Queen Victoria Hospital NHS
NHS Foundation Trust

STEM CELL TRANSPLANTATION FACT SHEET

March 2007

– CORNEO PLASTIC UNIT & EYE BANK,
– BLOND McINDOE RESEARCH CENTRE

QUEEN VICTORIA HOSPITAL NHS FOUNDATION TRUST, EAST GRINSTEAD, WEST SUSSEX, RH19 3DZ

INTRODUCTION

Since 2000, through close collaboration the Blond McIndoe Research Centre, Corneo Plastic Unit and Eye Bank have been performing Ex-vivo (laboratory cultured) stem cell transplantation. The project was performed under ethics approval. We recently published our earlier results which were very encouraging and the procedure is now offered on the NHS.

WHAT DID WE DO?

The Blond McIndoe Research Centre used donor rims (the remaining eye tissue) discarded following corneal transplantation and cultured sheets of stem cells using samples from the limbus (the area where the white portion of the eye meets the cornea and location of stem cells). These sheets were transplanted to suitable recipients who had STEM CELL DEFICIENCY as a result of injury or congenital (inherited from birth) deficiency. The sheets were secured using amniotic membrane (protective lining that surrounds babies while developing in the womb).

WHAT DID WE FIND?

Our work is not unique and similar ex-vivo transplantation is performed at other centres in Italy, Japan, Taiwan, USA and more recently India. Seven of our first 10 patients (70%) had an improvement in the condition of their ocular surface. That is not to say the surfaces completely normalised. Patients did improve over time and after between 5 and 18 months some had to have corneal grafts to rehabilitate vision. The “breakthrough” that has been generated from our group relates to DNA fingerprinting findings on our patients who have had successful restoration of their ocular surfaces. We found that there was no donor DNA on the surfaces of the eye, which suggests that the patient’s own body has played a part in restoration of the surface and continues to maintain a normal surface. This has TWO implications 1) there is no need for long-term immune suppression (strong anti-rejection drugs) and 2) these findings may play a part in regeneration of tissue elsewhere, an area that needs further investigation by our colleagues in other fields.

IS THIS TREATMENT AVAILABLE TO NHS PATIENTS?

Yes - this is an NHS development and by the complex nature of the diseases involved, patients are typically treated in a specialty centre within the NHS.

WHO CAN BE TREATED?
Only those with problems involving the EYE SURFACE in particular those patients who have LIMBAL STEM CELL DEFICIENCY. These include those who have had chemical (acid or alkali), thermal injuries or Stevens Johnsons Syndrome, which have resulted in damage to the limbus. There are also a group of patients who have congenital deficiency of stem cells, including those with Aniridia and ectodermal dysplasia.

WHO CANNOT BE TREATED by ex-vivo stem cell transplantation?
Eye problems that do not involve the eye surface and cornea.

Examples of conditions that CANNOT be treated include:

Age related macular degeneration
Retinitis pigmentosa
Optic neuritis and other problems of the optic nerve
Severe eye injuries involving the retina (back of the eye)
Keratoconus
Fuchs corneal dystrophy