# ReNeuron

2021 INTERIM RESULTS AND BUSINESS UPDATE

30 November 2021

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## **SUMMARY**

- A leader in Stem Cell and Exosomes Technologies
- Lead programme targeting the treatment of retinitis pigmentosa (RP)
  - Encouraging early Phase 2a clinical data with study ongoing
  - Early data from the extension study expected in late Q1 2022
- Expanding proprietary Exosomes platform in a growing market
  - 7 early stage collaborations ongoing with Big pharma, biotech and academic institutions
- Well-funded with cash at 30 Sept 21 of £17.4m
  - Providing at least a 12-month runway

## STRATEGY LEVERAGING OUR STEM CELL EXPERTISE

#### **OUR PRODUCTS**

#### **OUR PLATFORMS**



#### **Lead Programme - hRPC**

Phase 2a Development



CTX

#### hRPC programme

- Allogeneic stem cell based therapeutic approach to inherited retinal diseases
- Favorable commercial characteristics vs competition: Successfully manufactured at scale and with a cryopreserved formulation
- Encouraging early Phase 2a data in ongoing Retinitis Pigmentosa trial

**CTX Programme:** Currently under evaluation in stoke disability. Out licenced strategy and partnered with Fosun in China



#### **Lead Platform - Exosomes**

7 Partner Collaborations



#### **Exosomes platform**

- Delivery mechanism for variety of payloads such a siRNA, mRNA, proteins, small molecules and genes.
- Growing number of Partner Collaborations with Big Pharma, Biotech and Academics in a fast expanding area of scientific and commercial interest
- Key advantage of ReNeuron's stem cell derived Exosomes delivery technology is the ability to tissue match the exosome with the target tissue type

**iPSCs platform:** Under investigation in allogeneic CAR-T / CAR-NK cell therapies. Also offers the ability to further expand the tissue targeting of the Exosomes platform







**hRPC** 

## LEAD PRODUCT & PLATFORM HIGHLIGHTS: H1 2021

- Continued progress in the Phase 2a clinical trial evaluation for treatment of Retinitis Pigmentosa
- In June enrolment into the higher dose phase 2a extension study was temporarily suspended due to a presumed case of bacterial intraocular infection
- Following a completed investigation, and with Data and Safety Monitoring Board approval, by October the study was reopened in all geographies
- First patient post lifting of the suspension was treated in mid October with early data from the extension study expected in late Q1 2022



**Exosome Platform** 

- A total of seven collaborations now proceeding with Global Pharma, Biotech and academic institutions
- Increased interest seen in the field of Exosomes as a delivery mechanism for a variety of payloads
- New data produced providing clear pre-clinical proof-of-concept that ReNeuron's Exosomes drug delivery technology can effectively deliver therapeutic proteins to the brain to potentially treat important neurological diseases
- The Group expects to gather further proof-of-concept data and expand the number of partner collaborations in the coming 12 months



Other

**Operational** 

**Highlights** 

## OTHER OPERATIONAL HIGHLIGHTS: H1 2021

- Collaboration signed with University College London ('UCL') investigating the use of ReNeuron's induced pluripotent stem cell ('iPSC') platform to potentially generate CAR-T and/or CAR-NK cells
- Positive data from a separate UCL collaboration demonstrating that ReNeuron's iPSCs can be differentiated into Schwann cells with potential applications such as peripheral nerve damage repair
- Fosun continues to progress the development of CTX in stroke disability in China



Board and Mgmt. changes

- In July, Iain Ross was appointed as Non-Executive Chairman with Dr Tim Corn stepping down but continuing to serve as Non-Executive director. Additionally, Barbara Staehelin joined the board as Senior Independent Non-Executive Director
- In May Dr Stefano Pluchino joined the executive team as Chief Scientific Officer
- Post period end in October 2021, Catherine Isted, ACMA, joined the Board, replacing Michael Hunt as Chief Financial Officer
- In October 2021, following nearly nine years of service to the board, Professor Sir Chris Evans OBE stood down as a Non-Executive Director, remaining as an adviser to the Board

