culture the pathognomonic Hodgkin- Reed- Sternberg cells in vitro and characterize by molecular techniques, using the micro dissection technique, the nature and origin of these cells as monoclonal germinal- center- derived pre-apoptotic B-lymphocytes that are protected from apoptotic cell kill by numerous mechanisms including mediators and cells of the innate immune system.
Gene expression profiling data have shown that HL cells have a unique signature of specific genes that differ considerably from other B-cell Non Hodgkin Lymphomas and make this lymphoma entity an unique target for new avenues of molecular approaches, using small molecules and antibodies directed against specific transcription factors leading to aberrant cell proliferation, inhibition of apoptotic cell death or constitutive expression of tumor molecules that are absent in the normal cellular counterparts.
There is however no Imatinib for HL and also there is not yet "Philadelphia chromosome" found in HL which drives the malignant process and offers the deadly target for imatinib! There, also, no antibody that acts like Rituximab in NHLs for this HL entity, so doctors depend still mainly on the old chemo- and/or radio- therapies, however, with a very high success rate of curing more than 85−90% of patients with HL in all stages of the disease.

**198** INVITED

**Acute lymphoblastic leukaemia**

D.F. Hoelzer. *Germany*

Abstract not received.

**199** INVITED

**Acute myeloid leukaemia**

A. Burnett, K.I. Mills. *Cardiff University, Department of Haematology, Cardiff, United Kingdom*

Acute myeloid leukaemia is a heterogeneous disease with respect to morphology immunophenotype, cytogenetic abnormalities and mutations that occur. Some of these features have prognostic implications and are increasingly being used to make treatment choices. The balance of these features changes with age. Older patients tend to be characterised by a preponderance of adverse features whereas the opposite is true in younger patients. Biologically it is thought that most cases originate in a cell which is equivalent to the normal haemopoietic pluripotent stem cell, which however may have phenotypic characteristics by which it can be identified.
Gene expression analysis has a number of potential uses in this disease, and a number of questions arise. First, is the signature of the cell population thought to represent the leukaemic stem cell different from the blast cell population which form the bulk of the tumour? Relatively few studies have been done to address this issue but these provide reasonable confidence to suggest that the CD34 positive population is representative of the blast population. Morphological and immunophenotypic criteria have been established in order to diagnose AML. In addition non-random chromosome changes occur in the majority of cases. Careful correlative studies have clearly demonstrated that unsupervised analysis, using robust microarray platforms, such as the Affymetrix Oligonucleotide arrays, can identify the morphologically, immunophenotypically and cytogenetically defined categories with a high (>99%) degree of accuracy. Cytogenetics subclassification is now well established to be predictive of response to all forms of treatment. Expression signature can identify the major prognostic subgroups and in some cases individual karyotype. It can be seen from a diagnostic point of view that all the major information can be provided by DNA microarray technology. This may even be a more qualitatively robust and even cost effective approach. Most of these studies have been conducted as a collaborative approach within the European LeukemiaNET (ELN Work package 13, chaired by T Haferlach). In an international project – the MILE study – microarray characterisation of >2500 cases of all leukaemia subtypes have been completed within 17 defined subgroups. Signatures have been identified which are now being prospectively validated with a view to developing a leukaemia diagnostic chip.
One of the subjective areas of morphology is the distinction of cases that are high risk Myelodysplasia from those that are AML, recognising that the former can often progresses into the latter. Recent evidence suggests that microarray can throw light on this issue and identify patients with an increased risk of transformation.
The concept exists that microarray definition could not only identify existing disease categories, but also define new ones. Further prognostic information is now emerging from the recognition of various mutations within or across the cytogenetic categories. Although it is harder to identify gene expression signatures for these mutations across the leukaemia sub-groups, they can be identified within specific and relevant categories. However, there is much optimism, as yet unfulfilled, that more accurate prognostic information could be provided either to indicate likely disease response to treatment, or indeed prediction of toxicity, with the hope that sensitivity to individual agents can also be identified. This challenge required the characterisation of large numbers of patient's samples – preferably in setting of a standardised approach to treatment. This combined with other molecular approaches of identifying disrupted pathways hold out some hope for future new drug development.

## *Special session* (Thu, 27 Sep, 11:15−12:15)
## Impact of HPV vaccination in oncology in Europe

**200** INVITED

**What is known about HPV natural history? Current trends and variation in incidence, mortality and relation to screening programmes in Europe**

X. Bosch. *Spain*

Abstract not received.

**201** INVITED

**Types of HPV vaccination in the pipeline and dreamed/proven efficacy and effectiveness at short/long term**

C.J.L.M. Meijer. *The Netherlands*

Abstract not received.

**202** INVITED

**Scenarios for application of human papillomavirus vaccination**

S. Franceschi. *International Agency for Research on Cancer, Infections and Cancer Epidemiology Group, Lyon, France*

**Background:** A dozen high-risk types of human papillomavirus (HPV) are recognised to be the necessary, though not sufficient, cause of almost all cervical cancer cases worldwide (approximately 500,000 new diagnoses and 240,000 deaths per year).
Materials, methods and results: HPV 16 and 18 infections alone account for over 70% of invasive cervical cancer (Smith et al., Int J Cancer, 2007), and a fraction of ano-genital cancer and oral cancers. Thus HPV is considered responsible for nearly 5% of cancer in women in developed countries, and this proportion triples when we consider developing countries. The prevalence of HPV in cancer-free women varies substantially from one population to another (2−30% in women 15−64 years of age, Franceschi et al., Int J Cancer, 2006), but it is the most common sexually transmitted infection in most areas of the world.
Although both prophylactic and therapeutic vaccines against HPV are under evaluation, major breakthroughs in the last years have been reported only with respect to prophylactic vaccines. These vaccines have been shown to be safe and highly efficacious in preventing persistent HPV infection (Harper et al., Lancet, 2006), and cervical intraepithelial neoplasia 2 and 3 (Garland et al., N Engl J Med, 2007; FUTURE II Study Group, N Engl J Med, 2007). The main differences between the two products are the HPV types included (i.e., quadrivalent, HPV 6/11/16/18, versus bivalent, HPV 16/18), and the adjuvant used (aluminium or a new ASO4 adjuvant). Some cross protection from the bivalent vaccine has been reported against the relatively common HPV types 31 and 45 (Harper et al., Lancet, 2006). Studies of HPV vaccines have never been done in Africa, and Asia has been only minimally involved. Furthermore, information on duration of protection is limited to 3-to-5 years, and so is the long-term effect in women who have been infected by vaccine types but spontaneously cleared the infection.
**Conclusions:** Full benefits from HPV vaccines will only be possible, however, if mass immunisation campaigns for girls not yet exposed to HPV can be implemented, notably in developing countries, but, at present, the main obstacle is the high cost. Long-term monitoring of HPV vaccination and cervical screening is essential for finding the most effective strategies for cervical cancer control.