

A simple choice

Essential 8 Media





Your stem cells thrive with the essentials



Gibco™ Essential 8™ Medium is a feeder-free, xeno-free medium originally developed in the laboratory of stem cell research pioneer James Thomson. Essential 8 Medium contains only the eight essential components needed to grow and expand pluripotent stem cells (PSCs).

Proven to maintain pluripotency in multiple induced pluripotent stem cell (iPSC) lines, Essential 8 Medium has been shown to support iPSC growth for greater than 50 passages with no signs of karyotypic abnormalities and maintain the ability of iPSCs to differentiate into all three germ line lineages.

“Essential 8 Medium does exactly what you need it to do. And because it is so simple, it can be made in a more controlled way.”

— Emile Nuwaysir, PhD, Cellular Dynamics International

Why 8?

Many feeder-free stem cell media contain 20 or more components in their formulations. While these media may adequately grow and maintain PSCs, they also contain many variables and commonly exhibit lot-to-lot inconsistencies.

By removing highly undefined proteins (such as BSA) and other components, and including only the ingredients necessary for PSC culture, Essential 8 Medium helps minimize variability in culture. Additionally, Essential 8 Medium is manufactured under cGMP conditions, a further safeguard against lot-to-lot variability that minimizes the risk of variable outcomes and unintended cell differentiation.

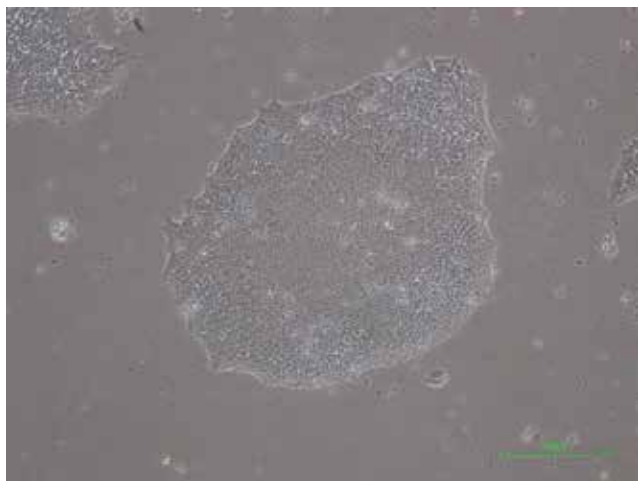


Figure 1. iPSC morphology—iPSCs cultured in Essential 8 Medium on vitronectin at passage 4.

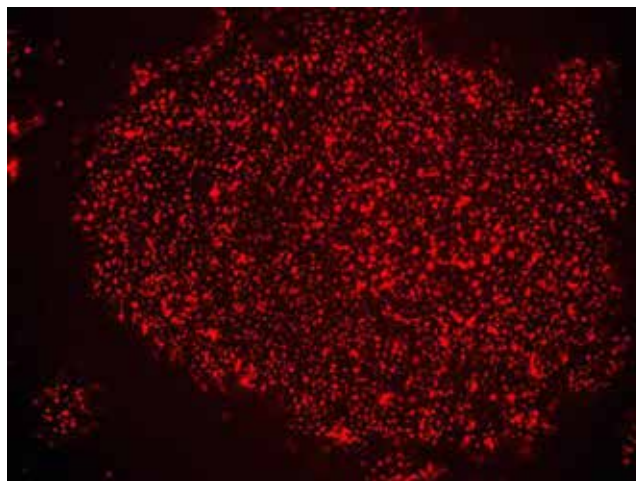


Figure 2. Surface marker staining—Tra-1-60 staining of iPSCs cultured in Essential 8 Medium on vitronectin-coated plates at passage 13.

Where would you like to gain control?

Choose the Essential medium that's right for you.



PSC maintenance and expansion—
Essential 8 Medium

Our most defined and consistent feeder-free medium for iPSCs

Determine what goes in and what stays out of your PSC cultures with a medium that contains only the 8 essential ingredients required to consistently grow and maintain PSCs, while minimizing variability.

