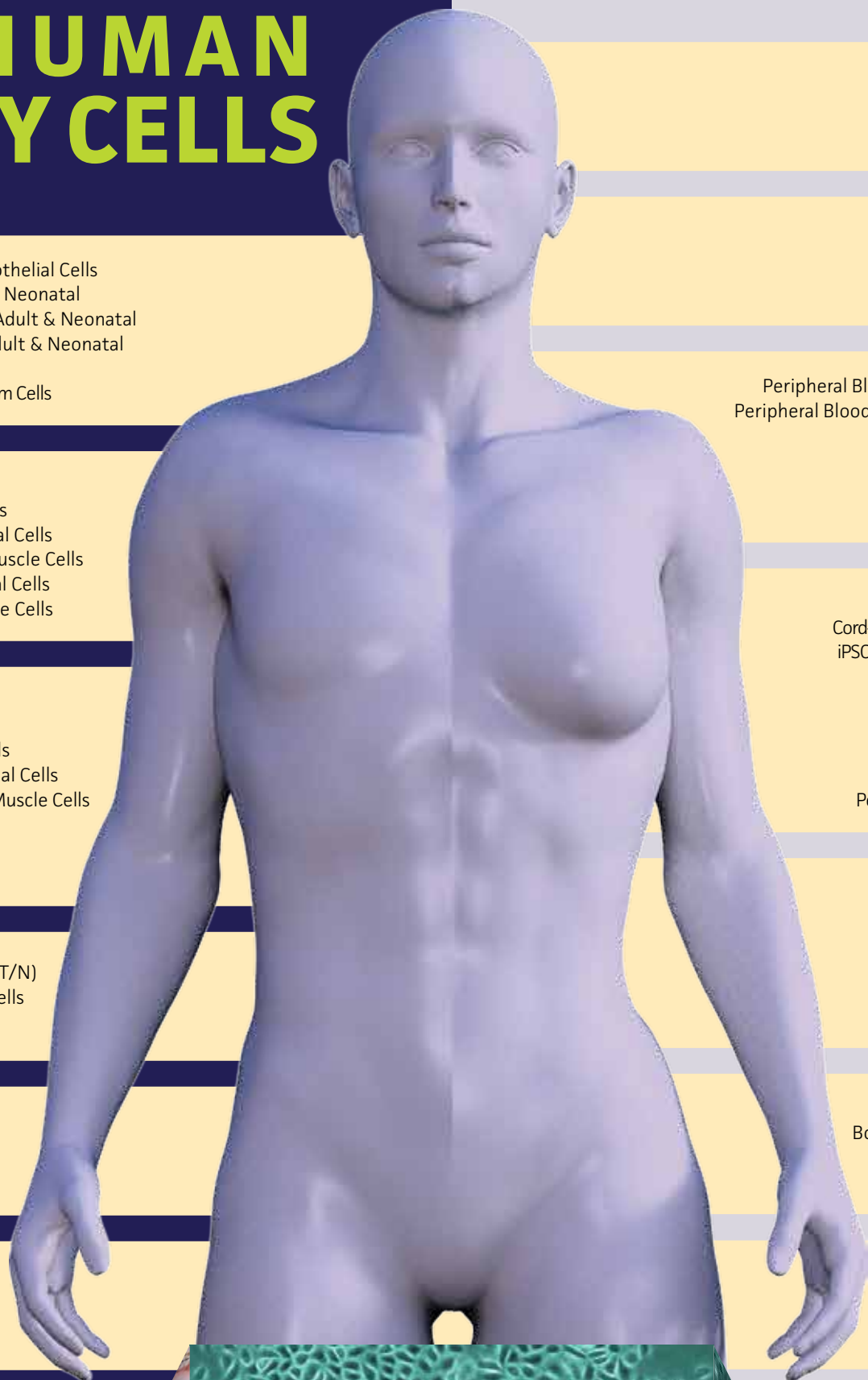


# ATCC® HUMAN PRIMARY CELLS



**Icon:** Skin  
 Dermal Microvascular Endothelial Cells  
 Dermal Fibroblast, Adult & Neonatal  
 Epidermal Keratinocytes, Adult & Neonatal  
 Epidermal Melanocytes, Adult & Neonatal  
 Pre-adipocytes  
 Adipose-derived Mesenchymal Stem Cells

**Icon:** Heart  
 Aortic Endothelial Cells  
 Aortic Smooth Muscle Cells  
 Coronary Artery Endothelial Cells  
 Coronary Artery Smooth Muscle Cells  
 Pulmonary Artery Endothelial Cells  
 Pulmonary Artery Smooth Muscle Cells

