Human papilloma virus serology in participants in head and neck 5000

Principle applicant: Tim Waterboer

Co-applicants: Andy Ness and Steve Thomas

Keywords: Human papillomavirus, lifestyle behaviour, survival

Scientific outline

Most cancers of the head and neck are squamous cell cancer. Tobacco and alcohol use are risk factors. Oral infection with human papillomavirus (HPV), especially HPV type 16, is a risk factor for oropharyngeal cancer (OPC). The proportion of OPCs caused by HPV16 infection varies and is estimated to be around 30% in Europe. Only a small proportion of cancers outside the oropharynx are thought to be caused by HPV. Several factors, including age, sex and number of sexual partners, have been reported to be associated with oral HPV infection.

Tim Waterboer and colleagues at the German Cancer Research Center (DKFZ) in Heidelberg have developed a simple bioassay for the role of HPV16 in OPC that has a demonstrated specificity of over 99% and a sensitivity of 95%. Four large studies including approximately 5000 controls from multiple populations in Europe, Latin America and North America have all demonstrated that antibodies against HPV16 viral oncoprotein E6 is a highly specific marker of HPV16(+) OPC, present in less than 1% of controls.

HPV serology measurements will be conducted at the German Cancer Research Center (DKFZ) in Heidelberg using a minimal amount of plasma (100ul). Assays will include the L1, E6 and E7 proteins of all high-risk HPV available at the DKFZ laboratory, i.e. HPV 16, 18, 31, 33, 35, 45, 52 and 58. For HPV 16 this will also include E1, E2, and E4. Several human Polyomavirus types will be included as specificity controls for which no association with cancer is expected.