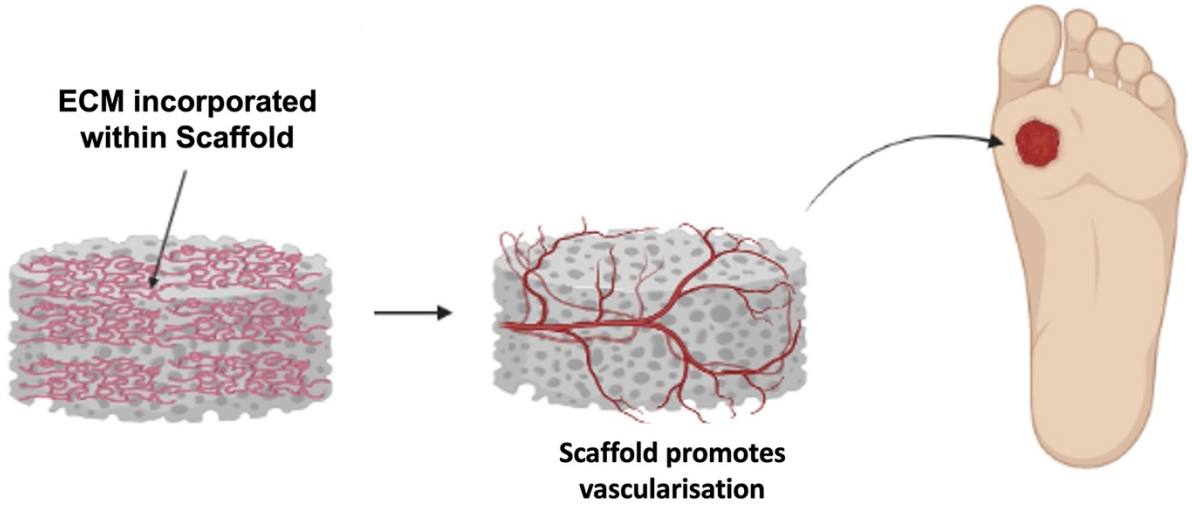
Diabetes Mellitus is a chronic systemic disease, which is becoming increasingly prevalent with projections of about half a billion people affected worldwide by 2030. Specifically in Ireland, there are projections for almost 300,000 individuals with diabetes by 2030.
In diabetic patients, dysregulation occurring in the wound healing process ultimately leads to chronic wounds as the skin fails to heal. Blood vessel formation is a key stage in wound healing. This is significantly dysfunctional in diabetics and it reduces the regenerative potential of the tissue, resulting in chronic wounds, with 19-34% of diabetics likely to be affected. Chronic wounds eventually offer a port of entry for microorganisms, leading to repeated infections, tissue necrosis and may develop into a life-threatening situation with a significant number of cases requiring limb amputation. This has a massive detrimental effect on the standard of living of diabetic patients and is a considerable burden on the healthcare system and on the society.

As it stands, the current therapeutic approaches do not provide a satisfactory solution to this problem which remains unresolved.

In this project, we will strive to address the deficit in treatment modalities for DFU by harnessing expertise in biomaterials development, stem cells, extracellular matrix biology, and tissue structure expertise to engineer extracellular matrix-derived scaffolds aimed at stimulating wound healing, tissue regeneration and restoration of cutaneous barrier function. Our approach applies 3D culture of cells on scaffolds and will be assessed in pre-clinical wound healing models.



Overall we aim in this project to address gaps in current diabetic wound treatments using a novel tissue engineering approach that can lead to the development of a successful therapy for diabetic wounds, thus preventing associated complications including amputation, thus improving quality of life for diabetic patients.