Prof. William R Miller

Prof. William R Miller an internationally expert in Oncology is presently working as Emeritus Professor in the University of Edinburgh. He qualified with a B.Sc. (Hons Biochemistry) and Ph.D from the Department of Medicine, University of Leeds. A degree of D.Sc. based on research publications was subsequently awarded by University of Edinburgh. Following positions as Research Fellow, Lecturer and Reader in the Departments of Clinical Surgery and Clinical Oncology, Professor Miller was given a personal chair in Experimental Oncology by the University of Edinburgh in 1993. He was also Honorary Deputy Director, ICRF Medical Oncology Unit, Edinburgh from 1988 to 1997 and acting Head of Department, Department of Clinical Oncology, Western General Hospital, Edinburgh between 1989 and 90.

Professor Miller's research is centred on the endocrinology of breast cancer; studies have primarily focused on human material, using surgically obtained biopsies. He has demonstrated that levels and patterns of oestrogen within the breast, most notably malignant tissue in postmenopausal women, are substantially different from those in the circulation. The potential of human breast cancers to synthesize active steroid hormones from precursors has been investigated. Professor Miller was the first to show unequivocal in vitro oestrogen biosynthesis by breast cancers. Subsequently, in vivo infusion studies confirmed that breast cancers have the potential for both active uptake and local biosynthesis of oestrogens and that the contribution of the processes to endogenous oestrogen levels varies between different tumors. More recent investigations have been concerned with determining the physiological and clinical significance of local oestrogen synthesis within the breast. It was shown that oestrogen synthesis in adipose tissue is higher in (i) tissue derived from breasts bearing malignant tumors compared with those having benign conditions and (ii) in the local area of malignancy. These and other results

suggest that paracrine factors from breast cancers may induce aromatase in adjacent adipose tissue. Professor Miller has used these in vitro and in vivo systems to evaluate the utility and therapeutic potential of novel drugs as inhibitors of aromatase. His findings have been central to the development of the third generation aromatase inhibitors, which are now being used as first-line endocrine therapy for breast cancer. Professor Miller has also been a leading advocate of using neo-adjuvant research protocols to monitor response to treatment of primary breast cancers. Tumor material obtained by sequential core biopsies before and during treatment may be used to (i) identify markers which might predict response to treatment and (ii) monitor molecular and histo-pathological changes associated with response or resistance to therapy. This knowledge has been used to elucidate mechanisms of resistance and rationalize treatment.

This research has resulted in over 300 scientific papers in peer- reviewed journals. Professor Miller has been invited to give papers on his work at over 200 international/ national meetings. He has also been Chairman for over 50 sessions in international/national meetings. He has acted as referee and reviewed grant submissions from over 20 research organizations

Additionally, Professor Miller has served on many research committees and organizations. He was Honorary Secretary of the British Association of Cancer Research from 1993 – 1995, Chairman of the British Breast Group and Chairman of the Scientific Advisory Board for the Breast Cancer Campaign. He is/was on the editorial board of 8 scientific journals.

Prof. Miller has a major interest in the profiles of steroid hormones within breast fluids (nipple aspirates and cyst fluids) and tissues (cancers, normal parenchyma and fat). These studies are aimed at monitoring the environment of the non-pregnant "resting" breast by measuring their hormone content. He was the first to show that both nipple aspirates and cyst fluids contain remarkably high levels of dehydroepiandrosterone (DHA) sulphate, other related C19 steroids and oestrogen conjugates and that these differ significantly between the major sub-populations of cysts as defined by electrolyte composition and histology of the lining epithelium. Infusion studies have also shown active uptake of 3H DHA sulphate into cyst fluids with values being up to 15 x higher than those in the circulation uptake being restricted to type I cysts. Follow-up of patients has demonstrated the radioactivity may be detected in cyst fluids up to two years following infusion. Parallel studies are being performed with 3H oestrone sulphate and preliminary results suggest uptake but at a much-reduced level compared with DHA sulphate.