

EPUAP

2022

The 22nd Annual Meeting of the
European Pressure Ulcer Advisory Panel

14 – 16 September 2022, Prague, Czech Republic

www.epuap2022.org



ABSTRACT BOOK

Partnerships: Masaryk University, Faculty of Medicine, Brno; Institute of Health Information and Statistics;
Czech Wound Management Association; Ministry of Health of the Czech Republic



10.2

AN OPTIMISED METHOD TO ANALYSE INFLAMMATORY MARKERS FROM SEBUM AND ITS ROLE IN DETECTING SKIN DAMAGE

Hemalatha Jayabal¹, Nkemjika Abiakam¹, Peter Worsley¹, Dan Bader¹

¹ University of Southampton, Southampton, United Kingdom

Introduction: Inflammatory biomarkers are present in varying concentrations in a range of biofluids, with an important signaling role to maintain homeostasis. Commercial tapes have been employed to non-invasively collect these biomarkers in sebum from the skin surface to examine their concentrations in various conditions such as acne, dermatitis and pressure ulcers (PU) [1]. However, the identification of robust biomarker candidates is limited by the low abundance of specific proteins [2]. Therefore, this study aimed at developing an optimized extraction method of protein markers from skin surface and test this on a range of skin damage models.

Methods: A systematic study of chemical and mechanical approaches to optimized protein extraction were conducted employing pre-coated commercial tapes with synthetic sebum model. The extraction efficiency of a panel of relevant cytokines was assessed. The optimized approach will then be tested on a range of skin insult models including pressure, moisture induced damage and patients presenting with category 1 PU.

Results: The results revealed that the use of surfactant, i.e. β -dodecyl maltoside in addition to the mechanical stimuli, namely sonication and centrifugation resulted in an increased recovery of cytokines, ranging up to 80% for high-abundant cytokines, such as IL-1 α and IL-1RA, and up to 50% for low-abundance cytokines, including TNF-alpha, IL-6 and IL-8.

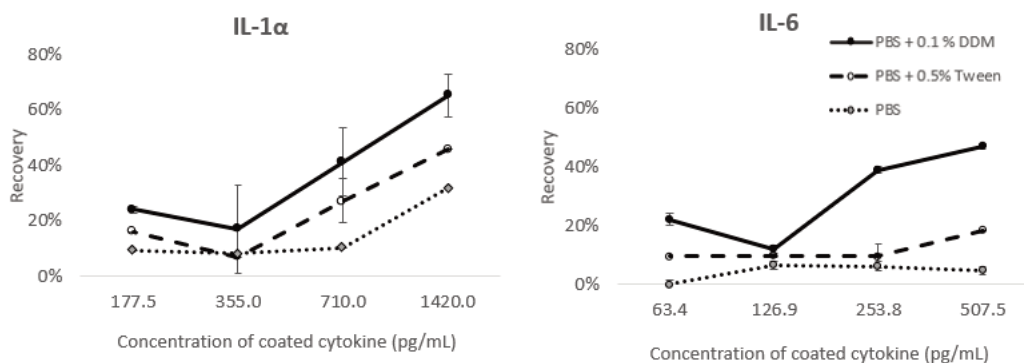


Figure 1: Percentage recovery of high-abundance (IL-1 α) and low-abundance cytokine (IL-6) for three different extraction buffers

Conclusions: The optimized protocol will provide means to identify robust markers from skin surface that could be collected non-invasively in clinical situations involving vulnerable individuals. Indeed, the new protocol will be employed in future studies at the host laboratory involving patients with grade I PUs to identify novel predictive markers of skin health.

References

- [1] D. Bronneberg et al., "Cytokine and chemokine release upon prolonged mechanical loading of the epidermis," *Exp Dermatol*, vol. 16, no. 7, pp. 567-73, Jul 2007, doi: 10.1111/j.1600-0625.2007.00566.x.
- [2] A. Gramolini, E. Lau, and P. P. Liu, "Identifying Low-Abundance Biomarkers," *Circulation*, vol. 134, no. 4, pp. 286-289, 2016, doi:10.1161/CIRCULATIONAHA.116.022940.