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## The Spray-On Bio-Bandage

Kristine Peterson

Utah State University, kristine.peterson@usu.edu

Amanda Moravek

Utah State University, amanda.moravek@usu.edu

Abby Edward

Utah State University, a02275248@usu.edu

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# Fibrin polymer as a naturally derived spray-on bandage.

Krissy Peterson, Abby Edward, Amanda Moravek, Elizabeth Vargis

## Introduction

- Fibrin is a natural polymer that is already used in extreme clinical settings as an adhesive and for shallow wounds when activated by the enzyme, thrombin
- This study tested a spray-on bandage with thrombin and fibrinogen that enhances the body's healing without the risks of current formulations

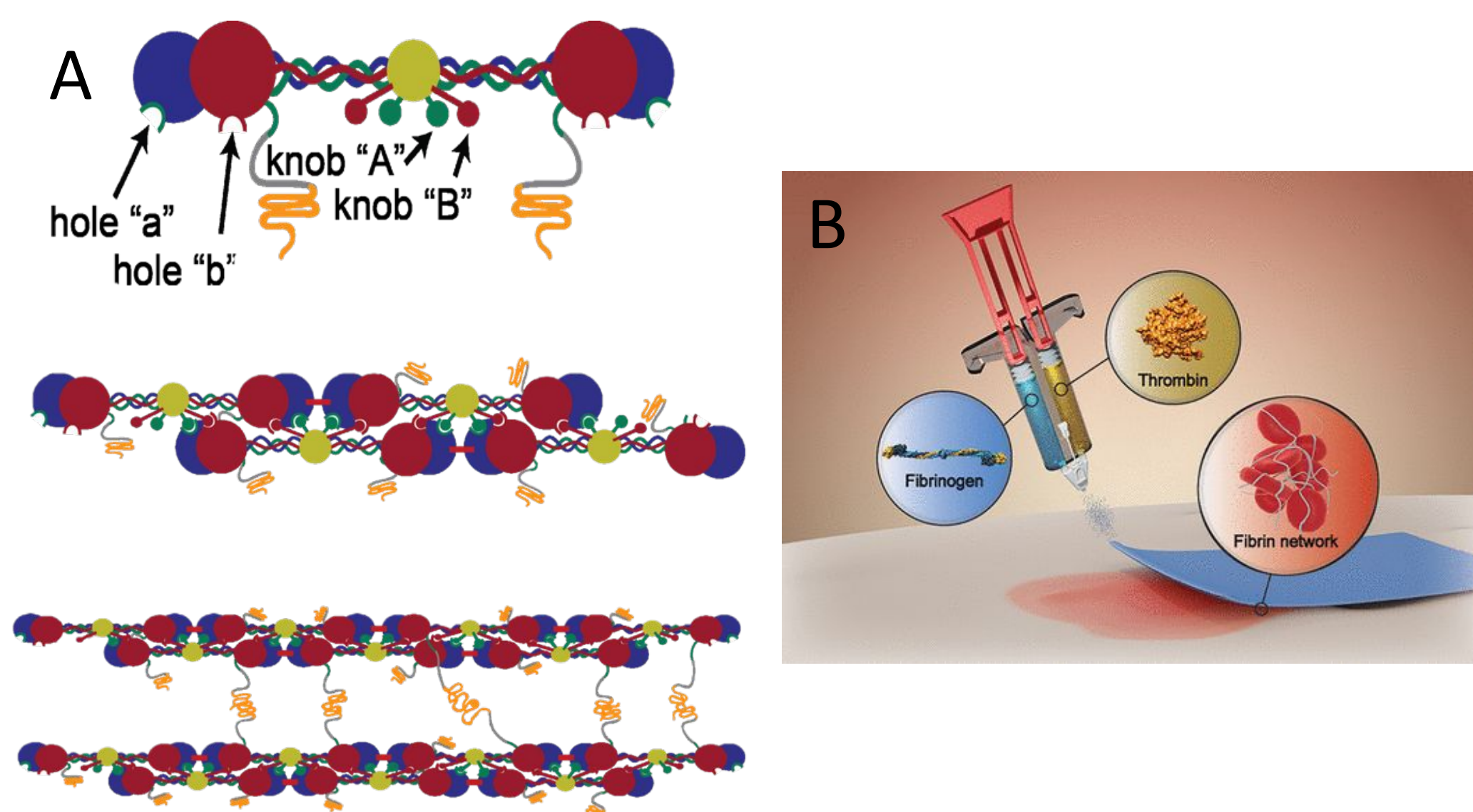
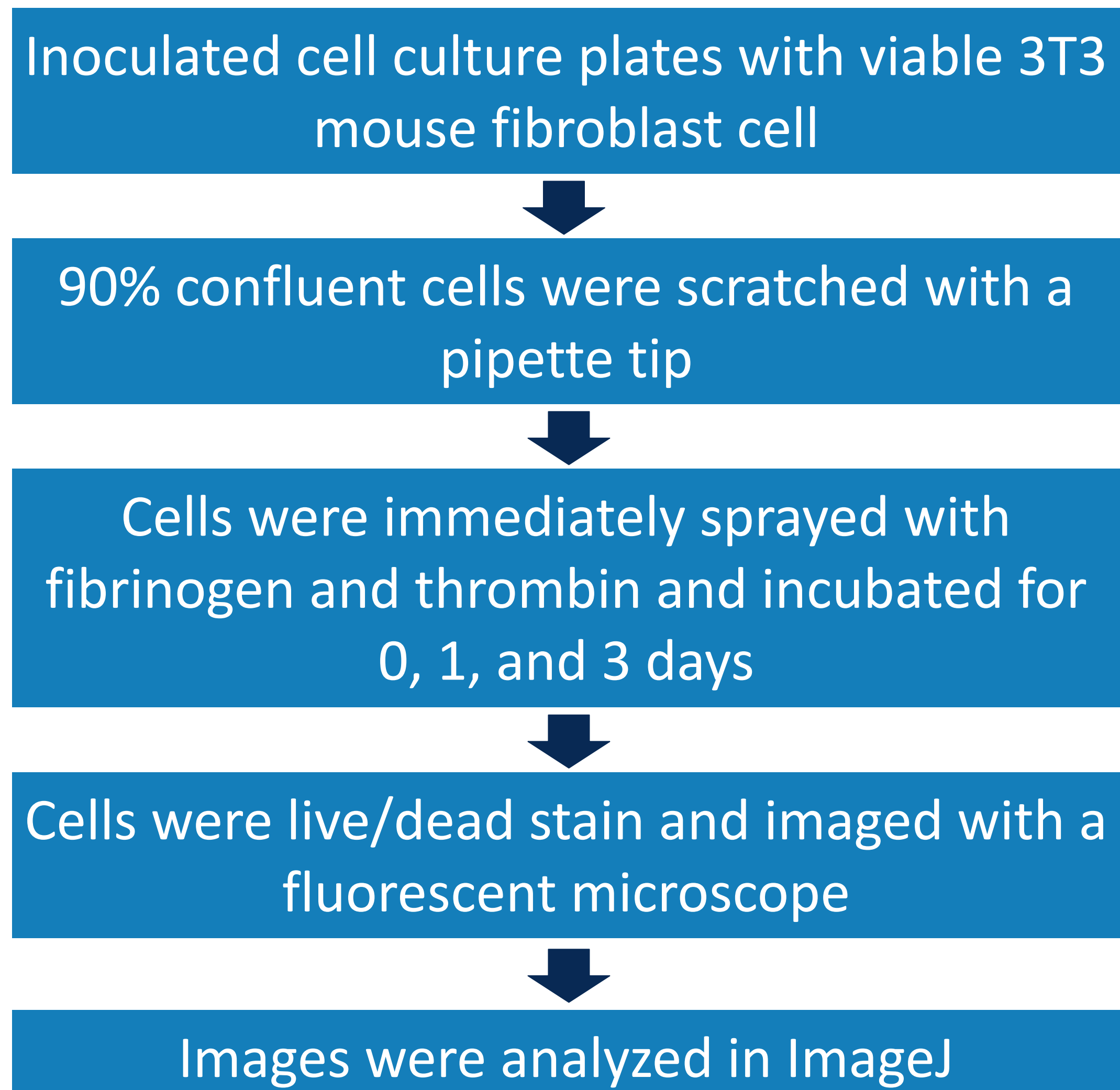


Figure 1. A) Molecular mechanics of fibrinogen formation. B) Application of the spray-on bio-bandage.

