**ABSTRACT**

Improvements in clinical outcomes led to the hypothesis that ELAD treatment stimulates recovery and regeneration of hepatocytes in subjects with Acute Liver Failure. To gain an understanding of what facets of C3A cell function contribute to this phenomenon, subjects' blood and the plasma ultrafiltrate into (“UF IN”) and out (“UF OUT”) of the ELAD cell circuit at distinct time points were assayed for proteins and metabolites during ELAD treatment.

**METHODS**

The ELAD System recirculates ultrafiltrated plasma from subjects' blood through the cell cartridges, which is then combined with the whole blood returning to the subject. The System is operated continuously for up to five days and the C3A cells monitored for oxygen and glucose consumption at prespecified time points during the treatment period. Samples are taken from the subjects' blood and ultrafiltrate prior to and after cell exposure during ELAD treatment. Data from one example Alcohol-Induced Liver Decompensation (AILD) subject for whom there are matching samples of blood and ultrafiltrate are shown in the Results.

**RESULTS**

ELAD Subject

- Gelsolin
- C3 Complement
- Factor V
- a-Fetoprotein

**DISCUSSION**

Protein production by ELAD cell cartridges is shown by increased levels of trackable proteins in the returning ultrafiltrate (“UF OUT”) as compared to ultrafiltrate entering the ELAD cell circuit (“UF IN”). This may contribute to increased blood protein concentrations in subjects during ELAD treatment. Due to the high flow rate through the ELAD cell circuit (“UF Pump” in the ELAD System Schematic, 30-60 mL/min), it is only possible to detect UF differences in proteins manufactured in high abundance by the C3A cells (e.g. a-fetoprotein [AFP], Gelsolin, C3 Complement), which match increases in blood levels of these proteins during ELAD treatment. Cumulative production of low abundance proteins (e.g. Factor V) can be observed in increased blood levels but not in UF differences. Gelsolin, C3 complement, Factor V and AFP blood levels are observed to fall 24 hours post ELAD treatment in this example subject. Oxygen and glucose consumption rates of the ELAD cell cartridges for this example subject are also shown. Coupled with the histology and electron microscopy findings, these observations suggest that the C3A cells in the ELAD System maintain viability through the ELAD treatment and may contribute significantly to circulating proteins levels in treated subjects.

The ELAD System has not been demonstrated to be safe or effective for any indication and is not available for sale in the United States or any other country. CAUTION: Investigational New Drug. Limited by Federal (or United States) law to investigational uses.