**THE LIVER GROUP**

**CHAIRMAN'S REPORT**
**IN RESPECT OF THE ACCOUNTS**
**FOR THE YEAR ENDING 31 DECEMBER 2006**

We follow two paths to develop the bio-artificial liver – but unlike parallel lines the two will converge! There is this 'software' of the system, the cellular component, and the 'hardware'- the bio-reactor that will house those cells and will be connected in due course to the patient with liver failure. Both sides have seen significant progress in the last year.

The software – alginate encapsulated cells – is based, as those who follow our work will know, on proliferating cell lines, which are excellent for providing the required number of cells to treat a patient (200 billion, approximately 33% of the normal number in the liver), but which lack some enzymes for full function. One particular and vital part of the liver's repertoire, missing in the cells we use, is the ability to dispose of the toxic compound ammonia that is generated in the body; we have analysed the nature of the missing enzymes (which like much in science was more complex than first appeared) and now successfully corrected the defect in the cells by gene transfer.

On the hardware side our bio-reactor, developed in concert with collaborators in France, has now reached prototype form, with a machine in which cells are suspended as a 'floating bed'. The cells are suspended with plasma passing past them and thus have the best chance both to receive nutrients and to process the diseased plasma that passes. We have enlisted other collaborators, for example from the Institute of Orthopaedics in University College, taking advantage of their bioengineering expertise. We have been able to demonstrate excellent function of our cell lines in the fluidised bed reactor, even in the hostile milieu of plasma from patients with liver failure.

We are now adapting the hardware so that cells in it can be readily frozen and thawed - necessary as the apparatus must be available 'when required' in a transportable form. To enable the bio-artificial liver to be developed as a clinical entity, we have with the help of UCL Biomedica (part of University College) put the appropriate markers down to protect the intellectual property that has been developed.

This year has been one of significant scientific progress, with important contributions to the scientific literature, but more importantly solid moves towards creating clinical reality. We look forward to a productive and exciting next year. As always we are immensely grateful to our supporters, without whom this work would not be possible.

Humphrey Hodgson *FRCP, F Med Sci*
Chairman