cellgro® by Mediatech, Inc.

Stem Cells, Regenerative Medicine-Growth Optimization Needed

Stem cells from umbilical cords, bone marrow or embryos are cultured *in vitro* to produce specialized, differentiated cells such as muscle, heart or nerve cells. These adaptable stems cells and other primary cells such as keratinocytes, fibroblasts, osteoblasts are used in regenerative medicine. They are also used for tissue transplantation, medical therapies to treat diseases like leukemia, and in basic research.

Culturing Stem Cells Can Be Problematic

Stem and primary cells are not usually easy cells to maintain or grow. They are generally grown in medium containing fetal bovine serum (FBS), bovine serum albumin (BSA), human serum albumin (HSA), or knock-out serum replacement (KSR).

Some scientists avoid animal or human-derived components in cell culture media due to issues such as:

- Variability with animal-derived serums like FBS, HSA and KSR
- Increased risk of infection of the stem cell culture, creating regulatory issues, particularly when cells are grown for patient transplants
- Altered stem cell morphology, growth and apoptosis
- Difficulty keeping stem cells in undifferentiated state

The Solution to Problems with Stem Cell Culture

Stem cell research on regenerative medicine and transplantation can be optimized by adding these animal-free products from InVitria to your media:

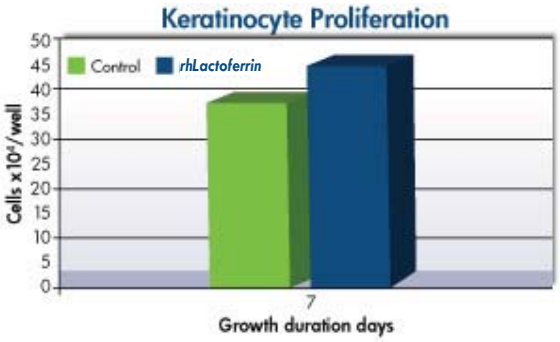
- *rHSA, or cellgro® rhAlbumin {Recombinant human serum albumin}*
- *rhLF or cellgro® rhLactoferrin {Recombinant human lactoferrin}*
- *hTF or cellgro® rhTransferrin {Recombinant human transferrin}*

cellgro®'s InVitria products focus on maximizing stem cells, regenerative medicine and transplantation by improving performance and reducing the regulatory and safety risks. These replace animal-derived cell culture additives with chemically-defined and animal-free alternatives from plant systems, which lead to enhanced performance for optimal stem cell culturing.

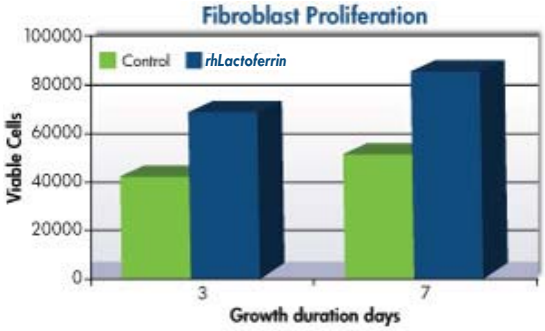
How These New Cell Culture Additives Improve Stem Cell Culture

Advantages to using rhAlbumin, rhLactoferrin and rhTransferrin instead of animal-derived components in stem cell culture medium include:

- Elimination of animal-derived additives-safe
- Regulatory friendly
- Effective in enhancing stem cell growth inembryonic, mesenchymal, neural, cardiac, liver, kidney, osteoblast, keratinocyte and fibroblast stem cell lines



Normal human skin keratinocytes were grown in EpiLife-based medium with human keratinocyte supplements (HKGS) (CAScade) and without transferrin, either alone (control)(green) or supplemented with rhLactorferrin (blue). Improved cell growth was observed in the medium supplemented with rhLactoferrin at 100 mg/L



Normal human skin fibroblasts were grown in fibroblast growth medium either alone (control)(green) or supplemented with rhLactoferrin (blue). Significant cell growth was observed in the medium supplemented with rhLactoferrin at 100 mg/L

- Maintains stem cells in an undifferentiated state
- Eliminates coating of culture plates for adherent cell lines
- Provides well-defined and consistent stem cell medium

cellgro® rhAlbumin outperforms BSA, HSA and other sources of recombinant albumin in promoting stem cell growth. It is more consistent than other animal-free products, performing similarly to FBS.

cellgro® rhLactoferrin is a multi-functional growth factor and protein that provides unique benefits for stem cell research and regenerative medicine applications.

cellgro® rhTransferrin is a recombinant human transferrin made in a plant system, so that it is an animal-free source of iron for cell cultures.