## Project overview

<table>
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<tr>
<th>Project name</th>
<th>The quantitative Malignancy Index Diagnostic System (qMIDS)</th>
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### Technology & product description

The quantitative Malignancy Index Diagnostic System (qMIDS) is a new molecular assay based on the accurate measurement of a panel of 16 biomarkers associated with FOXM1 (ISMCCBBPR Molecule of the Year 2010). As well as enabling improved sensitivity and accuracy of early OSCC detection at low cost, allowing for early intervention when treatment regimens are substantially more effective, qMIDS offers an indication of the aggressiveness of a particular biopsy tissue ensuring individual patients receive the relevant amount of treatment and appropriate best suited treatment strategy. As well as oral cancer, FoxM1 is associated with a variety of additional cancer types and similar validation on human skin cancer demonstrates the potential of this assay to revolutionise SCC clinical diagnostics.

Patients with OSCC often present with symptoms at a late stage, and there is a high recurrence rate after treatment, especially in those with neck lymph node metastasis. The death rate due to squamous cell carcinoma in the US is higher than cancer of the cervix, brain, testes and ovary equating to one death every hour. Most dentists provide screening capability, performing an examination of the oral cavity as part of a routine dental visit using specifically designed scanning techniques to identify areas of abnormal cells, including VizLite Plus used by 12,000 US dentists. There remains an imperative need for sensitive diagnostics to partner this screening effort to improve early detection of OSCC.

### R&D or commercialized stage of project

- □ Early stage of research
  - □ Testing
- □ Pilot stage
- □ Trial production stage
- □ Industrialization stage

### Technology sector

- □ ICT
  - □ Biomedical & chemical medicine
- □ New material
- □ Mechanical and electronic integration
- □ Environment Protection
- □ New energy and energy-efficiency
Potential in Chinese market

Oral cancer in the form of Oral Squamous Cell Carcinoma (OSCC) is one of the top ten cancers, representing 3% of all malignancies in men and 2% in women. Over the last few decades, the overall 5-year survival rates for OSCC have remained both disappointingly low and unchanged at 57%. This is largely due to late stage diagnosis of the condition as this figure rises to 90% when detected early. Diagnosis currently relies on an oral examination by a dentist or qualified health care provider followed by a pathological examination under the microscope of biopsy samples. This method lacks sensitivity and is both costly and slow.

Globally, tobacco consumption in all its forms is the commonest etiological risk factor. The prevalence of specific risk factors, particularly the chewing of betel (areca nut) quid in south and south-central Asia, produces chronic and potentially malignant lesions from which the majority of oral cancers arise. Betel chewing is rooted in Asian social customs and the ingredients are easily accessible. Several hundred million people today practice the ancient practice of chewing betel. Although the custom is losing popularity in Thailand and Cambodia, it is gaining in other Asian countries, and according to Asian health officials, many new betel users are adolescents and children.

Most new cancer cases (83 percent) occur in the developing world. China has the highest number (2.2 million or 20.3 percent of the world’s cases), where limited radiation facilities make it difficult to treat.

This is also true for oral cancer, where for example in Taiwan, oral cancer represents one of the island’s top 10 causes of death, and has nearly quadrupled in the past 40 years, largely due to the habit of chewing betel nut. A study published by Dr. Liao Yung-po, associate professor of public health at Chung Shan Medical University, showed an increase of 280 percent in oral cancer deaths, with men four times as likely to die of the disease as women. From 2001 to 2009, the death toll in males was 13.31 per annum for every 100,000 men, up from 3.08 per annum in the period 1971 to 1980, an increase of 330 percent. The overall figures for women were lower, but showed a similar increase, reaching 3.08 per 100,000 women between 2001 and 2009, up from 1.18 in the earlier period, an increase of 160 percent. According to Liao’s study, more than 95 percent of oral cavity cancers are squamous cell carcinoma, a type of cancer for which the possible causes include betel nut chewing, cigarette smoking and alcohol consumption. Approximately 85 percent of the patients with oral cancer in Taiwan are regular users of betel nuts.

There remains a clear utility for a sensitive diagnostic technique offering considerable improvement to early detection of OSCC at a stage where treatment
### Intellectual property ownership

A UK provisional patent application was filed on the 27th July 2010 by applicants Queen Mary and Westfield College claiming for a method for diagnosing cancer in a patient or for identifying a patient at risk of developing cancer and a method for monitoring the progression of cancer in a patient whereby both the diagnosis and monitoring includes the use of a specific mathematical algorithm and where the cancer is not limited to Oral Squamous Cell Carcinoma but also a variety of squamous cell carcinoma's and other cancer types. International patent protection will be sought as necessary.

### Project advantages

Diagnosis currently relies on an oral examination by a dentist or qualified health care provider followed by a pathological examination under the microscope of biopsy samples- a method lacking sensitivity and which is both costly and slow. There is a clear need for a sensitive diagnostic technique such as qMIDS offering considerable improvement to early detection at a stage where treatment has a more significant impact on disease morbidity and mortality.

### Business Model

- **Technology Transfer**
  - Technology Licensing
- **Translational Research or Out-sourcing Research**
- **Joint Localize Research**
- **Establish a joint venture company**
- **Others, please specify**
早期癌症诊断方法

目前全球罹患癌症的患者日益增加。很多癌症在晚期才会表现出症状，治疗后的复发率也很高。如果得到前期诊断，90%的癌症都可以治愈。我们迫切需要一种灵敏的诊断方法以提高早期诊断癌症的能力。

伦敦大学玛丽女王学院开发了一项令学术界振奋的分子检定新方法！它基于恶性肿瘤定量指标诊断系统（qMIDS），即对与FOXM1基因相关的22种异常生物标记的精确测量，来早期诊断癌症。该诊断方法成本低廉且灵敏度高，能够更精确地检测癌细胞的存在。这种新技术改善了对恶性肿瘤的检测，使我们可以早期干预，从而治疗方法的有效性显著提高。同时可以确保每个病人接受相应程度的治疗和最适宜的治疗策略。该鉴定方法将为多种癌症的临床诊断带来革命性变化。

我们已经确认了这是一项前景良好的癌症检测技术，并已在世界知识产权组织注册PCT专利：使用恶性肿瘤定量指标诊断系统（qMIDS）来早期诊断癌症。目前我们正在寻找合作伙伴来帮助这项人人期望的技术进入临床造福患者。这对于在分子癌症诊断领域已有建树的公司，或希望在此领域发展的公司来说都是非常好的机会。