TAKE CHARGE OF YOUR CELL QUALITY

Using eTeSR™ and mTeSR™ Plus to Support Your Workflow Needs

Maintaining high-quality human pluripotent stem cells (hPSCs) is critical for success in downstream research. At STEMCELL Technologies, our scientists have long recommended routinely passaging hPSCs as aggregates, as this method allows for the long-term expansion of many different cell lines while maintaining an expected karyotype. Existing TeSR™ media, including mTeSR™ Plus, were developed using aggregate passaging methods.

In some cases, researchers may prefer single-cell passaging for obtaining higher-density cultures, or for compatibility with single-cell applications. For these researchers, we developed eTeSR™, a novel hPSC maintenance medium formulated specifically to maintain cell quality when passaging and maintaining hPSCs as single cells. With eTeSR™ and mTeSR™ Plus, you can take charge of your cell quality in every step of your workflow—regardless of your passaging method.

mTeSR™ Plus

cGMP, Stabilized Feeder-Free Maintenance Medium for hPSCs

mTeSR™ Plus (Catalog #100-0276) is based on the formula of mTeSR™1, the most published feeder-free hPSC maintenance medium[1-4], and supports high-quality maintenance and expansion of hPSCs.

Aggregate-based passaging of hPSCs in mTeSR™ Plus enables the long-term expansion of cell lines while retaining a typical karyotype, without the need for Rho-kinase inhibitor. As variation between cell lines is still to be expected, standardized quality control measures can help limit variability and ensure relevant, reproducible findings. Cell quality can be assessed regularly through genetic analysis and functional assays (e.g. karyotyping, or using the hPSC Genetic Analysis Kit; Catalog #07550 or STEMdiff™ Trilineage Differentiation Kit; Catalog #05230).

Why Use mTeSR™ Plus?

- Enjoy weekend-free feeding while supporting cell quality, with improved buffering and stabilization of key components
- Achieve superior culture morphology and cell growth characteristics in your aggregate-based cultures
- Complete your workflow with compatible gene editing and differentiation protocols
- Ensure cell safety with a viral-safe medium manufactured under cGMPs

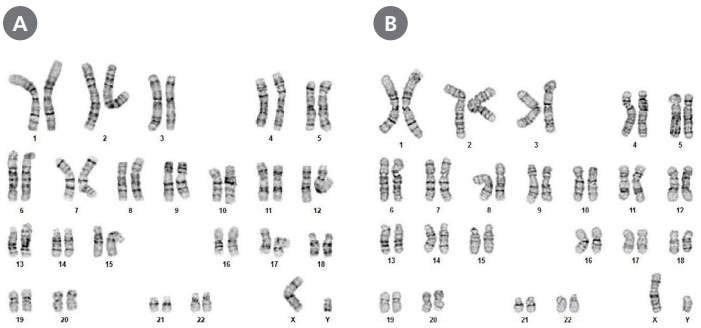

Figure 1. hPSCs Cultured in mTeSR™ Plus with Restricted Feeding Maintain a Typical Karyotype

Karyograms of (A) human ES (H1) and (B) iPS (WLS-1C) cells cultured in mTeSR™ Plus for 30 passages show a typical karyotype is retained.

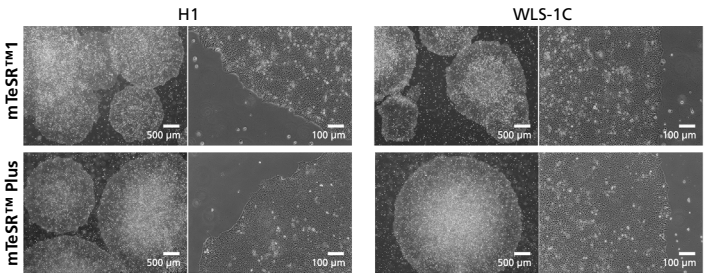

Figure 2. Normal Human ES and iPS Cell and Colony Morphology Is Observed in mTeSR™ Plus Cultures Passaged As Aggregates

Images depict undifferentiated human ES (H1) and iPS (WLS-1C) cells cultured on Corning® Matrigel® matrix in mTeSR™1 with daily feeds or in mTeSR™ Plus with restricted feeds. Cells retain the prominent nucleoli and high nuclear-to-cytoplasmic ratio characteristic of this cell type after 10 passages. Densely packed cells and multi-layering are prominent when cells are ready to be passaged.

Learn more at www.stemcell.com/mTeSRPlus

Single-cell passaging of hPSCs is becoming more widely adopted for routine maintenance as it allows for simpler workflows, less technical training, and compatibility with several applications. In spite of these advantages, long-term single-cell passaging has been linked to increased genetic instability in hPSC cultures, and few labs have rigorous quality control measures in place to assess the quality of these hPSCs. eTeSR™ enables researchers to perform single-cell passaging of hPSCs while increasing cell yields and maintaining genetic stability.

eTeSR™

Enhanced Maintenance Medium Optimized for Single-Cell Passaging

eTeSR™ (Catalogue #100-1215) has been developed to reduce the cellular stress associated with single-cell passaging and can be used for routine hPSC maintenance or application-specific single-cell culture. Built upon previous TeSR™ formulations[1-4] and developed to support shorter passaging schedules and higher culture densities, eTeSR™ addresses the increased metabolic demand associated with single-cell passaging.

