# **Advanced Filtration Technology**

CORPORATE PRESENTATION | NOVEMBER 2020

# Strategic Investment in CelluAir

- Nanollose has made a \$200,000 strategic investment to acquire a 20% holding in CelluAir, an Australian company developing an Advanced Filtration Technology ("AFT") based on nanocellulose.
- Developed by Queensland University of Technology, the AFT has been developed and validated over a number of years, culminating in the filing of a patent application in July 2020.
- Capital from the Investment will be used to scale the AFT using off-the-shelf commercial equipment, in addition to commencing discussions with potential sales partners and distribution channels in Australia and internationally.
- The Investment potentially enables Nanollose to enter the high growth personal protective equipment market, within which the face mask sector alone has reached US\$11b in 2020, with strong growth forecast<sup>1</sup>.
- Initial testing by QUT has demonstrated the AFT to be potentially more effective than traditional N95 face mask filtration technology.
- The AFT and CelluAir are being incubated by Innovyz, the commercialisation specialists responsible for developing and listing of Titomic Limited (ASX:TTT) and Amaero International Limited (ASX:3DA).
- Strong working synergies exist between the companies, with the opportunity for Nanollose to supply microbial cellulose and expertise in nanocellulose to CelluAir, assisting in the commercialisation of the technology.

<sup>1</sup>https://www.prnewswire.com/news-releases/face-mask-market-size-to-reach-revenues-of-over-20-billion-by-2025--arizton-301096977.html



QUT

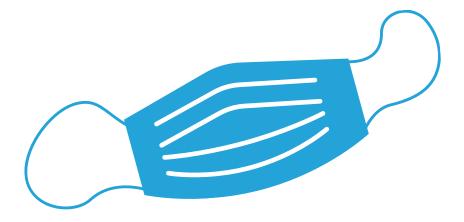
the university for the real world

AFT was developed the Queensland University of Technology

### A Global Challenge

### SHORTAGE OF MEDICAL FACE MASKS

A current shortage of surgical face masks exists, with an N95 mask shortage predicted to occur on 24 January 2020 with a daily face mask shortage of 2.2 million. Face mask wear is expected to continue after the pandemic with changed behaviour and attitudes towards health and hygiene.



With a "Shortage of personal protective equipment endangering health workers worldwide, WHO calls on industry and governments to increase manufacturing by 40 per cent to meet rising global demand". THE WORLD HEALTH ORGANISATION | MARCH 2020



# A Global Challenge

### **CAUSE OF SHORTAGE**

China is the major face mask producer in the world, contributing to 50% of the global production.

Normally, China can produce about 20 million face masks per day, while the productivity during the Chinese New Year holiday was lower (12 million face masks per day).

Even if full productivity could be achieved, 20 million face masks per day would not meet the needs of a population of 1.4billion in China under a universal face mask wearing policy, let alone the rest of the global population. Off shore manufacturing over many years has left the majority of countries (including Australia) without supply chain security or domestic manufacturing.

All countries rely on petrochemical materials used in the production of facemasks with a few countries bottlenecking supply.

Sources:

https://www.sciencedirect.com/science/article/pii/S2589537020300730 Ministry of Industry and Information Technology of People's Republic of China. Facemasks shortage? http://www.miit.gov.cn/n973401/n7647394/n7647409/c7656383/content.html https://www.who.int/news-room/detail/03-03-2020-shortage-of-personal-protectiveequipment-endangering-health-workers-worldwide



# The CelluAir Solution

#### SUPPLY CHAIN SOLUTIONS

The AFT uses Nanocellulose materials and is decoupled from the traditional supply chain, thereby eliminating the bottlenecks in the supply of chemicals and materials used in the production of face masks.

#### ADVANCE PERFORMANCE

Through further research and development, QUT aims to develop the AFT to outperform traditional filtration technologies that are currently used in medical face masks.

#### SOVEREIGN SUPPLY

With development and initial commercialisation of the AFT to be undertaken domestically, the opportunity exists for Australia to secure a sovereign supply.

#### MULTIPLE APPLICATIONS

The AFT has multiple applications including medical, construction, and air treatment industries, thereby providing a significant opportunities for both CelluAir and Nanollose.





### Multiple Applications & Markets



### USD \$11.0B

2020 value of the global face mask market with Strong growth forecast

https://www.grandviewresearch.com/industryanalysis/industrial-air-filtration-market

### **USD \$18.0B**

2027 forecast value of the global industrial air filtration market

**7.3% CAGR** Forecasted from 2020 - 2027



# Industry Supply Chain

#### TRADITIONAL INDUSTRY

Oil Refinery



Poly-propylene threads



Filter Manufacturer



Mask Manufacturer ———

→ Mask Distributor

Honeywell

#### Raw Material

#### CELLUAIR NEW INDUSTRY

- Sugar Cane Bagasse
- Wood Pulp
- Commercial Nanocellulose

#### **QUT** the university for the real world

#### QUT Process

- Unique process
- Ability to use existing contract manufacturers

#### CelluAir is pursuing a collaborative entry into the face mask market





New entrants include Detmold and Evolve



# **Development Strategy**

#### SHORT TERM PROJECT

(Currently Underway)

- Pilot small scale to be accelerated from lab to test full scale batch production.
- Identification of any challenges may occur.
- Developing a clear path forward towards commercialisation.
- The accelerated development will be based on a quazi-sovereign value proposition, only importing items readily available.
- Investigating the possibility of using Nanollose's microbial cellulose as a replacement for plant-based nanocellulose.

#### **LONG TERM PROJECT** (Commencing January 2021)

- Carry out research to seek solutions to overcome issues identified in the fast-tracked project.
- Ensure more detailed testing and performance data is obtained, which may potentially include medical testing.
- Endeavour to match the second-half of the budget with QLD state Government COVID-19 targeted research funding to focus on developing a full sovereign value proposition.





## The CelluAir Team





### **Dr Thomas Rainey**

#### RESEARCH LEAD

- Process engineer with 15 years' experience.
- Bioeconomy researcher, working with the QUT biofuel engine research facility.
- Currently Coordinator for Chemical Process Engineering at QUT.
- Previously worked in the pulp and paper industry making Kleenex tissue at Kimberly Clark.
- Leads the research and process development of the nanoparticlate filter.

### Andy Robert

#### COMMERCIALIZATION LEAD

- Former CEO of the Water Industry Alliance at a time of significant industry upheaval as a result of the millennium drought, having a a significant impact on government policy during his tenure there.
- He has worked as a CEO, Project Lead and managed software and engineering contracts for a wide range of clients during his time as a consultant and first worked as a mentor in Innovyz Commercialisation Programs.
- In November 2016, Andy co-founded Rogue Lumens, a company with a focus on disruptive technologies relating to vision and light.
- Bachelor of Engineering in Water (Civil) Engineering and a Bachelor of Science (Computer Science, Artificial Intelligence & Applied Mathematics) and has completed the Australian Institute of Company Directors course.



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