## FINANCIAL HIGHLIGHTS – H1 2021





**Financial** 

- Revenue for the period was £58k relating to Royalty income (H1 2020: £41k)
- Loss for the period of £5.2 million (H1 2020: loss of £7.1 million) driven by lower costs
- Costs incurred in the period were £6.1 million (H1 2020: £7.9 million)
  - R&D was £4.3 million (H1 2020: £5.9 million) a decline of £1.6 million following the decision to not progress the stoke disability programme internally and focus resources on the Company's RP programme and Exosomes/iPSC platforms
  - G&A expenses declined in the period to £1.8 million (H1 2020: £1.9 million).
- Increased net cash used in operating activities of £4.6 million (2020: £2.6 million; 2020 benefitted from a £2.9m R&D tax credit receipt)
- Cash, cash equivalents and bank deposits at 30 September 2021 of £17.4 million (31 March 2021: £22.2 million) providing at least a 12 month runway



# TARGETED DELIVERY PLATFORM FOR NEXT WAVE OF PRECISION MEDICINES



Nano-scale vesicles released by most cell types as a means of intercellular communication



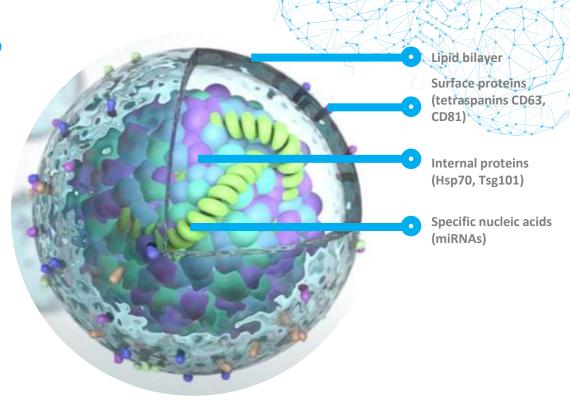
Proven ability as a delivery vector for loading nucleic acids (including miRNAs, siRNAs and plasmid DNA); and biologically active proteins/peptides (including CRISPR/Cas 9 proteins)



ReNeuron's brain, retinal and iPSC-derived Exosomes represent a world-leading repertoire of assets with potential applications in a diverse range of therapeutic indications

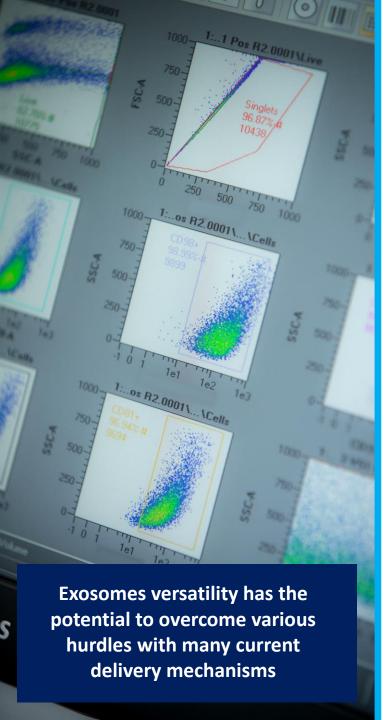


Internal expertise for the end-to-end processing capabilities, from production of cells to isolation of Exosomes and characterization



Increasing interest in Exosomes as delivery vector for next wave of precision medicines





# EXOSOMES: THE NEW GENERATION DELIVERY TECHNOLOGY

#### Able to carry a wide range of payloads

- ✓ siRNA
- ✓ mRNA
- ✓ Soluble protein
- ✓ Membrane-assoc. protein
- ✓ Small molecules
- √ Genes (ExoAAV)

#### Tissue targeting / Tissue Specificity

- ReNeuron has potential to match exosome cell lines with target tissue (tissue matching)
- ✓ Use of external loading to further assist in targeting correct tissue.

