



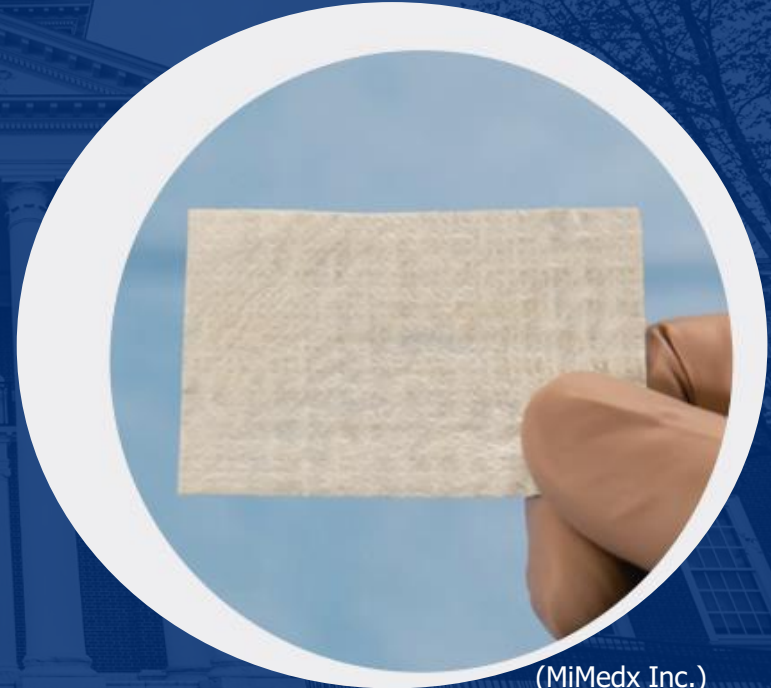
JOHNS HOPKINS  
WHITING SCHOOL  
of ENGINEERING

# AMNIOEFFECT™

Mi Le

EN.585.729.81

Course Project Presentation



(MiMedx Inc.)

# Background



(Dori OConnell, 2008)

- Chronic and postoperative wound complications negatively impact an increasing number of people in the U.S. each year.
- Between 2004 – 2007, almost 2 million surgical procedures in the United States alone required grafts. (Kinaci & Neuhaus)
- Wound treatment is estimated to range from \$28.1 billion – \$96.8 billion across the country.

# Other Products on the Market

## Autografts

- Advantages:  
histocompatibility, safety
- Disadvantages:  
Donor site pain, limited source supply

## AlloPatch ®

- Advantages:  
Easy to store, preserved ECM, growth factor retention
- Disadvantages:  
Aseptically processed, short shelf life, limited supply source

## Architect ® collagen matrix

- Advantages:  
Easy to store, available source material, sterile
- Disadvantages:  
Not human material, high chance of ECM failure

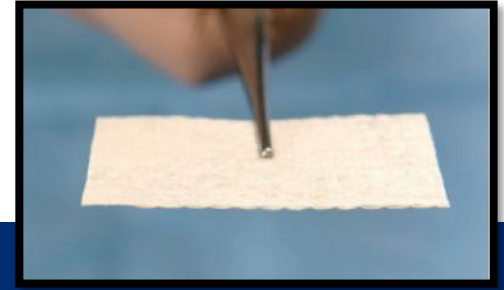
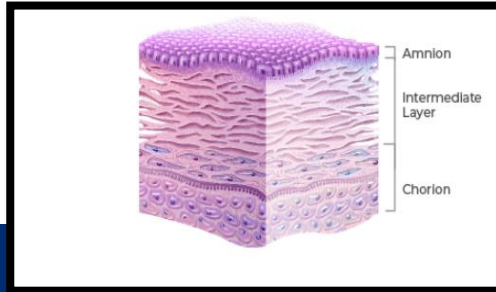
## Hyalomatrix ® tissue reconstruction matrix

- Advantages:  
Easy to store, available source material, sterile
- Disadvantages:  
Lacks basement membrane and does not resemble native skin

## Affinity ® Human Amniotic graft

- Advantages:  
Good regenerative properties, maintains native ECM structure
- Disadvantages:  
Difficult to store

