**Annex A: About the Recipients of the IPOS Innovation for Humanity Award**

1. **AMT Pte Ltd**

*Nominated for their Polymerase Chain Reaction (PCR) test kit, developed in collaboration with DSO National Laboratories and Agency for Science, Technology and Research (A\*STAR).*

AMT collaborated with Singapore-based research laboratories, A\*STAR, to ramp up the manufacturing of RESOLUTE, a fast and reliable Direct RT-PCR COVID-19 diagnostic kit that has a turnaround time of only ~75 minutes.

RESOLUTE allows nasopharyngeal swab samples to be processed without the need for RNA extraction. The removal of this time-consuming step has enabled the worldwide shortage of RNA extraction reagents to be circumvented.

Since RESOLUTE operates on standard PCR equipment and laboratory consumables, its workflow can be easily implemented in existing and newly established laboratories. This flexibility allows for a wider accessibility for laboratories to incorporate cost-saving options and ramp up COVID-19 testing.

A\*STAR’s cutting-edge RESOLUTE test kit and AMT’s efficient manufacturing pipeline will meet the urgent medical need for speed and reliability in COVID-19 diagnosis. As of July, 250,000 RESOLUTE kits have been deployed.

1. **Esco Aster Pte Ltd**

*Nominated for their mass screening swab booth and mobile diagnostics laboratory.*

To combat the uncertainty of COVID-19, Esco Aster quickly synthesized its solutions through a Trace, Test and Treat platform. This encompasses solutions from biocontainment to diagnostics and finally, treatment through vaccine development, with various development timelines.

The commercial products developed include the Mass Screening Swab Booth (MSSB™) and a mobile diagnostics laboratory, Aster Xpress™.

The MSSB™ unit, or COSMOS (COVID-19 Swabbing Mobile booths), is designed for mass diagnostic testing of asymptomatic, symptomatic, and COVID-19 positive patients, while simultaneously providing protection for the healthcare professional, the patient, and the environment. With the MSSB™, mass testing can be conducted rapidly and with enhanced protection, reducing the risk of infection due to testing/swabbing. Its proprietary designs are developed in-house and ensure protection through programmed pressurisation in the MSSB™. The MSSB™ can test 12-15 patients per hour (not including consultation time). The misting function can also be pre-installed for effective decontamination between each swab.

The mobile diagnostics laboratory, Aster Xpress™, is a turnkey solution, vertically-integrated with Esco’s internationally-certified biological safety cabinets, that offers biosafety and protection for the laboratory technician and environment, preventing laboratory acquired infections as well as reduction of potential false positives. The filtered airflow in the Aster Xpress™ enables control of the virus and meets international safety standards similar to hospitals. The Aster Xpress™ and its equipment can be customized to scale up testing capabilities of labs and hospitals and can be rapidly deployed, including in areas with little to no access to medical facilities.

The modular design is key. The MSSB™ and Aster Xpress™ can be deployed singularly or integrated together, so COVID-19 testing capacity can increase in a more efficient manner. With the MSSB™, tests that are usually performed in hospital labs can be carried out in the Aster Xpress™ where it is deployed.

Currently, both the MSSB™ and Aster Xpress™ are commercially available. 50 units of MSSB™ have been ordered locally and several of these units are already deployed in Singapore.

1. **JSB Tech Pte Ltd**

*Nominated for their COVID-related design for face masks.*

JSB developed the eGeePro Reusable Face Mask which incorporates an N95-grade refillable filter that allows for reusability, compared to one-time-use disposable surgical or N95 masks. As compared to reusable cloth/cotton/fabric masks where filtering quality degrades with each washing and drying, the eGeePro mask's filter can be swapped out for a brand new one, ensuring no degradation.

The design of the eGeePro mask encompasses a partition between the nose and mouth chambers, segregating droplets generated from the mouth and nose chambers, thus minimising odours commonly found in cloth/N95 masks especially with prolonged usage.