**Icon:** Lungs  
 Lung Smooth Muscle Cells  
 Lung Fibroblasts  
 Small Airway Epithelial Cells  
 Bronchial/Tracheal Epithelial Cells  
 Bronchial/Tracheal Smooth Muscle Cells  
 Lobar Bronchial Epithelial Cells  
 Disease Airway Cells  
 Primary Lobar Epithelial Cells

**Icon:** Bladder  
 Bladder Epithelial Cells (A/T/N)  
 Bladder Smooth Muscle Cells  
 Bladder Fibroblast Cells

**Icon:** Prostate  
 Prostate Epithelial Cells

**Icon:** Muscle  
 Primary Skeletal Muscle Cells

Corneal Epithelial Cells **Icon:** Eye

Gingival Fibroblasts  
 Gingival Keratinocytes **Icon:** Mouth

Peripheral Blood Mononuclear Cells (PBMC)  
 Peripheral Blood CD14+ Monocytes  
 Peripheral Blood CD4+ Cells  
 Peripheral Blood CD8+ Cells  
 Peripheral Blood CD19+ Cells  
 Peripheral Blood CD56+ Cells **Icon:** Blood cell

Cord Blood CD34+ Cells  
 Cord-derived Mesenchymal Stem Cells  
 iPSC-derived Mesenchymal Stem Cells  
 iPSC-derived CD34+ Cells  
 iPSC-derived Monocytes  
 Peripheral Blood CD4+ Helper T Cells  
 Peripheral Blood CD8+ Cytotoxic T Cells  
 Peripheral Blood CD19+ B Cells  
 Peripheral Blood CD56+ Natural Killer Cells **Icon:** Tree

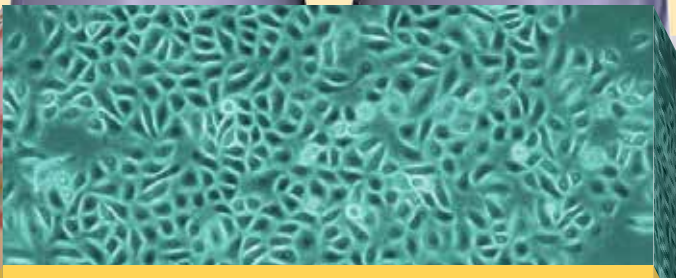
Cervical Epithelial Cells  
 Uterine Fibroblast Cells  
 Uterine Smooth Muscle Cells  
 Mammary Epithelial Cells  
 Vaginal Endometrial Cells  
 Vaginal Epithelial Cells **Icon:** Uterus

Bone Marrow CD34+ Cells  
 Bone Marrow Mononuclear Cells  
 Bone Marrow-Derived Mesenchymal Stem Cells **Icon:** Bone

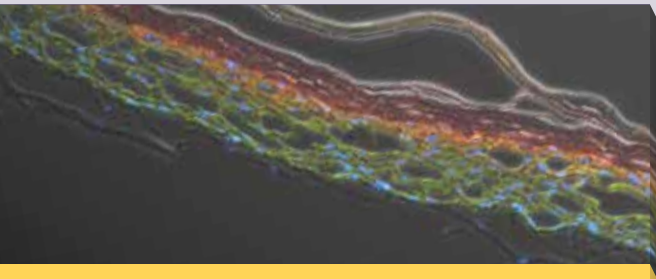
Hepatocytes: Characterized **Icon:** Liver



From *in situ*



To serve as ideal controls to *in vitro* models



To capture the *in vivo* situation

## COMPLETE PRIMARY CELL SOLUTIONS FOR ROBUST CELL GROWTH

- ATCC offers:**
- Primary cell media
  - Cell-specific growth kits
  - Dissociation reagents
  - Cryopreservation media
  - Optimized growth protocols
  - Primary Cell Culture Guide

## WHAT ARE HUMAN PRIMARY CELLS?

- Untransformed
- May display similar gene expression as cells *in situ*
- Many similar physiologic functions as *in vivo*
- Indispensable for a wide range of experiments
- Ideal to examine physiology or disease pathology
- Can reduce animal usage in preclinical experiments

## 3-D CULTURE MODELS CAPTURE THE *IN VIVO* SITUATION:

- Form functional airway epithelium
- Mucus secretion
- Cilia formation
- Form functional epidermis
- Stratified morphology
- Barrier function
- Form vascular tubules
- Von Willebrand factor & CD31 expression
- AcLDL uptake
- Form Organoids
- Microtissue structure
- Genotypically/phenotypically stable

# hTERT-IMMORTALIZED PRIMARY CELLS

combine the best of both worlds:

ATCC human telomerase reverse transcriptase (hTERT)-immortalized primary cells combine the *in vivo* nature of primary cells with the growth potential of a continuous cell line

