ABSTRACT BOOK ABSTRACTS



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MELANOMA AND MELANOCYTIC NAEVI

## SNIFFING OUT MELANOMAS USING VOLATILE ORGANIC COMPOUNDS

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Introduction: It has been observed that the spectrum of metabolic gases, or volatile organic compounds (VOCs), emitted from individuals with cancers and other medical conditions is different from healthy individuals. A potential application for the use of these gas phase biomarkers is in distinguishing malignant melanomas from benign pigmented lesions.

Objective: To investigate the use of VOCs emitted from skin as a means of providing diagnostic information to help identify melanomas compared with non-melanomas skin lesions.

Materials and methods: Study participants were recruited from patients attending dermatology outpatient clinics between February and May 2017. Eligible patients were those with a clinical diagnosis of an atypical naevus or suspected melanoma who had been offered surgical excision as part of their standard clinical care. Prior to surgery, gas samples were collected using a non-invasive probe applied over the skin lesion that suctioned the surrounding air into a portable mass-spectrometer (1st Detect MMS-1000, US). This measured the mass abundances of any VOCs being emitted from the skin in real time. Gas samples were also collected from skin adjacent to the skin lesion to act as controls.

Results: The histological diagnoses of 52 skin lesions were categorised as superficial spreading malignant melanoma (n=6); nodular melanoma (n=2); melanoma in-situ (n=4); benign naevi (n=17); dysplastic naevi (n=9); 'other benign' lesions (n=12) and 'other cancerous' lesions (n=2). Gas samples were analyzed using a 6-layer, fully connected deep neural network to classify the data. The signals obtained from melanomas were significantly different from non-melanomas with a sensitivity and specificity of 100%.

Conclusion: Our results indicate that analysis of VOCs using mass spectrometry is capable of differentiating melanomas from other skin lesions that may appear similar to melanomas clinically. We therefore advocate further study in to the diagnostic applications of this











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