#### Multiplex payload

- ✓ Able to carry 2+ payloads
- ✓ Payloads can be carried internally and/or externally

#### Utility and Safety profile

- √ No pre-existing immunity and ability to re-dose
- ✓ Good safety profile

# EXOSOMES: RENEURON GROWING IN A GROWING MARKET

- The Therapeutic Exosomes field is expanding quickly, growing significantly in recent years
- ReNeuron's number of partners has grown from two to seven in last 3 years
- Right Place, Right Time, Right Technology

Evox / Takeda
Total \$0.8B

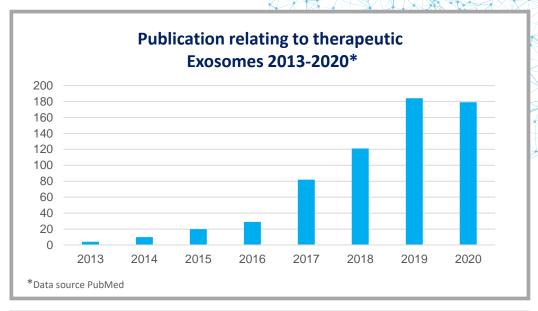
Codiak / Jazz
Total \$1B

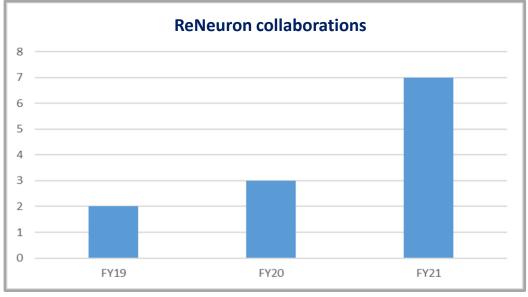
Evox / Lilly

**Total \$1.2B** 

neurological targets

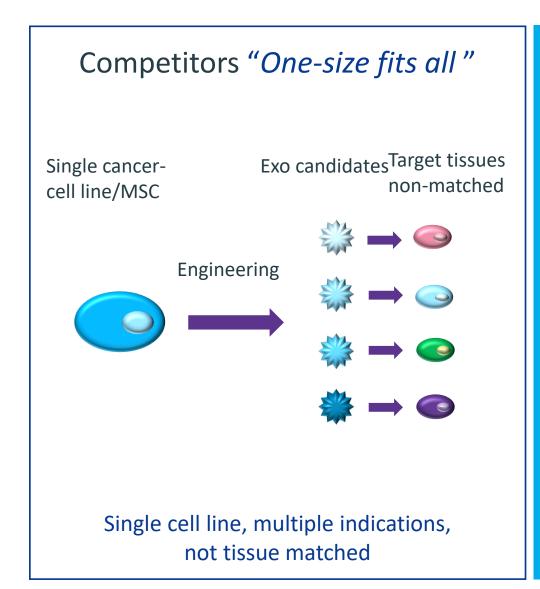
Increasing industry interest and hence commercial value of Exosome deals

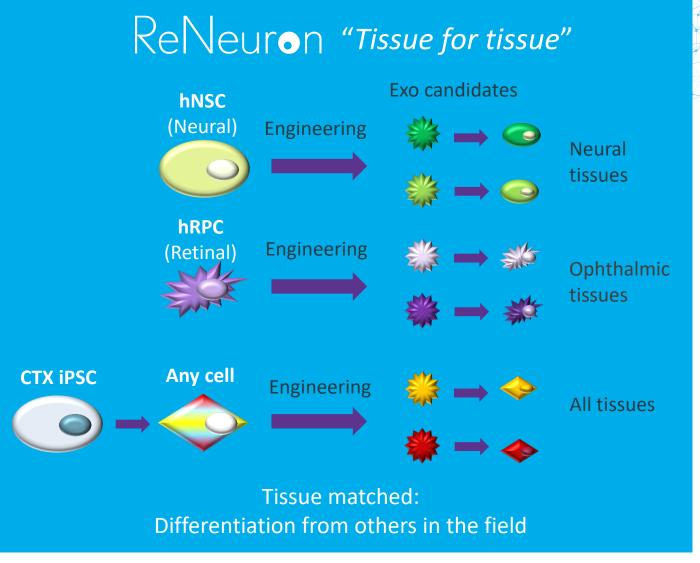






# THE RENEURON ADVANTAGE: TISSUE FOR TISSUE MATCHING







# Three Proprietary Assets within our Exosome platform





Human neural stem cell Exosomes (hNSC)

Producer stem cell lines from three distinct brain areas

Cortex (CTX), Striatal (STR) and Hippocampal (HPP)

Conditionally immortalized for stable and scalable production

**GMP-compliant source stocks** 



Human retinal stem cell exosomes (hRPC)