- **Consistent**—reduced variability compared to conventional feeder-free culture media.
- **Cost effective**—economical and scalable PSC culture compared to other feeder-free culture media.
- **Robust**—reliable and consistent cultures with a xeno-free, cGMP-defined medium.



Embryoid body formation and
differentiation—Gibco™ Essential 6™ Medium

Enables more efficient embryoid body (EB) differentiation

When used in conjunction with Essential 8 Medium, Essential 6 Medium supports robust EB formation.

- **Flexibility**—provides a flexible format where the levels of transforming growth factor beta (TGFB) and basic fibroblast growth factor (FGF2) can be adjusted to match a given application.
- **Increased reprogramming efficiency**—does not contain TGFB, which has a negative effect on reprogramming efficiency.
- **Supports embryoid body formation**—does not contain FGF2, which inhibits embryoid body formation and differentiation.

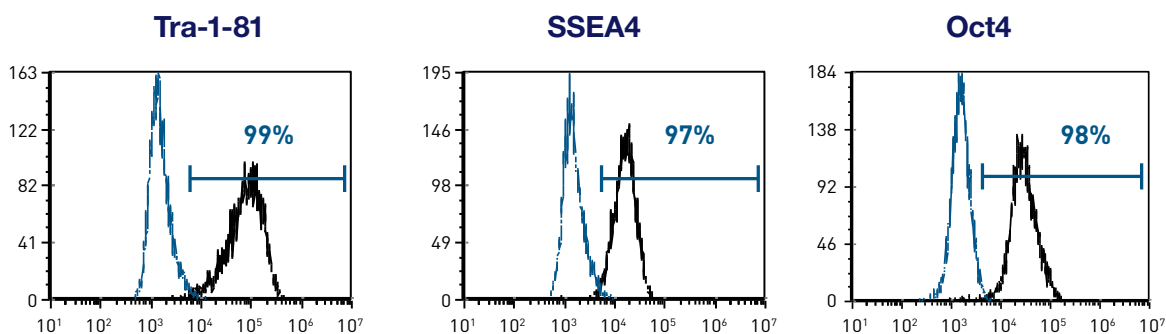


Figure 3. iPSCs grown in Essential 8 Medium maintain pluripotency and retain normal karyotype. CDI iPSC line, shown here at passage 18, were grown in Essential 8 Medium on vitronectin-coated plates.

“My experience with the Essential 6 Medium is very positive. iPSC colonies are bigger with more defined colony borders compared to our standard induction.”

— Timo Otonkoski, Biomedicum Stem Cell Centre (BSCC), Finland



Stressful events—Essential 8 Medium + Gibco™ RevitaCell™ Supplement

Control the level of stress on your cells

Via the combination of Essential 8 Medium and RevitaCell Supplement, nurture your cells through difficult, stressful transitions, including single cell passaging and gene editing.

- **Minimize the impact of stress**—RevitaCell Supplement supports cells in stressful applications through a more specific Rho-associated protein kinase (ROCK) inhibitor.
- **Nonaddictive**—shown to have a nonaddictive impact on downstream cell utility, unlike other ROCK inhibitors.
- **Expanded applications**—enables use of Essential 8 Medium in applications where cells need additional support.



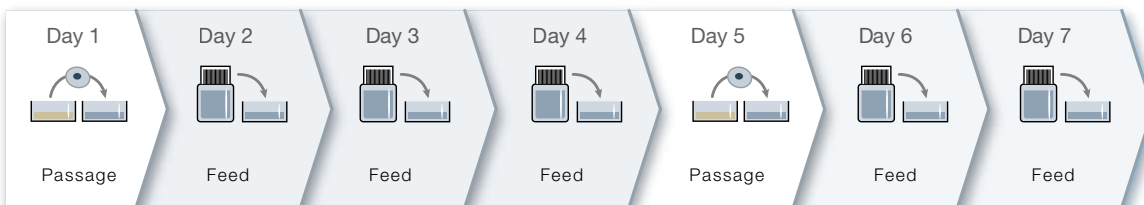
Flexible feeding schedule—Gibco™ Essential 8™ Flex Medium

