

Cambridge International Stem Cell Symposium

19th - 21st September 2018

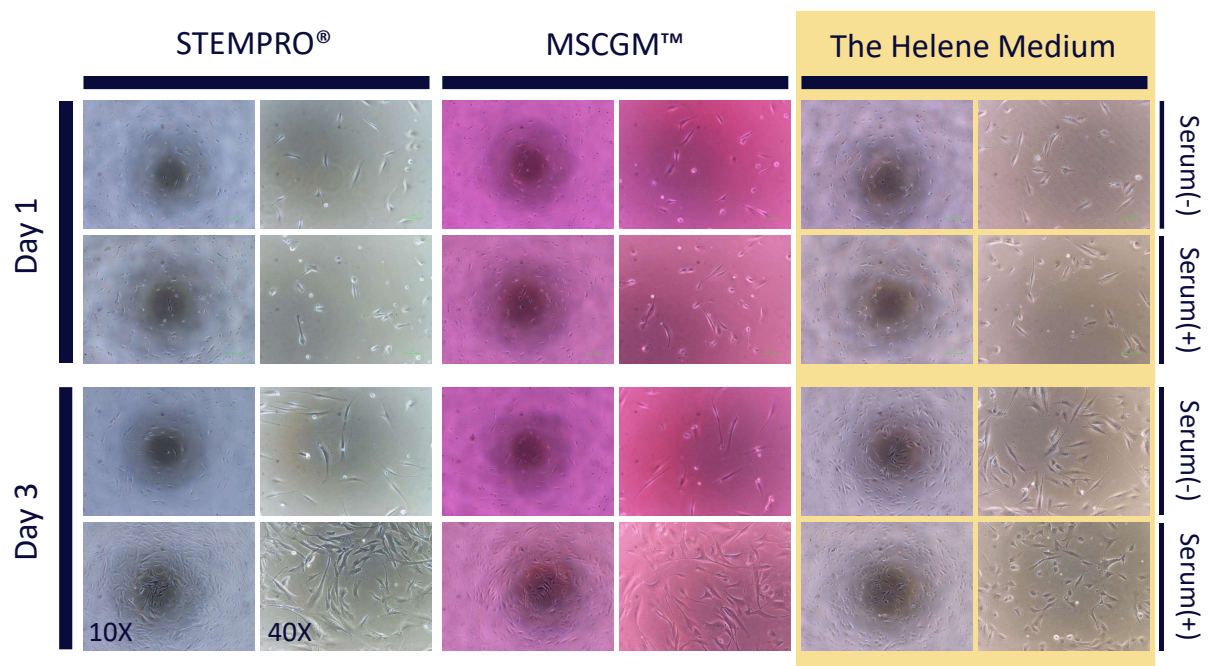
206 The "Helene Medium": specialized stem cell culture medium