Exosome production confirmed with distinct profile

Exosomes generated from GMP manufactured hPRC cell banks

Potentially providing superior exosomes profile to treat a wide range of diseases of the eye



Inducible pluripotent stem cellderived Exosomes (CTX-iPSC)

CTX-derived induced pluripotent stem cell platform

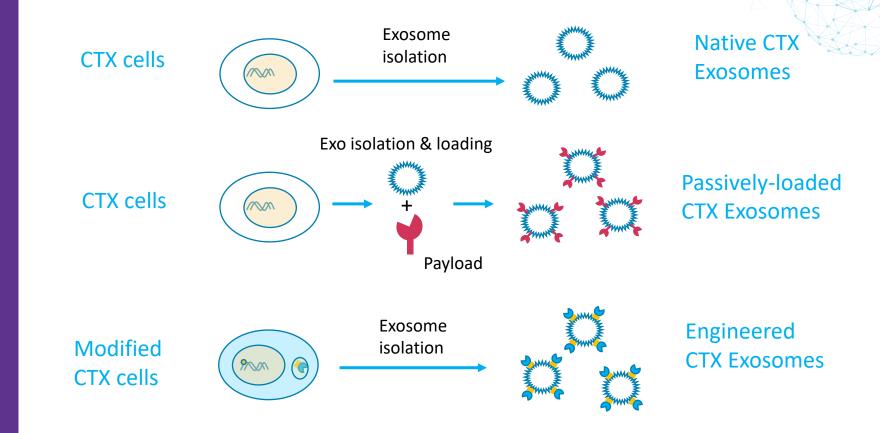
Has the potential to produce unique lineage specific Exosomes

Opens the opportunity for new targeted cell therapeutics extending to all tissue types

An exciting repertoire of assets with potential in many diverse therapeutic areas

# ABILITY TO PRODUCE NATIVE, PASSIVELY-LOADED AND ENGINEERED EXOSOMES

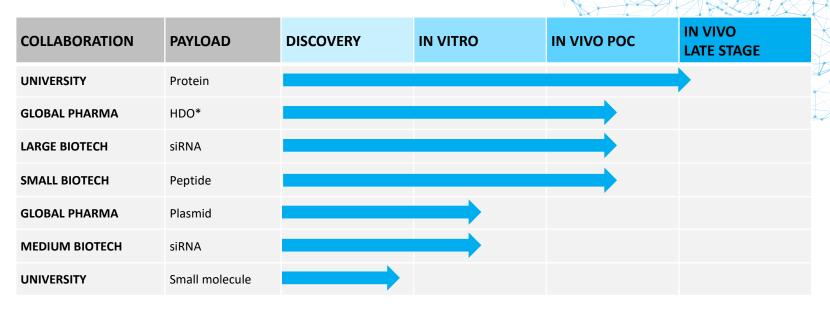
# Ability to produce Native, Passively-loaded and Engineered Exosomes



Providing an expanded range of Exosomes products

# EXOSOMES PARTNER AND OWN PROGRAMME PIPELINE

#### **Exosomes Collaborations with Partners**



## **Internal Programmes**

PROGRAMME	PAYLOAD	DISCOVERY	IN VITRO	IN VIVO POC	IN VIVO LATE STAGE
Exo-miR	miRNA				
EXO-GF	Growth Factor				
EXO-Cas	CRISPR gene-edit				

<sup>\*</sup>HDO: heteroduplex oligonucleotide

# DELIVERY OF THERAPEUTIC PROTEINS WITH RENEURON'S EXOSOMES

We believe this is the first time that a potentially therapeutic protein payload has been delivered to the brain using Exosomes\*

- Delivered by Intrathecal injection (lumbar puncture)
- Response observed only with Exosomes loaded with therapeutic protein
- This area of the brain (the striatum) is affected in Parkinson's and Huntington's disease
- Exosomes have potential to transform effective drug delivery for key neurological diseases
- Patent filed Oct 2021

#### **NEXT STEPS**

- Perform functional studies to demonstrate clinical potential
- Planning to conduct in vitro functional studies in a variety of indications
- In vivo functional studies will follow for the most promising indications

