5 reasons to enhance your cell culture using a Thermo Scientific CO₂ incubator with variable oxygen control
We use the Heracell tri-gas incubator because the integrity of the cells is better, they develop better, and they are healthier.

— Neurobiology researcher, clinical research institute
Discovery thrives in a culture of confidence

Thermo Scientific Variable Oxygen Control CO₂ incubators are uniquely designed to optimize growth of mammalian cells in an environment that closely mimics *in vivo* conditions.

For many decades, animal cells have been cultured in air supplemented with carbon dioxide. But new technologies and applications for cell therapies require conditions that better mimic those *in vivo*.

Inside the body, oxygen concentrations range from 1-14%, rather than the 20-21% found in the atmosphere. Cells cultured in low oxygen (hypoxia) grow faster, live longer, and show lower stress. Our variable oxygen control (or “tri-gas”) incubators will generate hypoxic conditions to help your cells grow faster and healthier.

Maximize your productivity by surrounding your important cells in an environment you can trust.
Increased biological relevance

The air we breathe is 21% oxygen but that is different inside our bodies. Oxygen levels in tissues can be as low as 1–2%. Culturing your cells at lower oxygen concentration will better simulate physiological conditions, resulting in cell behaviors that are more predictive of an in vivo environment.

<table>
<thead>
<tr>
<th>Oxygen Levels in Human Tissues</th>
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<tbody>
<tr>
<td>Lungs</td>
<td>14%</td>
</tr>
<tr>
<td>Arteries</td>
<td>12%</td>
</tr>
<tr>
<td>Liver, heart, kidneys</td>
<td>4–12%</td>
</tr>
<tr>
<td>Eyes</td>
<td>1–5%</td>
</tr>
<tr>
<td>Brain</td>
<td>0.5–7%</td>
</tr>
<tr>
<td>Bone marrow</td>
<td>0–4%</td>
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</tbody>
</table>

APPLICATIONS:
Cell biology
Basic and applied research and production
Pharmaceutical testing

Greater cell number and longer life

Research shows that experiments using primary cells better mimic how cells will react in vivo. Many primary cell types grow faster and live longer when cultured under hypoxic conditions.

APPLICATIONS:
Vaccine and biopharma production
Basic and applied research
3 Reduced differentiation and stress responses

Oxygen concentration is an important determiner of cell fate and modulates expression of stress markers. Human stem cells grown at 20% oxygen show an increase in oxidative stress and DNA damage. Shifting the cells to a lower oxygen concentration that mimics physiological levels increases lifespan while limiting oxidative damage, genetic instability, and telomere shortening.


APPLICATIONS:
- Developmental biology
- Neurology
- Stem cell research
- Regenerative medicine
- Physiology

“...Our lab mandates this [5% oxygen in the Heracell tri-gas incubator] in order to mimic conditions in the body, so that cells are as close to those conditions as possible and nothing is different. All of the signals for proper epigenetics are there.”

– Stem cell researcher at biomedical research institute
4
Better simulation of tumor microenvironments

In a solid tumor there is a decreasing oxygen gradient from the outer edge of the tumor, where cells contact oxygenated capillary blood, toward the center. In the tumor’s center, very low oxygen results in necrotic (dying) cells. This area of necrosis is associated with increased resistance to chemotherapy and radiation, and with continued tumor progression.

APPLICATIONS:
- Cancer research
- Drug discovery
- Cancer treatment

5
Variable oxygen control provides optimal growth

We introduced the tri-gas incubator in 1979, only two years after Packer and Fuehr (Nature, 1977) proved that cells cultured in low oxygen had longer lifespans. Our decades of engineering innovative variable oxygen control technology provide you with:

- Exceptional interactive control and precise control technology
- Proven contamination prevention solutions providing 24/7 sample protection (in-chamber HEPA filtration, automated high temperature decontamination)
- Choice of oxygen control ranges 1-21% or 5-90% for application flexibility
- Water jacket or direct heat temperature management
- Advanced oxygen sensor technology for reliable and accurate control
- Innovative segmented inner doors to minimize disturbance of culturing conditions with reduced operating costs

APPLICATIONS:
- All areas of cell biology
- Basic and applied research and production

“...Faculty member researching Hypoxia-Inducible Factor-1..."
Discovery thrives in a culture of confidence.

Put the power of variable oxygen control incubators to work for you today with our special Heracell dual stack packages.

- Choice of mixed package with one or two tri-gas incubators including roller base
- Choice of stainless steel or 100% pure copper interiors
- O₂ control of 1-21% with advanced zirconium oxide sensor
- Gas-tight inner doors to minimize gas losses during routine access

Special! Thermo Scientific Heracell 150i dual stack packages including roller base and gas-tight screens for 1-21% O₂ models.

<table>
<thead>
<tr>
<th>Promo Package</th>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stainless Steel O₂ Dual Stack</td>
<td>11-687-200</td>
<td>Stack of two Heracell 150i CO₂ incubators with stainless steel interior, O₂ control range 1-21%, with three-door inner glass door assembly, TC sensor, roller base, 120V</td>
</tr>
<tr>
<td>100% Pure Copper O₂ Dual Stack</td>
<td>11-687-201</td>
<td>Stack of two Heracell 150i CO₂ incubators with 100% pure copper interior, O₂ control range 1-21%, with three-door inner glass door assembly, TC sensor, roller base 120V</td>
</tr>
<tr>
<td>Stainless Steel CO₂/O₂ Dual Stack</td>
<td>11-687-200PR</td>
<td>Stack of one Heracell 150i CO₂ incubator with stainless steel interior and one Heracell 150i CO₂ incubator with O₂ control range 1-21%, with three-door inner glass door assembly, TC sensor, roller base 120V</td>
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Special package, part numbers are available until December 31, 2013. Valid in North America only. Void where prohibited. Not valid with any other offer, contract or agreement.

www.thermoscientific.com/co2incubators