Manage your PSC culture schedule and eliminate daily feeding

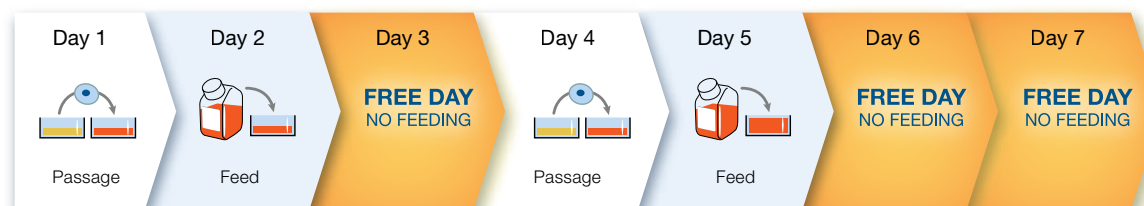
Essential 8 Flex Medium is formulated to extend the activity of key heat-sensitive components found in PSC medium, including FGF2, to enable a truly weekend-free culture feeding schedule.

- **Flexible feeding schedule**—Maintain pluripotency over a full 2-day period without feeding cells.
- **Easy to transition**—same setup, applications and protocol as the original Essential 8 Medium formulation, but without the daily feeding.
- **Proven**—based on the original Essential 8 Medium formulation, maintains pluripotency and normal karyotypes in long-term culture.

The old way: Feed your cells every day, 7 days a week



The Flex way: Eliminate daily feeding



For Research Use Only. Not for use in diagnostic procedures.

Figure 4. Culture schedule comparison. Unlike other feeder-free media, Essential 8 Flex Medium eliminates the need to manage cultures daily, enabling a truly weekend-free schedule for expansion and maintenance of PSCs.

Applications: a closer look

Flexible feeding schedule with healthy cells and robust differentiation potential

Essential 8 Flex Medium

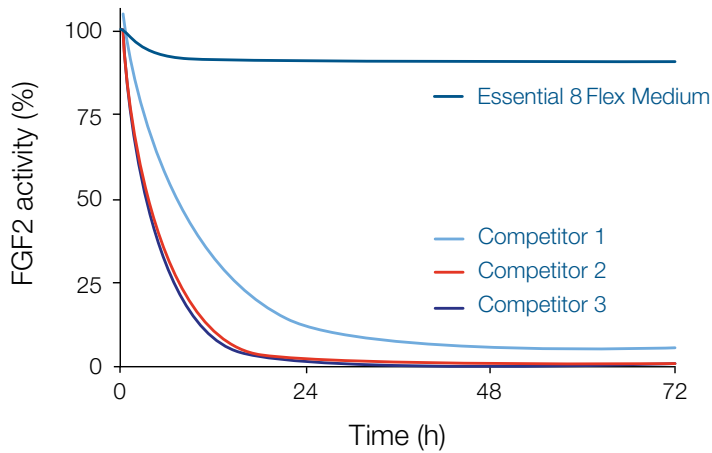


Figure 5. FGF2 activity over time in PSC culture medium. Unlike other feeder-free PSC culture media, Essential 8 Flex Medium has been optimized to extend the activity of unstable components such as FGF2. Extended activity allows for routine culture without the daily feeding.

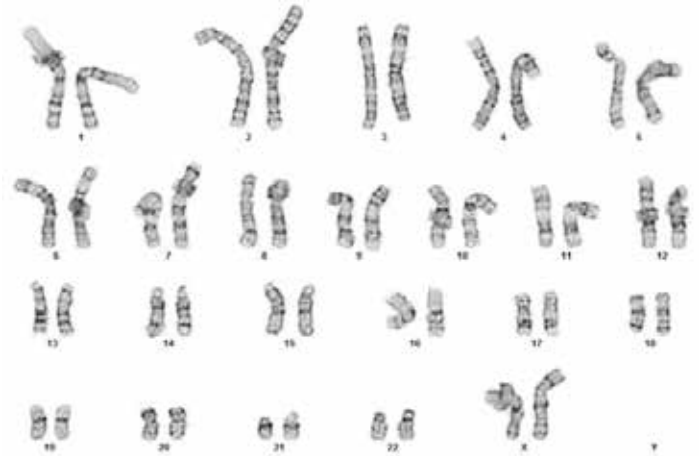


Figure 6. Long-term stability of cells cultured in Essential 8 Flex Medium. Healthy karyotypes have been observed after long-term culture of PSCs in Essential 8 Flex Medium.

