

RECOMBINANT VIRAL PROTEINS/ONCOPROTEINS FOR THE DEVELOPMENT OF NEW DIAGNOSTIC KITS FOR HUMAN PAPILOMAVIRUS (HPV)- RELATED CANCERS

Innovative aspects and related benefits | The high-risk human papillomaviruses (hR-HPVs) are the etiologic agents of cervical cancer and are associated to anal and oropharyngeal cancers. The over-expression of E6 and E7 oncoproteins is a necessary step toward HPV disease progression and cancer: their direct/indirect detection offers new opportunities to develop tests to distinguish self-resolving HPV infections from infections that are progressing to cancer. Recently, the HPV16 E6 protein has been identified as an early biomarker for HPV-driven cancers, since E6 seropositivity was found to be present more than 10 years before the diagnosis of oropharyngeal cancers. Our goal is the development of simple/rapid/reliable/portable/low-cost diagnostic kits for early detection of HPV-associated cancer.

Use | The HPV E6 protein is extremely difficult to obtain as soluble when expressed in a recombinant form. A new procedure* was set up to obtain a stable, unmutated E6 protein (from HPV-16, -18, -11) in native conditions. The E6 and E7 oncoproteins, together with other recombinant HPV proteins produced in our lab, can be used for the development of new diagnostic kits as well as to get highly specific antibodies that are still lacking in the market.

Activities undertaken and in progress | We have immobilized the HPV E6 and E7 proteins on a prototype chip for detection of serum antibodies in patients ('Biotecnoform' project, 'Sviluppo di metodi diagnostici per l'identificazione di malattie infettive virali ed emergenti'). In 2012, with a collaborative industrial research project 'CHP-Chip proteomico per HPV: ... realizzazione di prototipi di diagnostica avanzata' we won a financial support from FILAS (Finanziaria Laziale di Sviluppo, Prot. N. 1067- CUP F57112000120009). However, this project was not performed due the withdrawn of one industrial partner bought from an Indian company.

*Italian patent n° 1379103 (30/08/2010): Franconi R., & Illiano E. (2007). 'Proteina E6 di HPV ricombinante, solubile e in forma biologicamente attiva, procedimento per la sua preparazione, usi e vaccini terapeutici che la comprendono.'