## Methods



# The Spray-On Bio-Bandage

## Results

- 3T3 cells were successfully grown to a confluency of 90%
- Clear scratches were made through the cell monolayer
- Fibrin gel formation was successful
- The bottles' spray exerted too much force on the cells and caused additional cell death compared to the untreated cells (Figure 2, treated and untreated cells)
- The cells migrated very quickly through the cleared area, resulting in an unclear healing progress (Figure 2, Days 1 and 3 treated cells)

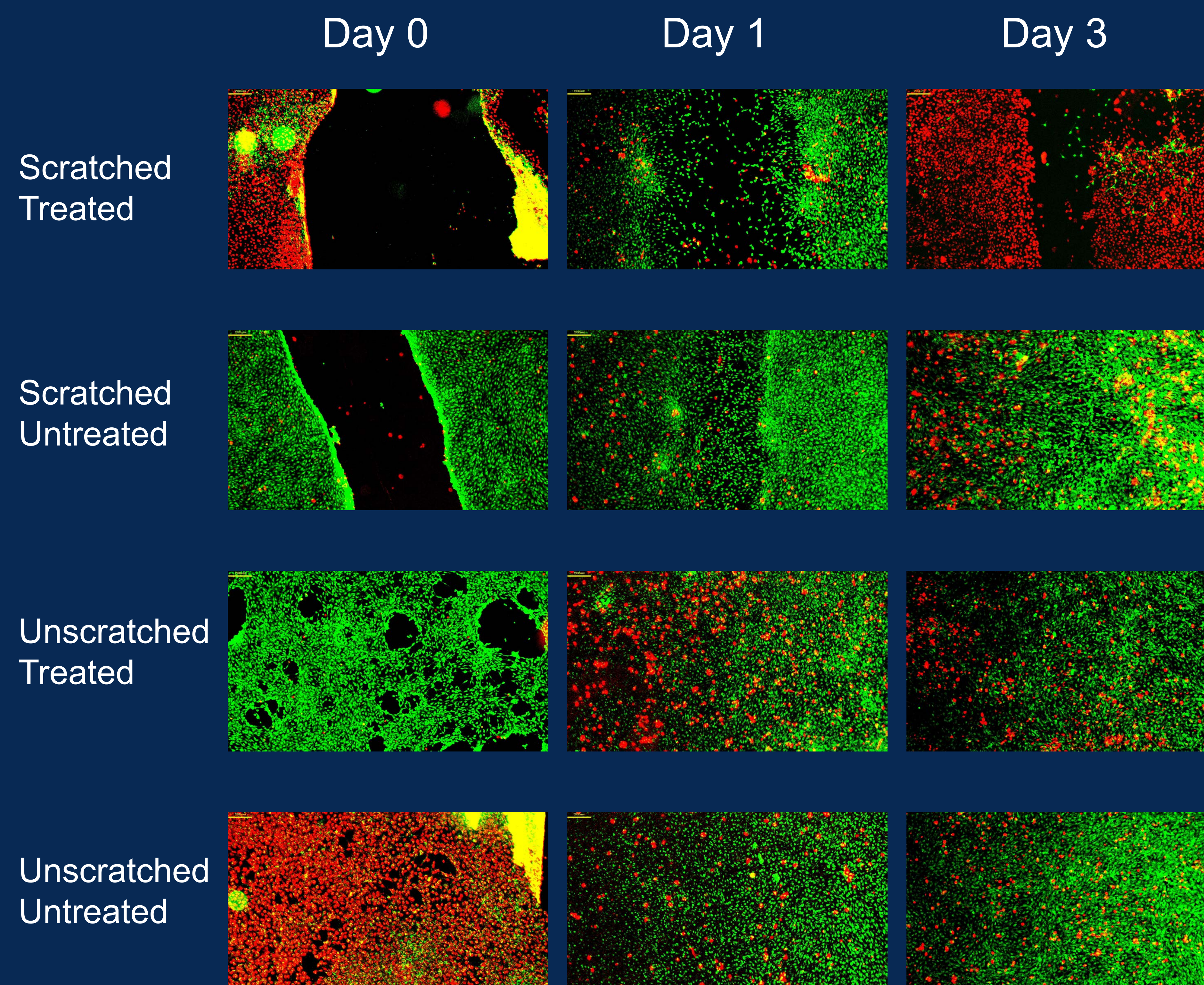


Figure 2. Live/Dead Stain Fluorescence Images

The red color is showing dead cells and green is showing live cells.

