Mechanisms that facilitate the metastatic potential in oral carcinomas.

General Background: For OCSCC, metastatic nodal involvement is one of the only reliable clinical indicators of poor prognosis. However, it is difficult to assess pre-operatively with imaging as metastases can occur microscopically, can spread in an unpredictable anatomical manner (e.g. appear sporadically throughout tissue), and may occur contra-laterally despite a lateralised primary tumour. Surgical neck dissection is the only modality that currently provides accurate staging information but is an invasive procedure. Additionally, there are no consensus guidelines on when to perform a neck dissection, and whether the neck dissection should be bilateral, particularly for early stage tumours. Therefore, current clinic-pathological staging is unable to consistently identify patients at risk of nodal involvement or distant spread.

Molecular processes that facilitate metastatic potential are key biological events that drive patient prognosis. Thus, as proposed in this project, the comprehensive examination of tumour vesicles secreted into body fluids and metastatic lesions is pertinent and likely to yield key biological insights, as these tissue resources are likely to be enriched for mechanisms that facilitate metastatic spread. To date, little research has been performed in OCSCC, investigating these metastatic resources for mechanisms that facilitate tumour dissemination. The ability to accurately and noninvasively predict metastatic nodal involvement of OCSCC has the potential to revolutionise patient management, by improving disease stratification for the appropriate allocation, escalation or avoidance of treatment. Furthermore, these molecular changes that enable the metastatic potential of OCSCC may form unique biomarkers of prognosis that could additionally be utilised for monitoring treatment response, post-treatment surveillance, or prediction of malignant transformation of premalignant disease.

Overarching Research Questions: What are the molecular reasons for the development of metastatic disease, with nodal involvement being one of the most reliable clinical features to predict poor prognosis for OCSCC? And can these molecular changes be utilised as biomarkers to identify poor prognosis disease or nodal involvement?

Other details: In this translational, cutting edge project you will work with clinicians, pathologists, oncologists and scientists. You will learn a variety of techniques including (but not limited to) differential ultracentrifugation, enzyme-linked immunosorbent assays, flow cytometry, immunohistochemistry and next generation sequencing. The supervisors for this project are Dr Katie Meehan and Dr Annette Lim. All laboratory work will be conducted in the Translational Cancer Pathology Laboratory located at QEII Medical Center in Nedlands. If you would like additional information regarding this project, please email katie.meehan@uwa.edu.au or call (+61 8) 9346 2499.

If you have questions about how to apply to become a PhD student at UWA, please email pghelp@postgraduate.uwa.edu.au or call (+61 8) 6488 2807.