Phytochemical analysis of two Australian native plants and their effects on wound healing.

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Background: The wound repair process can take place in almost all tissues upon exposure to any destructive stimulus. A wound that exhibits a loss of balance in the normal physiological mechanism of healing is classified as chronic and as such, has become a significant burden to patients and national health services globally. Approximately six million people suffer from chronic wounds worldwide. Annually, Australia spends $27.5 million to provide care for just a single type of chronic wound. More than 60% of the world's population depend upon medicinal plants. Plants provide a wide range of bioactive compounds that have the potential to be used in pharmaceutical research and drug discovery. This project aims to isolate and identify bioactive compounds from two Australian native plants and determine their wound healing effects.

Methodology: Different parts from plant species (denoted 8480, 8481) will be dried at 40°C, ground to a powder and individually incubated in six different solvents for 24 hours. These extracts will be screened against common wound-colonising bacteria to assess their antimicrobial activity using the well diffusion assay. Extracted compounds will be separated using HPLC. Proliferative and cytotoxic effects of the bioactive compounds will be determined *via* the xCELLigence platform and MTT assay respectively. Any potential morphological changes to either human keratinocyte or fibroblast cells will be identified using phase contrast microscopy. A cytometric bead array will be used to ascertain the anti-inflammatory activity of the bioactive compounds.

Expected Results: Using the identified bioactive compounds from various plant parts, bactericidal, anti-inflammatory and wound healing properties will be assessed. We hypothesise that the isolated bioactive compounds will have enhanced wound healing properties *i.e.* increased proliferation of keratinocytes and fibroblasts, as well as a reduction in inflammation and microbial load within the wound.

Conclusion: Isolated bioactive extracts from species 8480 and 8481 will reduce microbial load and inflammation of wounds and accelerate the normal wound healing process.

Real World Implications: Potential production of a novel drug which can significantly enhance the healing of chronic wounds.