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The development of mineralized collagen scaffolds for bone regeneration

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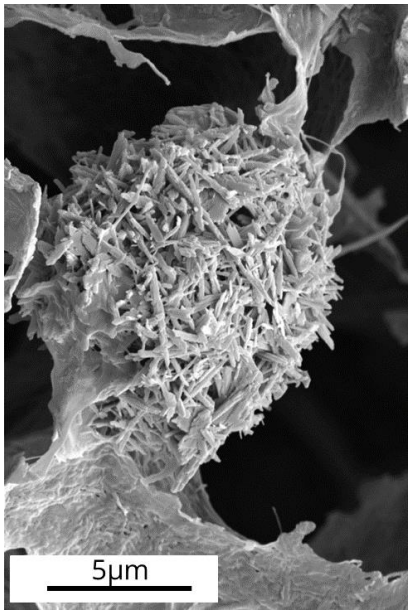
ABSTRACT: Challenges associated with large craniomaxillofacial bone injuries present opportunities to improve bone regeneration by regulating early cell responses (i.e. stem cell recruitment and blood vessel generation) as well as delayed cell responses (i.e. stem cell osteogenesis and angiogenesis).
My project aims to enhance our current mineralized collagen scaffolds to elicit specific cellular responses and improve bone regeneration in large scale injuries. To this end, I have been working to supplement our mineralized collagen scaffolds with zinc sulfate and to incorporate growth factors via non-covalent interactions.



AWARDS/PUBLICATIONS:

- NSF Graduate Research Opportunities Worldwide (GROW) Fellowship, 2019
- TA Ranked as Excellent (Crop Sciences), 2018
- NSF Graduate Research Fellowship, 2017
- Alfred P. Sloan Scholar, 2016
- GEM University Fellow, 2016
- **A.S. Tiffany**, D.L. Gray, T.J. Woods, K. Subedi, B.A.C. Harley, 'The inclusion of zinc into mineralized collagen scaffolds for craniofacial bone repair applications,' *Acta Biomater.,* 2019.
- X. Ren, Q. Zhou, D. Foulad, **A.S. Tiffany**, M.J. Dewey, D. Bischoff, T.A. Miller, R. Reid, T.-C. He, D.T. Yamaguchi, B.A.C. Harley, J.C. Lee, 'Osteoprotegerin reduces osteoclast resorption activity without affecting osteogenesis on nanoparticulate mineralized collagen glycosaminoglycan scaffolds,' *Sci. Adv.*,2019.
- W.K. Grier*, **A.S. Tiffany*,** M.D. Ramsey, B.A.C. Harley, 'Incorporating β-cyclodextrin into collagen scaffolds to sequester growth factors and modulate MSC activity,' *Acta Biomater.*, 2018. * co-first authors.