Yang CF, Saito M, Shirakawa K, Matsuoka T

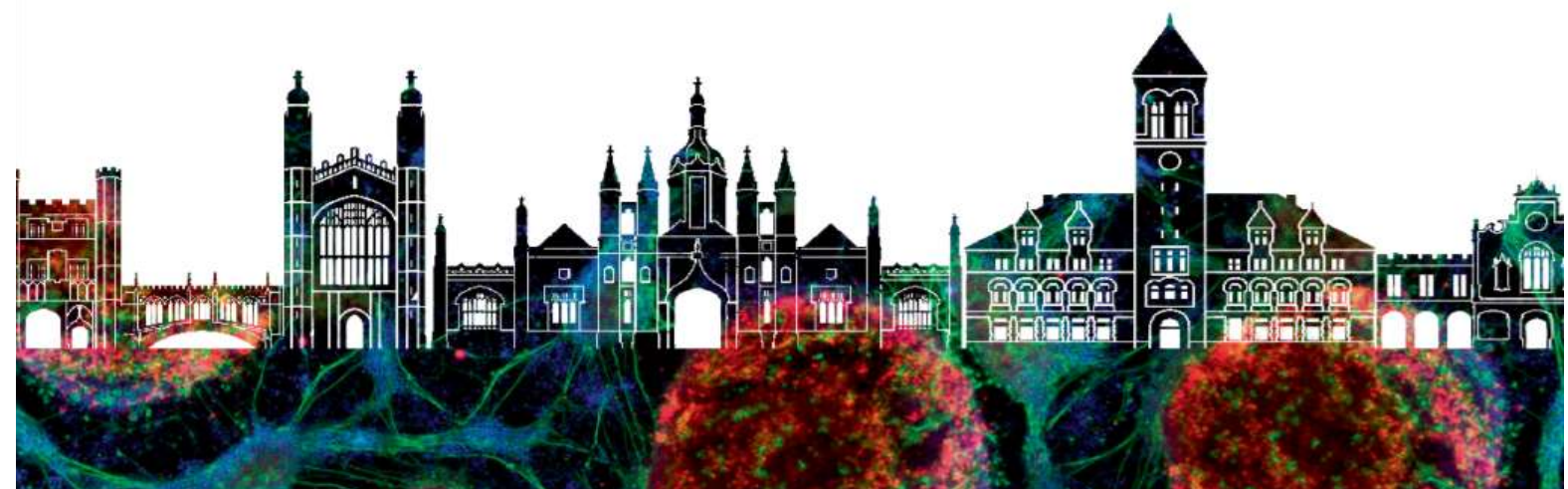
STEMCELL Co. Ltd, Japan

Keywords: cell culture, transplantation

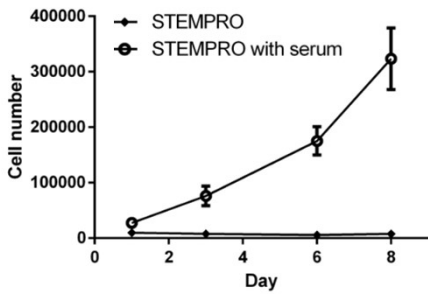
The stem cell culture requires many different conditions from normal or cancer cell culture, such as serum concentration, culture methods, and most of all, the culture medium. In our clinic in Japan, we provide stem cell treatments to our patients. We need more efficient and safer stem cell culture; thus, we have developed a specialized stem cell culture medium for primary stem cell culture. The "Helene Medium" is designed specially for stem cell growth, with better growth rate, stable cell growth, less chance of differentiation. We grow the stem cells in our medium and two other commercial mediums, examine the growth rate, cell morphology and passage number to evaluate the cell quality. Besides, serum usage in stem cell culture might lead to cell differentiation. We also test the different concentrations and types of serum. Stem cells could grow easily in Helene Medium but other cell types such as fibroblast cells, are difficult to grow. In our research, we have found that compared with other commercial mediums, stem cells cultured by our medium grow faster and with more stable cell morphology. Also, the expression of clusters of differentiation (CD) shows that stem cells are able to keep their potency during cell culture.



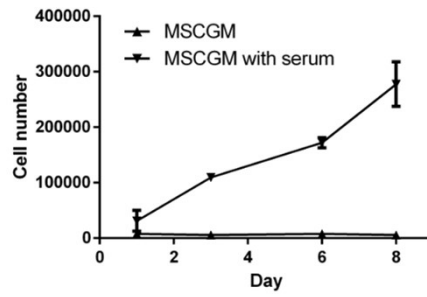
No significant difference is observed in either cases on Day 1. Whereas on Day 3, Helene Medium outstands the commercial mediums in terms of better cell growth, more stable morphology under both serum-free and serum-containing condition.



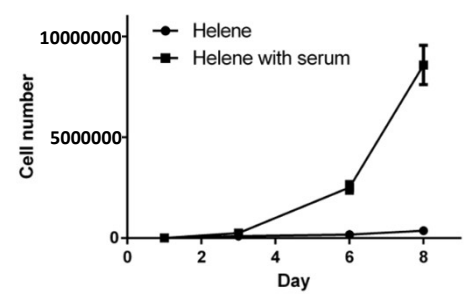
Growth rate of cell cultured with STEMPRO®



Growth rate of cell cultured with MSCGM™

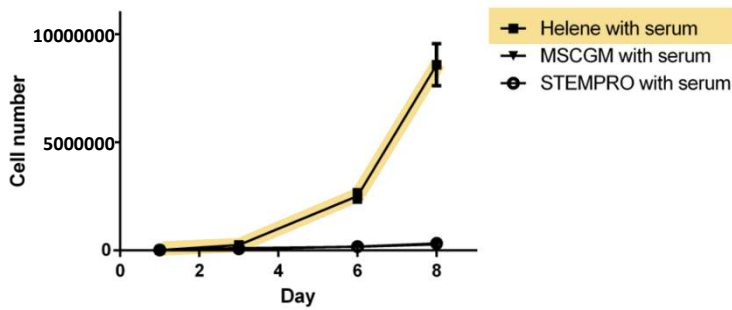


Growth rate of cell cultured with Helene Medium

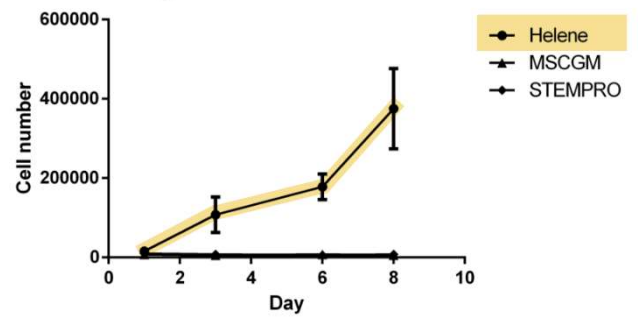


Stem cells cultured without serum grows slower than those with serum.

