2.4. Immunoglobulin heavy/light chain assays

One of the great diagnostic benefits of sFLC analysis is the $\kappa/\lambda$ ratio. This is because: 1) it provides a quantitative assessment of clonality; 2) the clinical ranges are enhanced due to immunosuppression of the non-tumour FLCs; and 3) there is automatic compensation for variable metabolism (Section 3.5). These same advantages can be exploited for intact immunoglobulins if the different light chain types are measured (eg. to produce a ratio of IgG$\kappa$/IgG$\lambda$). Raising polyclonal antibodies specific for the unique, junctional epitopes, spanning the heavy and light chain immunoglobulin constant regions, is a significant challenge but reagents have now been developed for the 3 main immunoglobulins (i.e. IgG$\kappa$, IgG$\lambda$, IgA$\kappa$, IgA$\lambda$, IgM$\kappa$ and IgM$\lambda$) (Chapter 9). Turbidimetric/nephelometric immunoglobulin heavy/light chain (HLC) assays were made available for general use in 2009 – 2010 with the trade name of Hevylite®.

HLC assays typically have a greater clinical sensitivity than SPE (for monoclonal immunoglobulin) and can exceed that of IFE in some instances (Section 18.4). In addition, the assays can be particularly helpful for monitoring patients with IgA myeloma if their monoclonal immunoglobulin co-migrates with other proteins in the $\beta$-region of SPE gels [2]. Preliminary studies have also indicated that suppression of the uninvolved HLC-pair (e.g. IgG$\lambda$ in an IgG$\kappa$ patient) may be more informative than assessment of general immunopaesis and HLC analysis has provide prognostic information in both monoclonal gammopathy of undetermined significance and MM (Chapters 13 and 20). It is too early to judge how valuable HLC assays may be in the management of myeloma and related disorders but, in an editorial, Keren described Hevylite assays as “an important addition to our armamentarium for detecting and quantifying monoclonal proteins” [3].

References