# The AMNIOEFFECT™



- Acts as a topical treatment for wound dressing and can be used for a variety of procedures needing a barrier membrane
- Addresses challenges in the existing treatment of wound closure during surgery
- Uses a unique human placenta-derived ECM (dehydrated amnion-chorion membrane, or dHACM)
- Promotes cell proliferation and migration and positively influences the number of growth factors

# The AMNIOEFFECT™ Solution Description

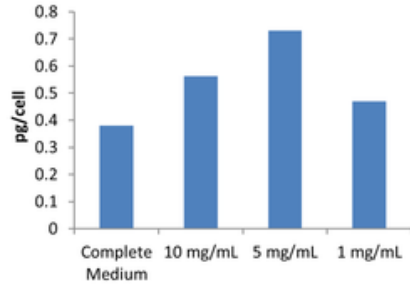
- High cell proliferation ability due to the human dHACM material and preserved bioactivity
- Terminally sterilized for added level of safety
- Lower downstream treatment costs
- Versatile and easy to use
- Low patient recovery time
- Low infection rate



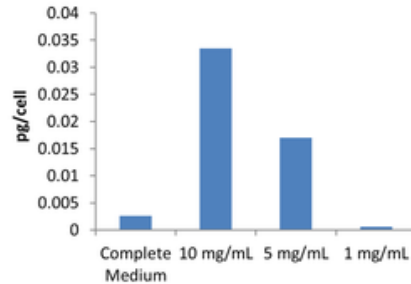
(MiMedx Inc.)

# Verification

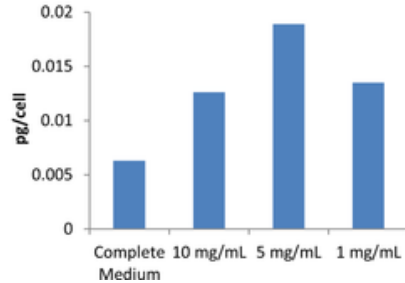
(a) bFGF



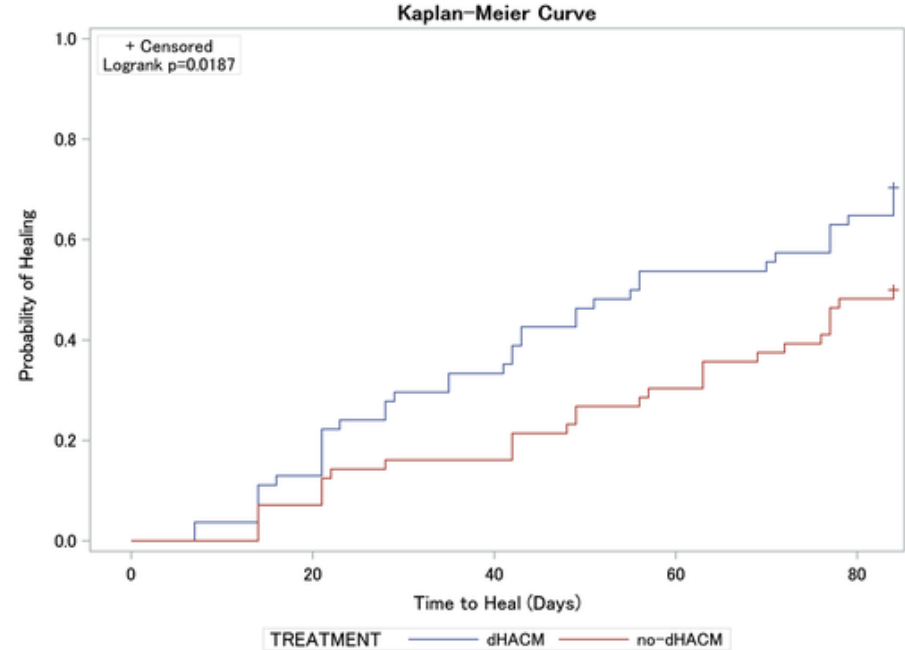
(b) GCSF



(c) PIGF



# Validation



(Koob et al. 2014)

(Tettelbach et al. 2018)



# Conclusion



(MiMedx Inc.)



- The AMNIOEFFECT™ is a favorable product in many aspects due to its multiple benefits, and is a viable skin substitute that will promote the wound healing cascade.