## Conclusions

- Cell growth, and fibrinogen formation (Figure 3), and scratching (Figure 4) was successful
- Further research is required to successfully create a spray-on bandage
- Aspects to change include cell scaffolding, spray bottle, and cell growth inhibitors

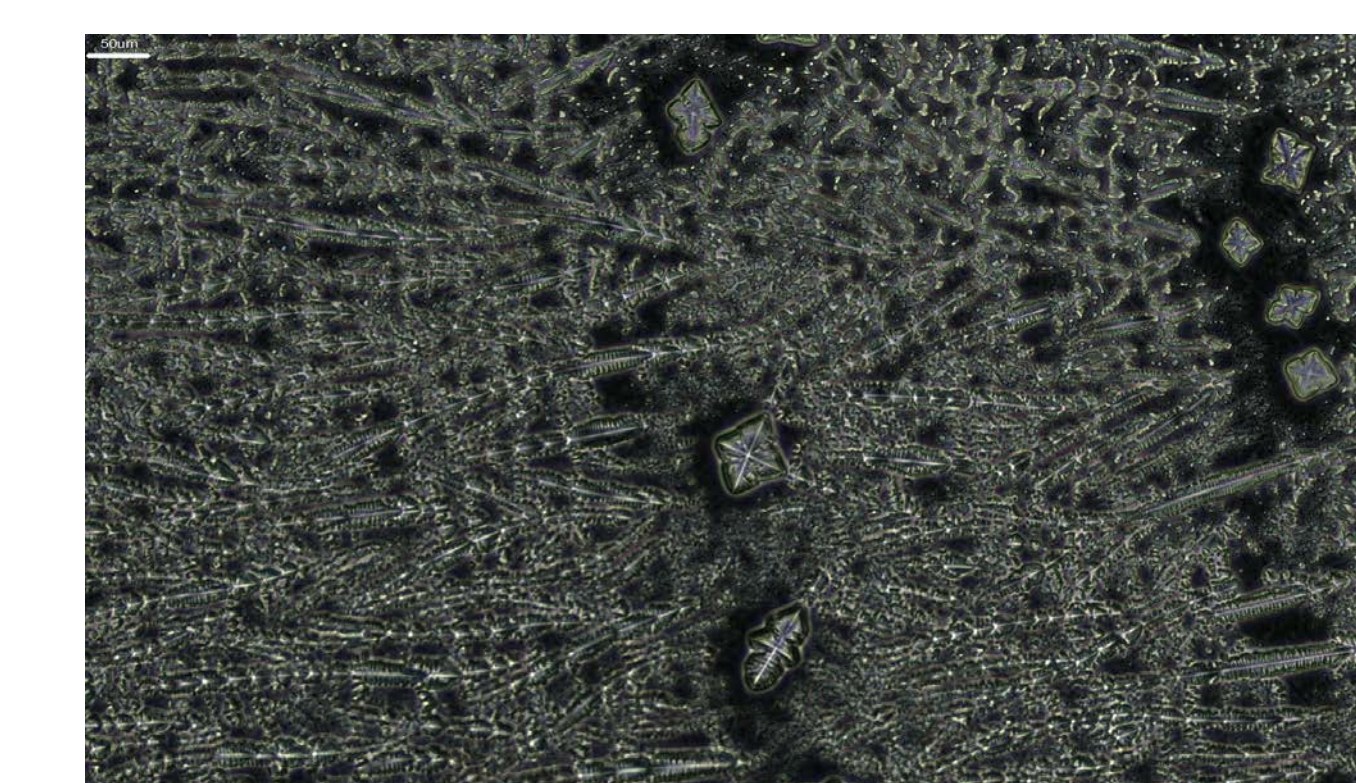


Figure 3. Fibrin gel formation on a petri dish.