\*In a preclinical setting



<sup>\*\*</sup> \*\* % Target gene expression levels relative to reference gene \*\* 350 300 250 200 150 · 100 50



### RETINITIS PIGMENTOSA: AN UNMET NEED



RP is an inherited, degenerative eye disease<sup>1,2,3</sup>

- Incidence of 1:4,000 in U.S. and worldwide
- Incredibly difficult condition to treat



Treatment available only for patients with a single gene defect (RPE65)



>100 genes identified containing mutations leading to RP<sup>4</sup>



Patients with all other types of RP (c.98% of patients<sup>5</sup>) have declining vision eventually leading to severe visual disability in most

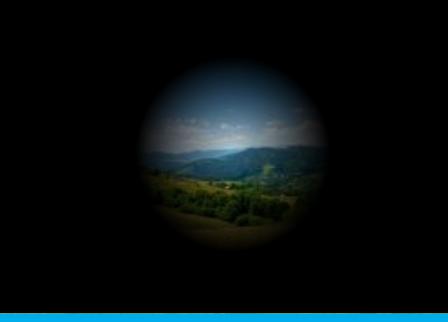
#### Therapeutic benefit of hRPC approach independent of genetic cause

<sup>&</sup>lt;sup>3</sup> NORD





Normal View



<sup>&</sup>lt;sup>1</sup> Hamel (2006) Orphanet J Rare Disease 1, 40;

<sup>&</sup>lt;sup>2</sup> https://nei.nih.gov/health/pigmentosa/pigmentosa\_facts;

<sup>&</sup>lt;sup>4</sup> https://www.genome.gov/13514348/learning-about-retinitis-pigmentosa/ <sup>5</sup> www.nice.org.uk/guidance/hst11/chapter/2-The-condition

# **HUMAN RETINAL PROGENITOR CELLS (hRPC)**







hRPC: allogeneic cell-based therapeutic approach to retinal disease

Proprietary manufacturing process and controls allow for stable, high quality and high quantity GMP production

**High commercial potential** 

hRPCs differentiate into functional photoreceptors and integrate into retinal layers in pre-clinical models; integration may also enable durable trophic support

Broad potential across a range of eye diseases, initially targeting inherited retinal degenerative diseases

Orphan Drug Designation in EU and US in RP and FDA Fast Track Designation

Collaborations with Schepens Eye Research Institute (Harvard) and University College London

Proprietary technology enabled development of GMP manufacturing process

Cryopreserved formulation provides ninemonth shelf life and enables local treatment worldwide RP is a large orphan market.

Attractive pricing precedent set by Luxturna

Mechanism of action independent of genetic cause

Commercially viable formulation



#### PHASE 2a EFFICACY STUDY

#### Study Design:

10 subjects with established RP, Patients with better visual potential, 1m cell dose

#### O Primary endpoint:

Safety

#### Secondary measures:

Visual acuity, visual field, retinal sensitivity and retinal structure

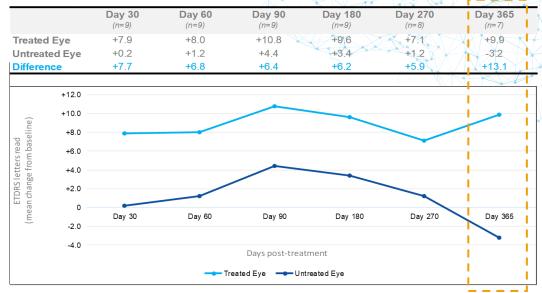
#### Outcome:

**Established Efficacy signal and continued safety** 

**Additional Notes:** Excluding 1 patient (6003) with surgery-related vision loss. Some patient visits have not completed due to Covid-19

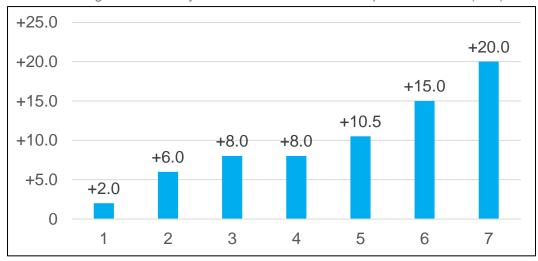
#### Mean changes in ETDRS letters read

(treated eye vs untreated eye)