# References

1. "About Us - MIMEDX." *MiMedx*, 1 Aug. 2021, <https://www.mimedx.com/company/about/>.
2. Ahuja, Natasha, et al. "Dehydrated Human Amnion Chorion Membrane as Treatment for Pediatric Burns." *Advances in Wound Care*, vol. 9, no. 11, 2020, pp. 602–611., <https://doi.org/10.1089/wound.2019.0983>.
3. "Allograft vs. Autograft." *Hartford Hospital | Hartford, CT*, <https://hartfordhospital.org/health-professionals/tissue-bank/human-tissue-graft-information/allograft-vs-autograft>.
4. Bennett, John Eugene, et al. "Burns ." Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases, Elsevier, 2020, <https://www.clinicalkey.com/#!/content/book/3-s2.0-B9780323482554003143>.
5. Britto, Errol J., et al. "Issues of Concern." *Wound Dressings*, <https://www.ncbi.nlm.nih.gov/books/NBK470199/>. Accessed 11 Oct. 2022.
6. Choi, Ji Suk, et al. "Full-Thickness Skin Wound Healing Using Human Placenta-Derived Extracellular Matrix Containing Bioactive Molecules." *Tissue Engineering Part A*, vol. 19, no. 3-4, 20 Sept. 2012, pp. 329–339., <https://doi.org/10.1089/ten.tea.2011.0738>.
7. DelveInsight Business Research, LLP. "Advanced Wound Care Market Size Anticipated to Grow with a Substantial CAGR of 10.51% and Extend to USD 16.97 Billion during the Study Period 2018-26, Examines DelveInsight." *Advanced Wound Care Market Size Anticipated to Grow with a Substantial CAGR of 10.51% and Extend to USD 16.97 Billion During the Study Period 2018-26, Examines DelveInsight*, 19 Oct. 2021, <https://www.prnewswire.com/news-releases/advanced-wound-care-market-size-anticipated-to-grow-with-a-substantial-cagr-of-10-51-and-extend-to-usd-16-97-billion-during-the-study-period-2018-26--examines-delveinsight-301403475.html>.
8. Henderson, Jessica A., et al. "Innovative Use of DHACM in Conjunction With Hyperbaric Oxygen Therapy to Treat a Nonhealing Nasal Wound Subsequent to Squamous Cell Carcinoma Resection and Radiation: A Case Study." *Hmpgloballearningnetwork.com*, Wound Care Learning Network, Mar. 2019, <https://www.hmpgloballearningnetwork.com/site/wounds/case-report-and-brief-review/innovative-use-dhacm-conjunction-hyperbaric-oxygen-therapy>.
9. *Integra Lifesciences*. <https://www.integralife.com/file/general/1453796564.pdf>.
10. Kinaci, Ahmet, et al. "Trends in Bone Graft Use in the United States." *Orthopedics*, vol. 37, no. 9, 2014, <https://doi.org/10.3928/01477447-20140825-54>.
11. Koob, Thomas J, et al. "Biological Properties of Dehydrated Human Amnion/Chorion Composite Graft: Implications for Chronic Wound Healing." *International Wound Journal*, vol. 10, no. 5, 2013, pp. 493–500., <https://doi.org/10.1111/iwj.12140>.
12. Koob, Thomas J., et al. "Properties of Dehydrated Human Amnion/Chorion Composite Grafts: Implications for Wound Repair and Soft Tissue Regeneration." *Journal of Biomedical Materials Research Part B: Applied Biomaterials*, vol. 102, no. 6, 2014, pp. 1353–1362., <https://doi.org/10.1002/jbm.b.33141>.
13. Marangon FB, Alfonso EC, Miller D, Remonda NM, Muallem MS, Tseng SC. Incidence of microbial infection after amniotic membrane transplantation. *Cornea*. 2004 Apr;23(3):264-9. doi: 10.1097/00003226-200404000-00008. PMID: 15084859.
14. MiMedx. *AMNIOEFFECT*, MiMedx Group Inc. , Marietta, GA, 2022, <https://www.mimedx.com/wp-content/uploads/2022/08/US-LS-2100002-AMNIOEFFECT-PRODUCT-BROCHURE.pdf>. Accessed 2022.
15. "MIMEDX Announces Launch of AMNIOEFFECT." *Biotechnology News Magazine*, 19 Sept. 2022, <https://biomag1.com/mimedx-announces-launch-of-amnioeffect/>. Accessed 11 Oct. 2022.



