Letters to the Editor

Oestrogen receptor beta: how should we measure this?

V Speirs^{*,1,2}, PJ Carder^{1,2} and MRJ Lansdown^{1,2}

¹Molecular Medicine Unit, Clinical Sciences Building, St James's University Hospital, Leeds LS9 7TF, UK

British Journal of Cancer (2002) 87, 687. doi:10.1038/sj.bjc.6600534 www.bjcancer.com
© 2002 Cancer Research UK

Sir

Since a second oestrogen receptor (ER), ER β was identified in the middle of the 1990s (Mosselman *et al*, 1996), there has been much effort directed into trying to define its biological role in hormone sensitive tissue such as the mammary gland, particularly at the protein level. In a recent issue of *British Journal of Cancer*, Saunders *et al* (2002) reported immunohistochemical detection of ER β in 51 breast tumours. In their study cohort, almost all samples were positive for ER β (48 out of 51; 94%). In an earlier issue of *British Journal of Cancer* (Skliris *et al*, 2001), we too reported immunohistochemical detection of ER β in a similar sized cohort of 63 breast tumours, and showed much less positive nuclear ER β immunoreactivity (48 out of 65; 74%). It is interesting to note that both studies used an identical scoring system, based on assessing both staining intensity (scored 0–3) and percentage positivity (scored 0–5), which generates a numerical score ranging from 0–8 (Allred *et al*, 1998). In both instances, a score of >2 was considered positive.

Why such divergent results in such similar sized cohorts? A Scottish–English patient bias seems unlikely (but has not been excluded!). However, it may be pertinent that each study used monoclonal antibodies directed against different parts of ER β . More recent work from our group has shown a considerable variation in the efficacy of distinct ER β antibodies to detect receptor protein under different applications (Skliris *et al*, 2002) and Saunders also makes this point in her penultimate paragraph, when referring to other published immunohistochemical studies. It is also perhaps important to remind ourselves that the appropriate threshold for scoring a tumour as 'positive' for ER β will remain unclear until immunohistochemical expression can be correlated with endocrine response in the clinical context. ER β may well be an important player in the ER signalling cascade but until there is a recognised consensus on the best way to measure it in a clinically meaningful way, the waters will surely remain muddled.

REFERENCES

- Allred DC, Harvey MJ, Berardo M, Clark GM (1998) Prognostic and predictive factors in breast cancer by immunohistochemical analysis. *Mod Pathol* 11: 155–168
- Mosselman S, Polman J, Dijkema R (1996) ER- β : identification and characterisation of a novel human estrogen receptor. *FEBS Lett* 392: 49–53
- Saunders PTK, Millar MR, Williams K, Macpherson S, Bayne C, O'sullivan C, Anderson TJ, Groome NP, Miller WR (2002) Expression of oestrogen receptor beta (ER β 1) protein in human breast cancer biopsies. *Br J Cancer* 86: 250–256
- Skliris GP, Carder PJ, Lansdown MRJ, Speirs V (2001) Immunohistochemical detection of ER β in breast cancer: towards more detailed receptor profiling? *Br J Cancer* 84: 1095–1098
- Skliris GP, Parkes AT, Limer JL, Burdall SE, Carder PJ, Speirs V (2002) Evaluation of seven oestrogen receptor β antibodies for immunohistochemistry, Western blotting and flow cytometry in human breast tissue. *J Pathol* 197: 155–162

*Correspondence: V Speirs; E-mail: v.speirs@leeds.ac.uk

²On behalf of the Leeds Breast Cancer Research Group, Leeds Teaching Hospitals NHS Trust, Leeds LS9 7TF, UK