#### Individual patient improvements at 12 months;

ETDRS change in treated eye from baseline 12 months post-treatment (n=7)





# CLINICAL DEVELOPMENT: PHASE 2a EXTENSION

Modifications to build on initial efficacy signal

#### **Phase 2a Extension**

#### 9 additional subjects with established RP

- Dose escalation: from 1m to 2m cells
- Require ability to perform micro-perimetry should allow retinal sensitivity to be an indicator of efficacy
- Additional baseline VAs to ensure patient reliability
- Modified surgical technique to target bleb placement: injection sites chosen to avoid areas of viable retina

#### O Primary endpoint

Safety

#### Secondary measures

 Visual acuity, micro-perimetry, visual field, retinal sensitivity and retinal structure

#### **Current Status**

#### Recruit remaining subjects in high dose extension study

- Enhancements in subject selection, dose, surgical technique and efficacy assessments
- All sites reopened
- Looking to enrol remaining subjects by year end 2021
- Further efficacy data expected to be available in late Q1 2022

#### **Next steps**

#### Analysis of data from extension study will inform:

- Optimal dosing: Based on efficacy/safety profile
- Commercial profile: Is sub-retinal delivery providing target efficacy and duration of action?
- A decision as to whether data supports:
  - a move straight to a pivotal trial
  - additional subjects to garner further sub-retinal data
  - a move into the clinic with an intravitreal dosing regimen
- Potential partnering/out-licensing strategy





#### UCL



iPSC Platform

## IPSC PLATFORM & CTX IN STROKE DISABILITY

- ReNeuron's induced pluripotent stem cell (iPSC) platform technology can reprogramme proprietary neural stem cells into a pluripotent state able to differentiate into any other form of cell
- iPSCs retain the immortalisation characteristic of the stem cells from which they are derived, resulting in highly stable cell lines
- Technology has the potential to lead to off the shelf therapeutics
- Also has the potential to produce exosomes with tissue-specific targeting ability
- Collaborations with University College London investigating potential use of CTX-iPSC cell lines to generate CAR-T / CAR-NK cells and separately the ability to differentiate into Schwann cells for potential use in peripheral nerve damage repair.

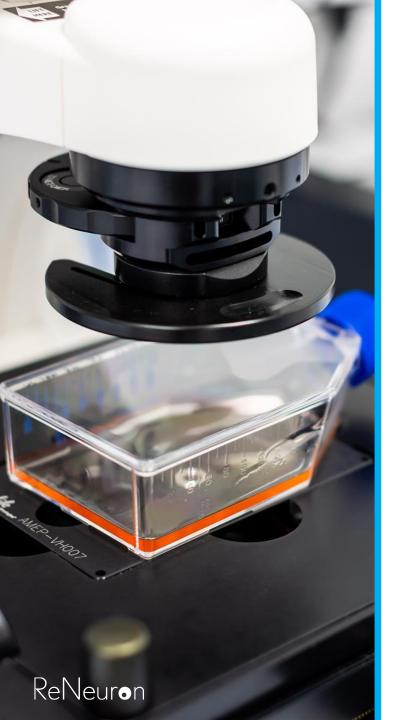
#### FOSUN复星



CTX Cells

- Immortalised neural progenitor stem cell line
- Positive clinical data in stroke disability. Potential in Huntington's disease, TBI and other indications
- Out-licensing strategy
- Partnered with Fosun Pharma for China





## **SUMMARY: THE OPPORTUNITY**

- EXOSOMES Right place, Right time, Right Technology
  - Accelerated investment to build IP and know-how in the Exosomes field
  - Strengthen and progress our existing partnerships
  - Establish new value creating industry partnerships
  - Maximize the potential for ReNeuron in this fast growing area of Science
- hRPC Potential to create near-term value
  - Further data from expanded Phase 2a study of hRPC in RP
  - Data to determine appropriate next steps
- Potential longer-term upside: iPSC platform and CTX Stroke disability
  - iPSC Platform earlier stage but with exciting potential in multiple areas
  - CTX in stoke disability progressing with Fosun in China

A leader in Stem Cell and Exosomes Technologies

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Ticker: RENE.