The small-size plastic protective cover of the mask is specifically designed to minimise the volume of exhaled air recirculating inside the mask chamber and being re-inhaled, enabling more fresh filtered air to be inhaled. The sharp down-slope contour design on the upper-nose area of the plastic protective mask ensures that the wearer's vision is not obstructed, thereby preventing blind spots when engaging in any activities.

The eGeePro mask is commercially available.

1. **KroniKare Pte Ltd**

*Nominated for their automatic fever detection solution. (Co-created with IHiS.)*

Identifying the urgency for a more convenient method for mass screening of temperature, KroniKare's in-house development team came together with a team from IHiS to create the iThermo Thermal Scanner.

iThermo is a lightweight solution that uses a smartphone fitted with thermal and 3D laser cameras. The AI application processes and analyses the images from the smartphone camera (which captures facial features) and maps them to images from the thermal camera (which measures temperature) as well as the laser camera (which measures distance).

The system can measure forehead temperature even when a person is wearing spectacles, surgical masks or other headgear. Unlike other thermal scanners that will pick up a hot drink on their screens, the iThermo only detects forehead temperature. KroniKare even did away with the need for external power to run the iThermo to make it portable and useable almost anywhere, instantly. The iThermo has undergone independent 3rd party tests by TÜV SÜD, has ISO 13485 certification and is registered with the Health Sciences Authority as a Class B medical device.

As of July 2020, the iThermo is used in over 170 sites in Singapore including hospitals, medical centres, sports complexes, schools, offices and bus depots.

1. **Lucence Diagnostics Pte Ltd**

*Nominated for their novel saliva collection kit. (Invented at A\*STAR and commercialised by Lucence through IP transfer.)*

The SAFER™ Sample saliva specimen collection kit allows for the collection of saliva samples and the inactivation of the virus for further processing. This device offers an accurate, safe and convenient way to collect saliva samples for further testing.

The kit features a proprietary formula of a virus transport medium that achieves accurate diagnosis by preserving viral ribonucleic acids at room temperature for up to a week, without chilling. Otherwise, degradation can happen at room temperature, leading to false negatives. This removes the constraint of strict shipping conditions at low temperatures which may not be readily available, and makes testing possible and more convenient in previously inaccessible areas, expanding the reach of healthcare.

The kit is also able to completely inactivate the SARS-CoV-2 virus within 45 seconds of exposure, which greatly improves the safety of the community and healthcare workers while they collect and process patient samples. SAFER™ is currently undergoing evaluation in Singapore, and is commercially available in Hong Kong.

1. **MiRXES Pte Ltd**

*Nominated for their mass production of the Fortitude Kit COVID-19 tests, applying their manufacturing know-how. (Fortitude Kit is based on patented technology licensed from A\*STAR.)*

As a manufacturer of PCR-based diagnostic tests for early detection of cancer and long-standing development partner of DxD Hub, A\*STAR and TTSH, MiRXES was called upon to mass produce the Fortitude Kit so that it could be rapidly deployed to hospitals in Singapore and the region to combat the COVID-19 outbreak.

MiRXES completed the technology transfer within a week and started producing 100,000 tests a week, sending these to local hospitals and clinical labs, both public and private, as well as to other countries in the region.

As of June 2020, more than 2 million tests have been produced, which have been deployed in 13 hospitals and labs in Singapore and more than 20 countries worldwide.

1. **Spic & Span Pte Ltd**

*Nominated for their Speco disinfecting solution.*

Speco® is a durable disinfectant coating that protects most work environments from microbes including Salmonella, MRSA, and Black Mould. Its effectiveness is guaranteed for six months. The formulation has been enhanced with active ingredients required by NEA to handle places contaminated by COVID patients. The enhanced formulation has been lab-tested and certified effective against coronaviruses.

The company also added a complete QA/QC process to provide comprehensive coverage to clients reopening their premises during Phase 2.

Speco® has been deployed to more than 1 million sq ft of property over the past six months, and is currently being used at many of Singapore’s most important sites, including Changi Airport, Seletar Airport, Singapore’s military bases, NTUC, Singtel, Singapore Airlines, dorms, medical hostels, banks and a wide spectrum of commercial, educational, religious, residential and retail locations.