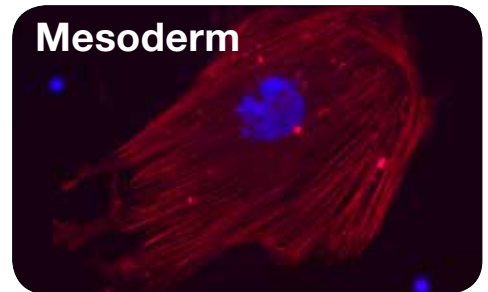
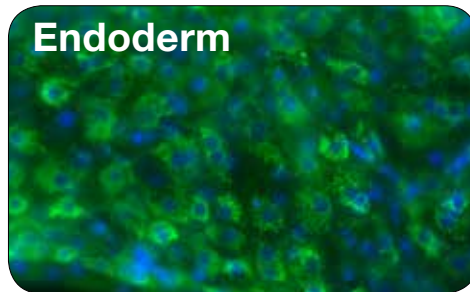
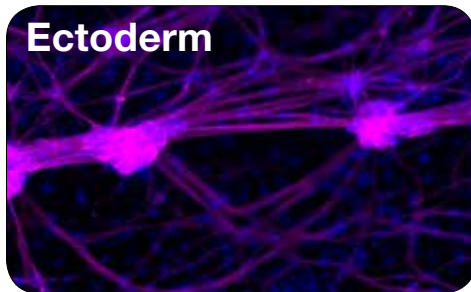


Figure 7. Confirmation of tri-lineage differentiation potential in Essential 8 Flex Medium. The potential for cells from Essential 8 Flex Medium cultures to differentiate into cells of ectoderm, mesoderm and endoderm lineages is unaffected by long-term culture in Essential 8 Flex Medium. This has been confirmed using both spontaneous differentiation from embryoid bodies and directed differentiation to neural stem cells, cardiomyocytes and definitive endoderm cells.

Nurture cells through stressful events such as single cell passaging

Essential 8 Medium + RevitaCell Supplement

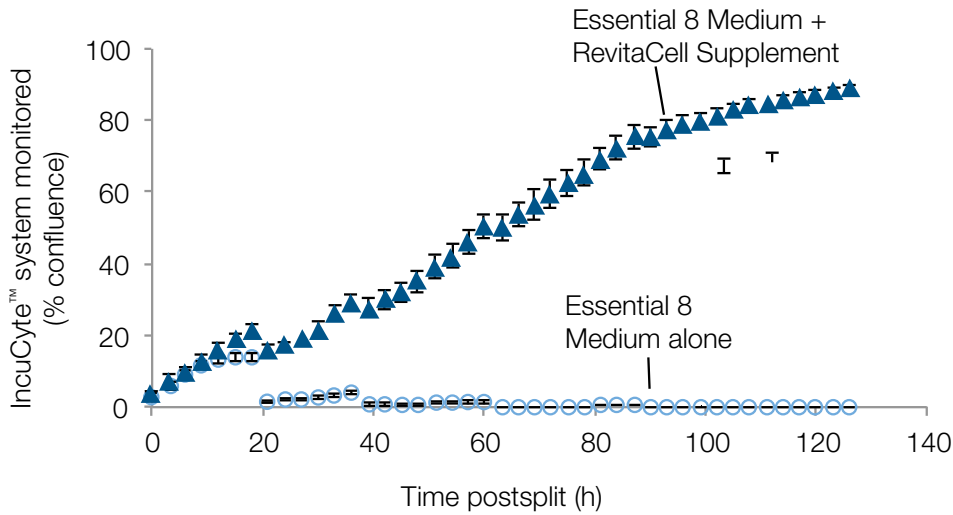


Figure 8. Single cell passaging using RevitaCell Supplement with Essential 8 Medium. iPSCs generated using episomal vectors were passaged using Gibco™ TrypLE™ Select Enzyme and seeded at a density of 25,000 viable cells/cm² onto culture plates coated with truncated recombinant human vitronectin, in Essential 8 Medium with 1X RevitaCell Supplement. Following a 24-hour recovery, iPSCs were fed with Essential 8 Medium alone for the remainder of their time in culture.

