

## GROWTH IMPAIRMENT OF HUMAN CELLS BY FERN SPORE EXTRACTS

S.E. SIMÁN & E. SHEFFIELD\*

Faculty of Life Sciences, G30B Stopford Building, University of Manchester, Oxford  
Road, M13 9PL.UK

\* author for correspondence (Email: L.Sheffield@manchester.ac.uk)

### INTRODUCTION

Our review of the literature (Simán *et al.* 1999) posed a question – are there human health risks from fern spores?. Our conclusion was that there may be. Carcinogenesis in humans caused by tissues of ferns is well established (e.g. Alonso-Amelot & Avendaño, 2002) and spores of some ferns cause allergic reactions and contact dermatitis in some people. We first obtained evidence for DNA-damage and carcinogenicity from experiments with spores of a single species (*Pteridium aquilinum* - bracken) fed to mice. Similar experiments have since established that spores of five fern taxa (including northern and southern hemisphere bracken) induce DNA adducts in upper gastrointestinal tissue of mice (Simán *et al.* 2000a).

Experimental administration of spores to whole humans is not practical, but experiments with human cells strengthen the conclusion that fern spores can cause DNA damage. Administration of extracts of spores of *Dicksonia antarctica*, *Pteris vittata*, *Sadleria pallida*, *Anemia phyllitidis* and *Pteridium aquilinum* to human premyeloid leukaemia cells induces breaks in their genomic DNA (Simán *et al.* 2000b). DNA damage is strongly correlated with carcinogenic events (e.g. Fairbairn *et al.* 1995) but even if such damage was caused in whole humans after inhalation or ingestion of spores, it is of course possible that repair mechanisms would mend the breaks before tumourigenesis was triggered.

The aim of the research reported here was to establish whether fern spore extracts prevent the growth and proliferation of human cells.