With stabilization of key components (including FGF2), improved buffering capacity, and optimized metabolites, eTeSR™ can produce high-quality hPSCs with improved genetic stability compared to hPSCs maintained in media optimized for aggregate passaging.

Why Use eTeSR™?

- Increase cell yields while reducing the stress associated with single-cell passaging or high-density cultures
- Complete your workflow with compatible gene editing, cloning, differentiation, and cryopreservation protocols
- Eliminate spontaneous differentiation
- Maintain high cell quality and performance with both daily and restricted feeding schedules

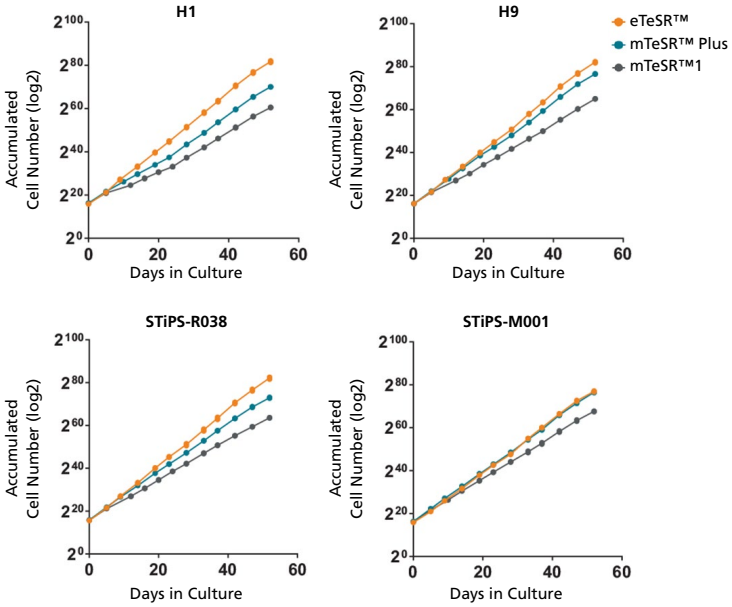

Figure 3. hPSCs Cultured As Single Cells Show Greater Expansion in eTeSR™

Four hPSC lines were single-cell passaged using TrypLE™ and maintained for 11 passages in either mTeSR™1, mTeSR™ Plus, or eTeSR™ on Corning® Matrigel®-coated plates. Cultures were maintained using a 4-day and subsequent 5-day passaging schedule with restricted feeding for mTeSR™ Plus and eTeSR™ and with daily feeding for mTeSR™1. Accumulated cell numbers were calculated by dividing the number of cells at the end of each passage by the number of cells seeded at passage.

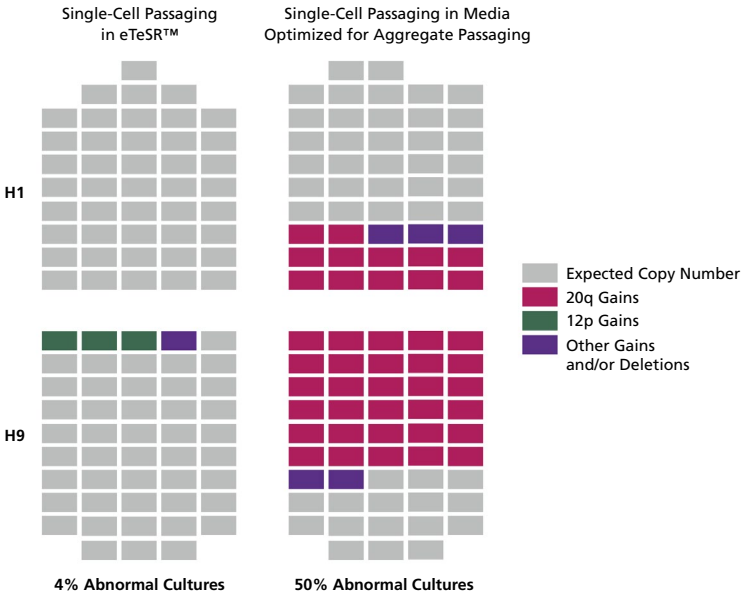

Figure 4. hPSC Cultures Demonstrate Improved Genetic Stability When Maintained Long Term in eTeSR™ Using Single-Cell Passaging

Data generated from long-term single-cell passaging in different media. 24 individual hPSC clones from H1 and H9 were passaged using an automated system for 20 weeks. Clones were screened for recurrent abnormalities using the hPSC Genetic Analysis Kit (Catalog #07550), then confirmed using FISH (20q and 12p).

Learn more at www.stemcell.com/eTeSR

Reference: 1. Chen G et al. (2011) Nat Methods 8(5): 424–9. 2. Ludwig TE et al. (2006) Nat Methods 3(8): 637–46. 3. Ludwig TE et al. (2006) Nat Biotechnol 24(2): 185–7. 4. Beers J et al. (2012) Nat Protoc 7(11): 2029–40.