Supporting embryoid body formation for downstream differentiation

Essential 6 Medium

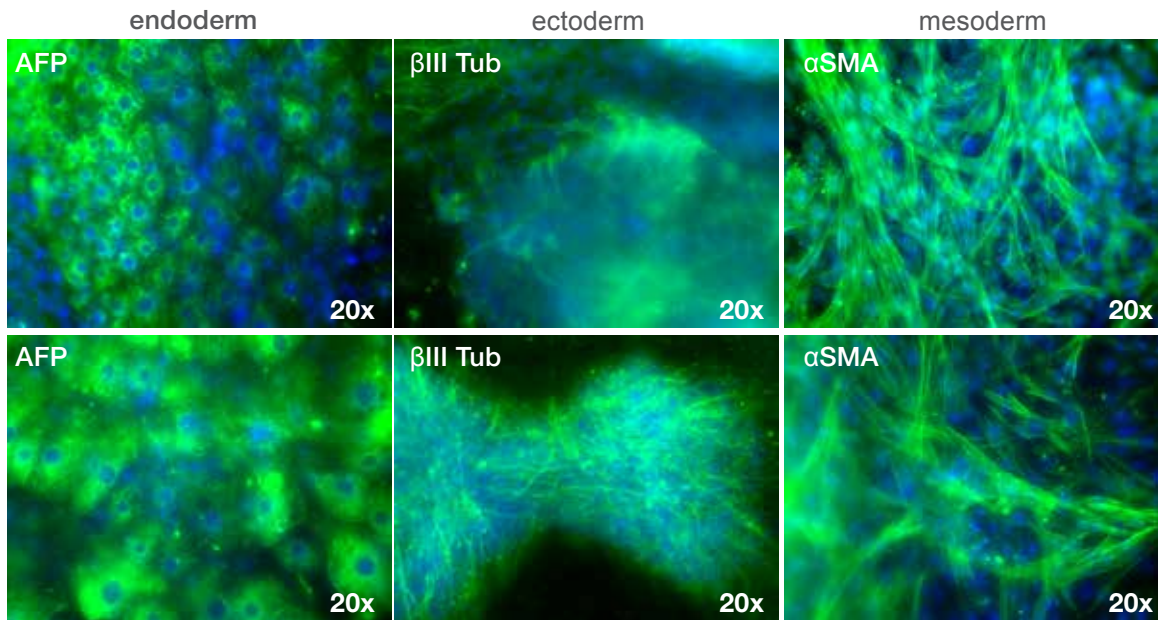


Figure 9. Differentiation potential of PSCs after embryoid body formation using Essential 6 Medium. iPSC clones demonstrate differentiation into cell types from all three germ layers (endoderm, ectoderm and mesoderm) after 12 passages. PSCs were differentiated in Essential 6 Medium on **(top)** vitronectin or **(bottom)** Geltrex matrix.

Recommended matrices

Gibco™ Vitronectin (VTN-N) Recombinant Human Protein, Truncated (Cat. No. A14700) provides a defined surface for feeder-free culture of human PSCs. As demonstrated in the James Thomson lab, the VTN-N variant of vitronectin supports human pluripotent stem cell attachment and survival better than wild type vitronectin when used in conjunction with Essential 8 Medium.

Gibco™ Geltrex™ LDEV-Free, hESC-Qualified, Reduced Growth Factor Basement Membrane Matrix (Cat. No. A1413301) is routinely used for attachment and maintenance of human embryonic stem cells to help ensure growth and pluripotency.

Ordering information

Application	Product	Cat. No.
PSC maintenance and expansion	Essential 8 Medium	A1517001
	Essential 8 Flex Medium	A2858501
Embryoid body formation and differentiation	Essential 6 Medium	A1516401
Stressful events	Essential 8 Medium	A1517001
	RevitaCell Supplement (100X)	A2644501
Flexible feeding schedule	Essential 8 Flex Medium	A2858501

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