## Pros and cons of different cell models for tissue-relevant functional studies

|  | Primary cells           | hTERT-immortalized       | Cancer cell lines |
|--|-------------------------|--------------------------|-------------------|
| <b>Mimic <i>in vivo</i> Tissue Phenotype</b> |                         |                          |                   |
| <b>Genotypic Stability</b>                   | Diploid                 | Diploid/<br>Near diploid | Aneuploid         |
| <b>Proliferative Capacity</b>                | Limited                 | Extended                 | Continuous        |
| <b>Inter-experimental Consistency</b>        | Varies by donor         | Good                     | Good              |
| <b>Serum requirement for media</b>           | Serum-free or low serum | Serum-free in some lines | Serum required    |

Epidermal Keratinocytes  
Skin Fibroblasts



Aortic Endothelial Cells  
Dermal Microvascular Endothelial Cells



Airway Cells  
Bronchial Epithelial Cells



Endometrial Fibroblasts  
Mammary Epithelial Cells



Chondrocyte Fibroblasts  
Mesenchymal Stem Cells



Renal Epithelial Cells



Barrett's Esophageal Epithelial Cells  
Pancreatic Duct Cells

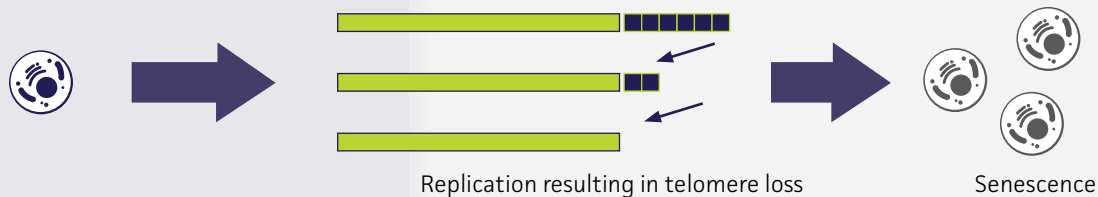


Retinal Pigmented Epithelial Cells

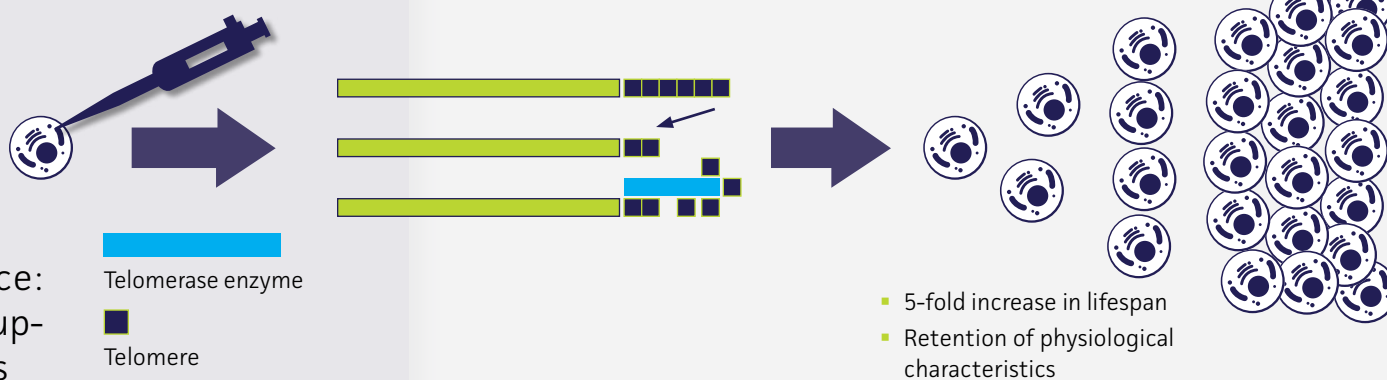


## hTERT-IMMORTALIZATION

- Primary cells are restricted to a finite number of cell divisions
- Telomeres are repeat sequences that cap chromosome ends
- This limit is due to the loss of telomeres during cell division



- Transfect target cells with the catalytic subunit of telomerase enzyme (hTERT)
- hTERT catalyzes the replacement of telomere subunits
- The hTERT-expressing cell escapes senescence



### hTERT-immortalized and normal Primary Cell Culture Guides



Learn all about:



- Growth media formulations
- Culturing conditions
- Seeding densities



- Cell counting
- Confluence



- Cryopreservation
- Subculturing protocols
- Download the guides at [www.atcc.org/guides](http://www.atcc.org/guides)

Browse ATCC's wide variety of hTERT-immortalized primary cells at [www.atcc.org/hTERT](http://www.atcc.org/hTERT)

**PHONE**  
800.638.6597  
703.365.2700

**EMAIL**  
SalesRep@atcc.org

**WEB**  
[www.atcc.org](http://www.atcc.org)