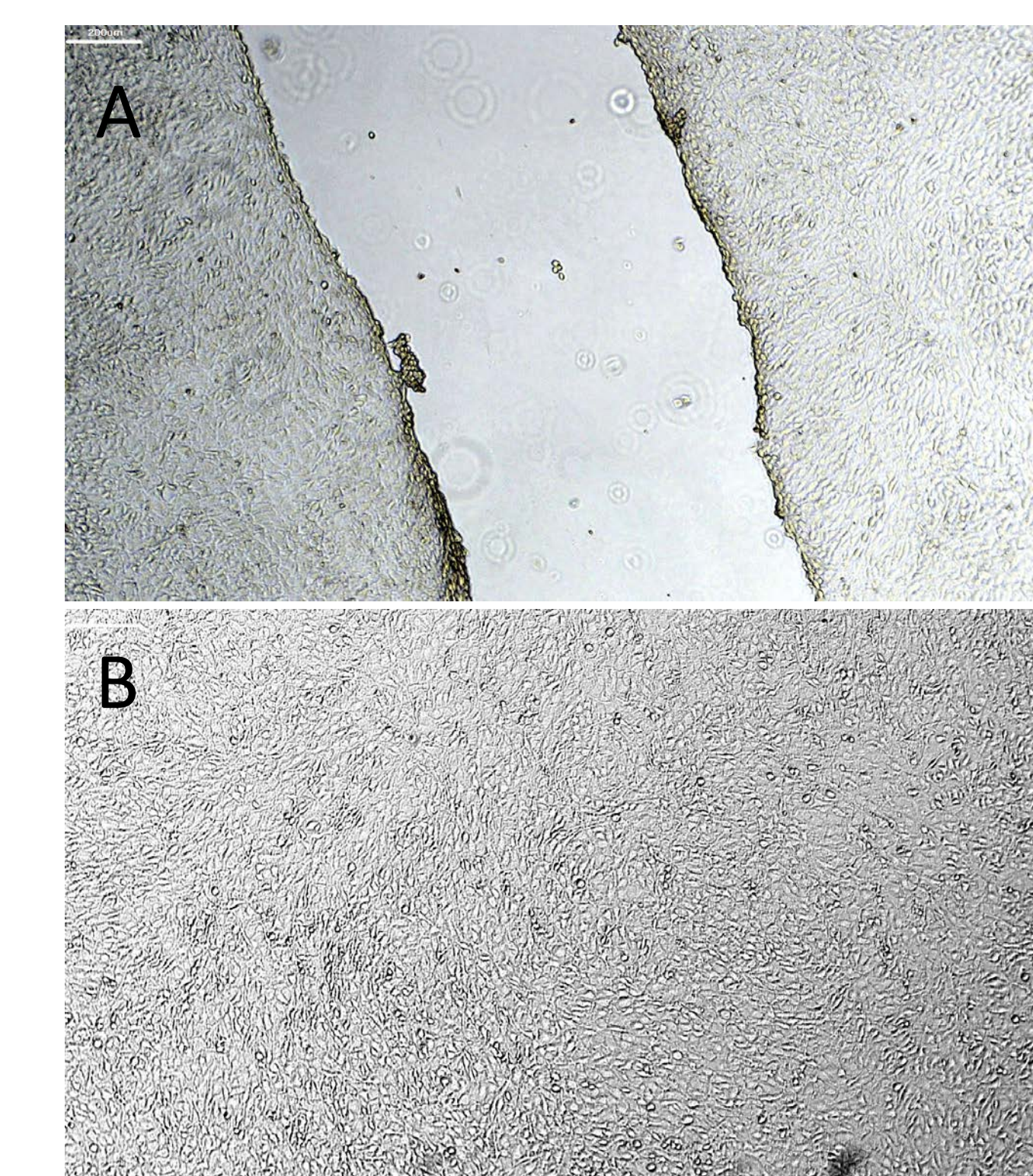


Figure 4. A) Brightfield image of scratched cells. B) Brightfield image of unscratched cells.

## References

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