Cell growth rates with serum

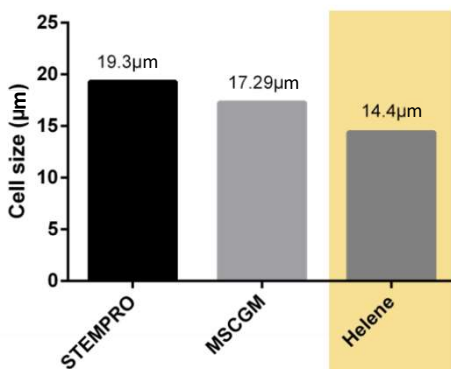


Cell growth rates without serum



Yet in either cases, number of cells cultured in Helene medium exceeded that in the two commercial medium, showing that cells in Helene exhibits better growth rate.

Cell size in different mediums (with 10% serum)



Size of stem cells is considered as one of the validations for differentiation tendency, as stem cells are smaller than its differentiation product, fibroblasts(10-15 µm). From the result (left), only stem cells cultured within Helene medium demonstrates stem cells' character of smallness.



干细胞培养专用培养基：Helene培养基

206 The "Helene Medium": specialized stem cell culture medium

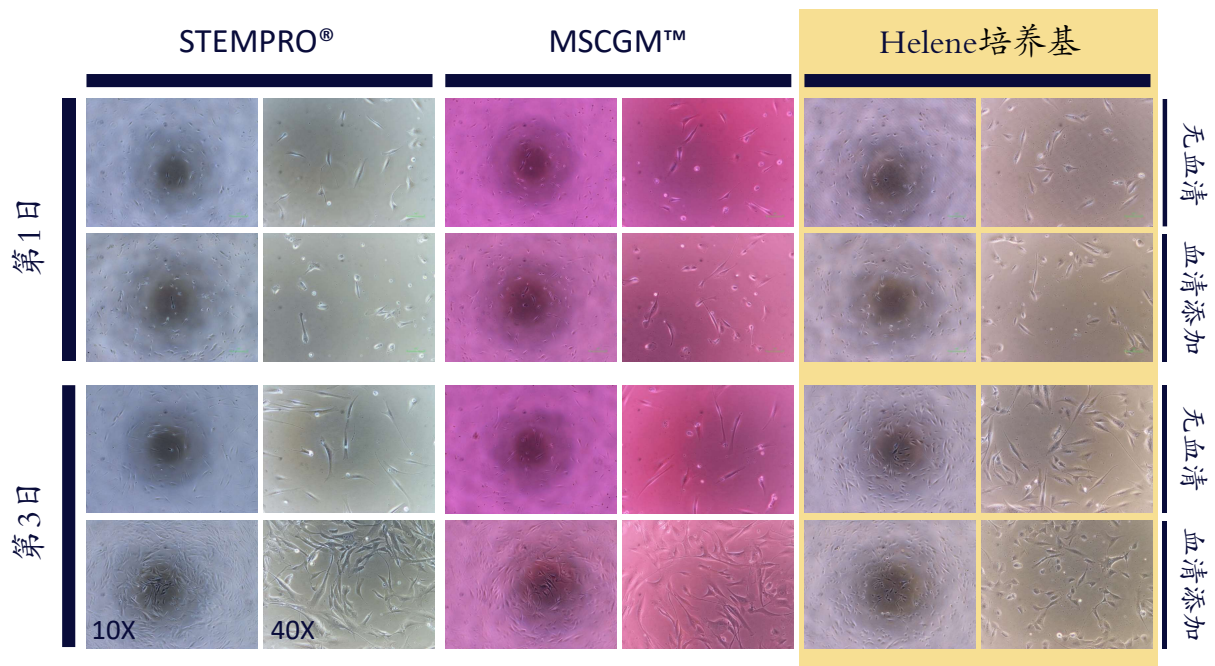
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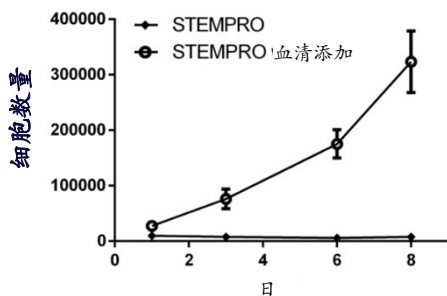
干细胞培养有别于一般细胞及癌细胞培养，于血清浓度、培养流程以及培养基都需更精密的调整，而其中最为关键的是培养基的选择。敝公司在日本开设诊所提供干细胞治疗，为了提供客户效率和安全兼具的治疗，敝公司致力于研发与精进干细胞培养专用的培养基：Helene培养基。在此研究中，我们将Helene培养基和另外两家市售培养基相比较，项目包括细胞生长速率、细胞型态等，又因血清可能引发细胞分化，我们另外加入了血清添加与否的变因后进行试验。结果显示，在Helene培养基中培养的干细胞展现了较佳的生长速度以及更为稳定的细胞型态。