# References

16. "MIMEDX Announces Launch of AMNIOEFFECT™." *GlobalNewswire*, 19 Sept. 2022, <https://www.globenewswire.com/en/news-release/2022/09/19/2518149/0/en/MIMEDX-Announces-Launch-of-AMNIOEFFECT.html>. Accessed 11 Oct. 2022.
17. "MIMEDX Announces Second Quarter 2022 Operating and Financial Results." *Yahoo News*, 2 Aug. 2022, <https://www.yahoo.com/now/mimedx-announces-second-quarter-2022-200500205.html>. Accessed 11 Oct. 2022.
18. Nelson, Holly Daniels. "Chronic Wounds Affect 6.5 Million in U.S." *Intermountain Healthcare*, 25 Apr. 2017, <https://intermountainhealthcare.org/blogs/topics/live-well/2017/04/chronic-wounds-affect-65-million-in-us/>.
19. O'Connell, D. [https://www.istockphoto.com/photo/medical-dressing-gm172910028-6340090?utm\\_medium=organic&utm\\_source=google&utm\\_campaign=iptcurl](https://www.istockphoto.com/photo/medical-dressing-gm172910028-6340090?utm_medium=organic&utm_source=google&utm_campaign=iptcurl)
20. Przybylski, Mallory. *Hmpgloballearningnetwork.com*, July 2018, <https://www.hmpgloballearningnetwork.com/site/twc/articles/amniotic-membrane-allografts-outpatient-wound-clinic-current-practice-guidelines-modalities#:~:text=This%20easy%2Dto%2Dapply%20graft,from%20the%20date%20of%20processing>.
21. Sen, Chandan K. "Human Wound and Its Burden: An Updated Compendium of Estimates." *Advances in Wound Care*, vol. 8, no. 2, 2019, pp. 39-48., <https://doi.org/10.1089/wound.2019.0946>.
22. Sen, Chandan K., et al. "Human Skin Wounds: A Major and Snowballing Threat to Public Health and the Economy." *Wound Repair and Regeneration*, vol. 17, no. 6, 2009, pp. 763–771., <https://doi.org/10.1111/j.1524-475x.2009.00543.x>.
23. Snyder D, Sullivan N, Margolis D, et al. Skin Substitutes for Treating Chronic Wounds [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US); 2020 Feb 2. Appendix D. Commercially Available Skin Substitute Products. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK554211/>
24. Sperry, Mary L. "AMNIOEFFECT - Trademark Details." *Justia*, Legal information retrieval, 20 Oct. 2021, <https://trademarks.justia.com/970/83/amnioeffect-97083409.html>. Accessed 11 Oct. 2022.
25. "Surgical Site Infection Event (SSI) ." *National Healthcare Safety Network, Center for Disease Control*, Jan. 2022, <https://www.cdc.gov/nhsn/pdfs/pscmanual/9pscscsscurrent.pdf>.
26. Tettelbach, William, et al. "A Confirmatory Study on the Efficacy of Dehydrated Human Amnion/Chorion Membrane Dhacm Allograft in the Management of Diabetic Foot Ulcers: A Prospective, Multicentre, Randomised, Controlled Study of 110 Patients from 14 Wound Clinics." *International Wound Journal*, vol. 16, no. 1, 2018, pp. 19–29., <https://doi.org/10.1111/iwj.12976>.
27. Tettelbach, William H, et al. "Cost-Effectiveness of Dehydrated Human Amnion/Chorion Membrane Allografts in Lower Extremity Diabetic Ulcer Treatment." *Journal of Wound Care*, vol. 31, no. Sup2, 2022, <https://doi.org/10.12968/jowc.2022.31.sup2.s10>.
28. Unal, Sakir, et al. "Analysis of Skin-Graft Loss Due to Infection." *Annals of Plastic Surgery*, vol. 55, no. 1, 2005, pp. 102–106., <https://doi.org/10.1097/01.sap.0000164531.23770.60>.
29. "Wound Healing." *Benefits and Limitations of Placental Tissue for Wound Healing*, 22 Feb. 2022, <https://www.thewoundpros.com/post/benefits-and-limitations-of-placental-tissue-for-wound-healing>.



# JOHNS HOPKINS

WHITING SCHOOL  
*of* ENGINEERING