

# Effect of Nano-Oligosaccharide factor (NOSF) on endothelial cell activity *in vitro*

A. Marconi <sup>(1)</sup>, C. Delmau <sup>(2)</sup>, J.-E. Gilbert <sup>(1)</sup> and M. Bouschbacher <sup>(3)</sup>

<sup>(1)</sup> VIGICELL, Villejuif, France. <sup>(2)</sup> UMR972, Villejuif, France. <sup>(3)</sup> Laboratoires URGO, Chenove, France

## INTRODUCTION

During the early stages of the wound healing process, the formation of new capillary vessels from injured blood vessels is essential for the development of granulation tissue, along with effective healing. To achieve this, the endothelial cells – cells constituting the blood vessels lining – must migrate to and proliferate in the provisional matrix. In that regard, the present study aims at evaluating the effects of Nano-OligoSaccharide Factor (NOSF), an ingredient of the **new NOSF lipido-colloid contact layer\***, on the proliferation of endothelial cells *in vitro*.

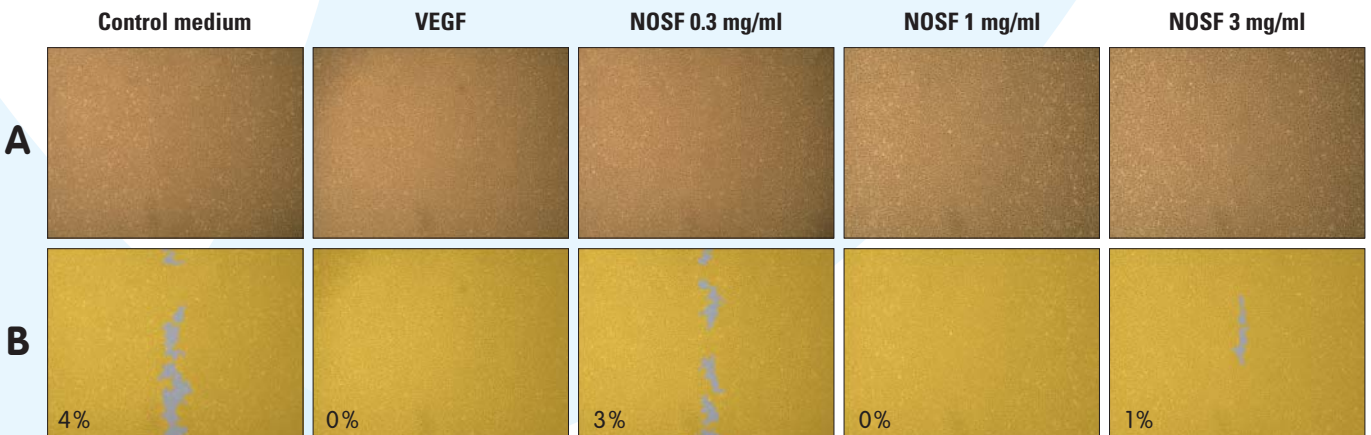
## MATERIAL AND METHODS

The experiments were performed using Human Umbilical Venous Endothelial Cells (HUVEC) freshly isolated from human umbilical cord vein collected from healthy donors. The overall proliferation/migration potential of the endothelial cells was evaluated by a scratch assay. Briefly, a continuous lesion was realized on confluent HUVEC cultures by dragging the tip a 1000µl pipette across the monolayer. NOSF was tested at 3 different concentrations (0.3, 1 and 3 mg/ml). VEGF (10 ng/ml) was used as a positive control and each condition was realized in triplicate. Microscopic observations and photographs were performed after 4, 24 and 48 hours post-scratching. Images were then submitted to an image analysis procedure in order to calculate the uncovered surface.

## RESULTS



**Figure 1:** Illustration of initial lesions 4 hours after monolayer scratch for each condition. (Representative illustrations are shown.)



**Figure 2:** **A.** Unprocessed microscopic photographs of monolayers 24 hours after lesion. **B.** Image analysis of photographs illustrated in A with percentages calculated uncovered surfaces.

24 hours post-scratching, the control condition displayed a clear, but still incomplete recolonization of the lesion. In contrast and as expected, the VEGF condition displayed a complete covering of the initial lesion. In NOSF conditions, lesions showed varying degrees of recolonization, depending of the concentration used. In this regard, NOSF 1 mg/ml presented the best proliferation/migration profile of endothelial cells across the lesion. These observations were confirmed and refined by the image treatment and analysis process. Uncovered surfaces of 4%, 0%, 3%, 0% and 1% left were determined for respectively, the control condition, VEGF, NOSF 0.3 mg/mL, NOSF 1 mg/mL and NOSF 3 mg/mL. 48 hours after scratch, endothelial cell monolayers had covered the remaining space for all conditions tested.

## CONCLUSION

This study demonstrates that NOSF, present in the **new NOSF lipido-colloid contact layer\***, enhances the proliferation and migration of endothelial cells *in vitro*, leading to faster recolonization of the lesion realized in the endothelial cell monolayers. Thus, NOSF has the potential to present an activity on revascularization *in vivo*, an essential process for efficient wound healing.

\* Brand name: The new NOSF lipido-colloid contact layer is Urgotul® START from Laboratoires URGO.