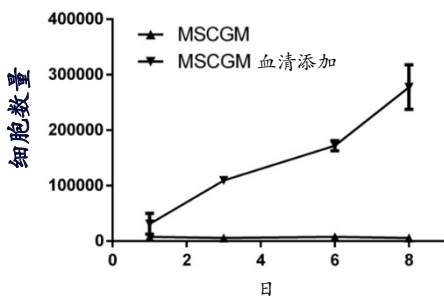
在第一日的培养中，各组都没有显著差异。而在第三日，敝公司所研发的干细胞培养专用培养基不论在细胞生长或是细胞型态的稳定性上都远胜市售培养基。



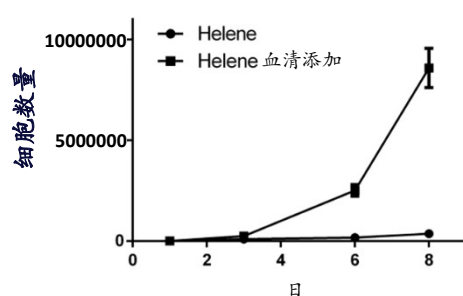
细胞在STEMPRO®中培养之生长速率



细胞在MSCGM™中培养之生长速率

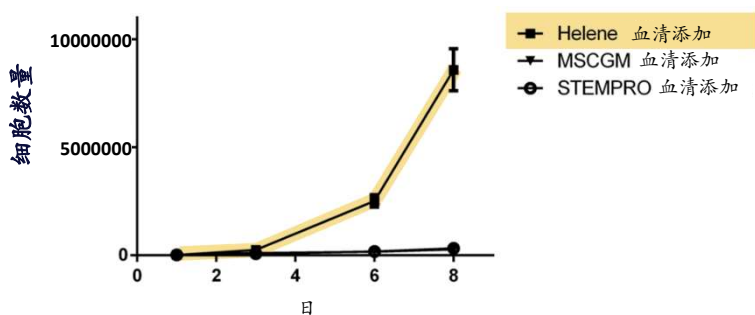


细胞在Helene Medium中培养之生长速率

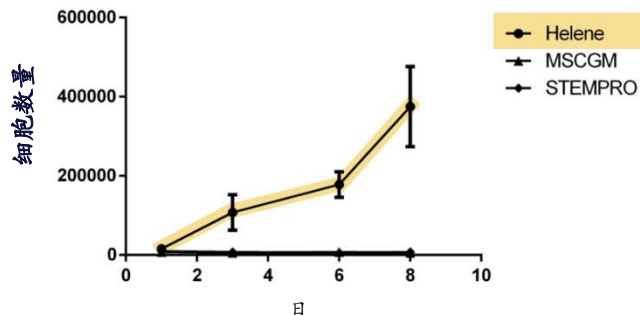


干细胞在未加入血清培养下测定的细胞数量普遍比加入血清培养的条件下少。

添加血清下之细胞数量

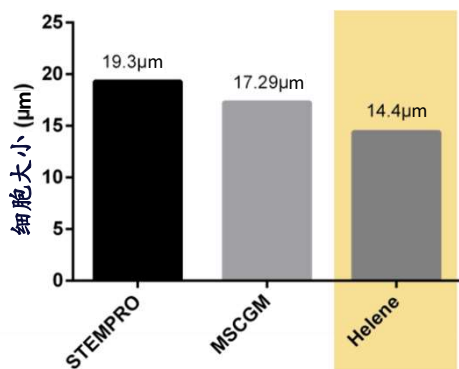


未添加血清下之细胞数量



而不论加入血清与否，敝公司研发的Helene培养基都能使干细胞的数量远超过另外两个市售培养基。这显示干细胞在Helene培养基中有较快的生长速率。

在不同培养基中培养之细胞大小 (添加10%血清)



干细胞的大小被认为是细胞分化倾向的评断标准之一，因其大小较其分化产物纤维芽细胞 (10-15 µm) 为小。左图的结果之中，只有在Helene培养基中培养的细胞呈现干细胞的特性。