# INTERIM RESULTS

## Highlights

for the six months ended 30 September 2021

(£'m)	Six months ended 30 September 2021	Six months ended 30 September 2020
Revenue and other operating income	0.1	0.1
Research and development costs	(4.3)	(5.9)
General and administrative costs	(1.8)	(1.9)
Operating loss	(6.0)	(7.7)
Net finance income/(expense)	0.1	(0.2)
Taxation	0.7	0.9
Loss for the year	(5.2)	(7.1)

# SUMMARY BALANCE SHEET

(£'m)	30 September 2021	30 September 2020
Non-current assets	0.9	1.0
Current assets (excluding cash & bank deposits)	3.1	4.6
Cash and bank deposits	17.4	9.8
Total assets	21.4	15.4
Total liabilities	(7.3)	(8.8)
Net assets	14.1	6.6
Share capital	0.6	0.3
Share premium	113.9	97.9
Other reserves	42.5	42.5
Accumulated losses	(142.9)	(134.1)
Total equity	14.1	6.6

# SUMMARY CASH FLOW

(NON-STATUTORY FORMAT)

(£'m)	Six months ended 30 September 2021	Six months ended 30 September 2020
Cash flows from operating activities	(4.6)	(5.5)
R&D tax credit received	-	2.9*
Net cash used in operating activities	(4.6)	(2.6)
Capital expenditure	(0.2)	-
Proceeds from issue of shares (net of costs)	-	-
Lease payments	(0.1)	(0.1)
Net (decrease)/increase in cash & bank deposits	(4.9)	(2.6)
Effect of foreign exchange rates	0.1	(0.2)
Cash at start of period	22.2	12.6
Total cash and bank deposits at end of period	17.4	9.8

<sup>\*</sup> Includes £2.9 million relating to the year ended 31 March 2019

# EXOSOMES: COMPARISON OF DELIVERY TECHNOLOGIES

	Lipid nanoparticles	Lentivirus	AAVs	Exosomes
Gene delivery in vivo	++	+++	+++	+++ (ExoAAV)
Safety profile	+	++	++	+++
Max payload size	+++	++	+	++
Pre-existing immunity	+++	+++	-	+++
Repeat-dose immunity	+	+	-	+++
Permanent effect	-	+++	+	+
Multiplex payload delivery (2+ payloads)	++	++	-	+++
Ease of manufacture	+++	+	++	++
Tissue targeting	+ (mainly liver)	+	+	+++*
Tissue specificity	-	-	-	+++*
Payload presentation	Internal	Internal	Internal	Internal & external
Payload repertoire	siRNA mRNA Soluble protein Small molecules Genes	Genes	Genes	siRNA mRNA Soluble protein Membrane-assoc. protein Small molecules Genes (ExoAAV)

<sup>\*</sup> ReNeuron predicts an comparative advantage in these areas by matching exosome source with target tissue

Exosome Key Advantages: Range of payloads, Tissue targeting, Multiplexed delivery, Redosing possible, Safety profile

#### **UCL**

# CAR-T CAR-NK

**iPSC Platform** 

#### **UCL**



## IPSC COLLABORATIONS WITH UNIVERSITY COLLEGE LONDON

- Collaboration with Dr. Claire Roddie, UCL
- ReNeuron to provide iPSCs from its CTX immortalised Neural progenitor cell line, which is available as clinical grade material
- o UCL to assess for their ability to differentiate into functional T cells and natural Killer ('NK') cells
- o If successful, the CTX-iPSC cell lines will be used to generate chimeric antigen ('CAR') T cells and/or CAR-NK cells

Dr. Clare Roddie said: "We are excited to work with ReNeuron to develop universal CAR approaches using their clinical grade CTX-iPSC lines. If preclinical testing is successful, we would hope to move towards clinical studies."

#### Collaboration with Prof. James Philips and Dr. Rebecca Powell, UCL

- hiPSCs can be differentiated into Schwann cells via an intermediate Schwann cell precursor stage
- hiPSCs were reprogrammed from ReNeuron's clinical grade CTX neural progenitor line, which benefits from conditional immortalisation (CI)
  - Hence, once terminally differentiated, the cells will only divide in the presence of a synthetic molecule that is not present in the body, reducing the risk of tumour formation
  - The CI technology also appears to promote mature Schwann cell viability