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EPD Tracer

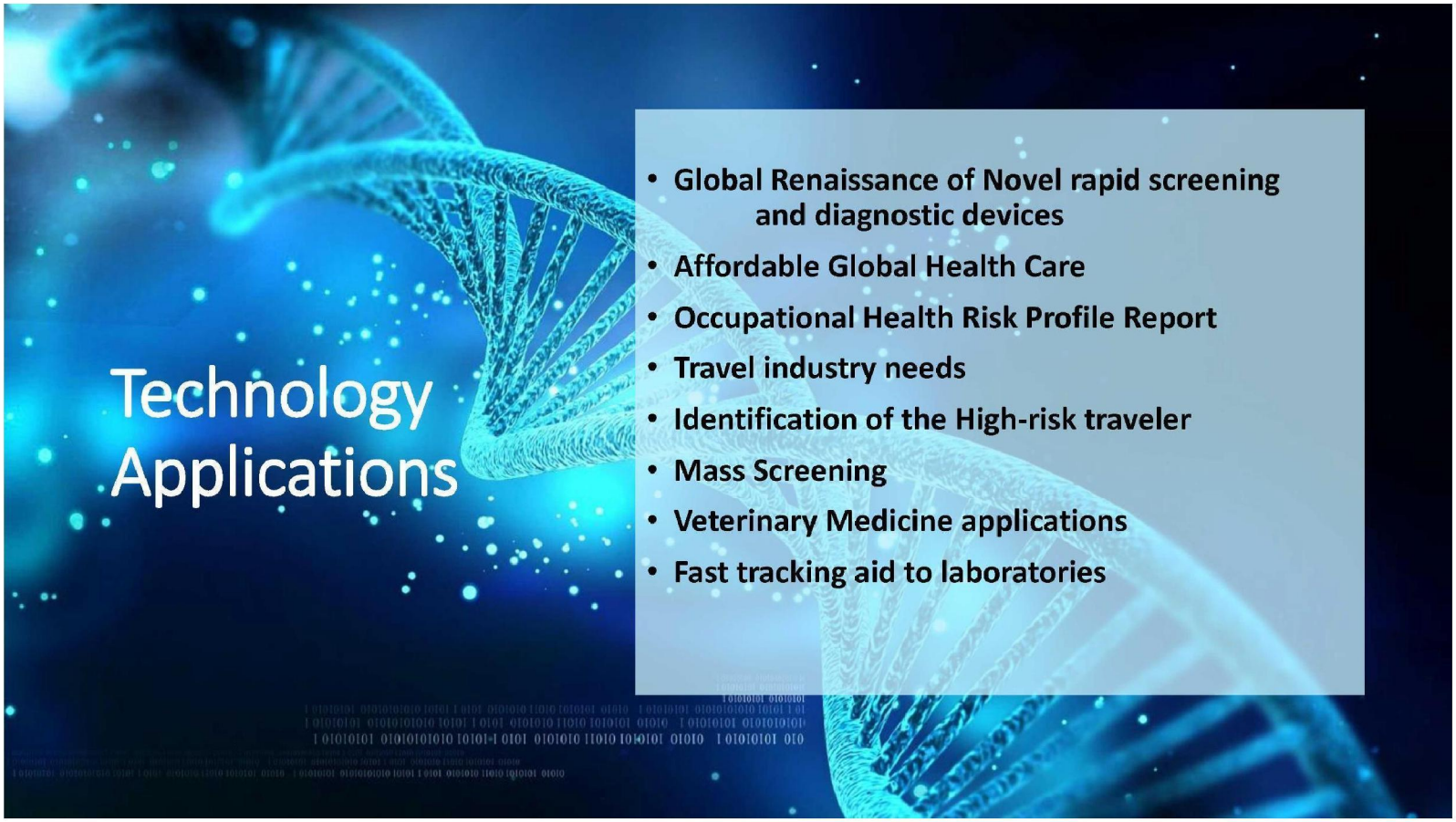
NON-INVASIVE scanning device which takes 7 minutes to scan and provide real-time analysis

Harmless (microamp sensing current from 6-volt source)

Global roll out possible in 6 to 12 months

Electronic Pathogen Detection (EPD)


Introduction to
EPD Technologies
Bio Tracer
The thinking behind the technology
NON-INVASIVE data recording device which takes 7 minutes to scan and provide real-time results
DNA RNA structure of pathogens used as basis for analysis
AI statistical database analysis
Low cost, fast scanning device
Mass Screening possibilities
Pandemic management


Technology Applications
• Global Renaissance of Novel rapid screening and diagnostic devices
• Affordable Global Health Care
• Occupational Health Risk Profile Report
• Travel industry needs
• Identification of the High-risk traveler
• Mass Screening
• Veterinary Medicine applications
• Fast tracking aid to laboratories

Methodology
Thank you

Facts to consider

- We understand that DNA/Proteins are the building blocks of the human organism
- We can prove scientifically that every cell's DNA/Protein structure creates a reaction to frequencies related to the cell's biological structure
- Science, physics and mathematics are the basis of this new technology

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Research Foundation

The immune system's response to pathogens are based on their electrical outputs and measurable through the skin

- The skin is the largest organ in the human body, and richly innervated.
- **Neurological tissue and skin originate from the same embryonic layer** - the ectoderm. Skin Conductance or EDA (Electro Dermal Activity) can utilise the sympathetic nervous system peripherally and centrally, as confirmed by functional MRI.[1] "Simunye the old Zulu proverb "We are one" ☺ Brain and Skin – we are one"
- This is done through sympathetic post-ganglionic fibres, consisting of non-myelinated class C fibres, innervating sweat glands or eccrine glands.
- Bioelectrical impedance analysis (BIA) is used to assess body composition, intra- and extracellular water, and components, capitalising on the conductive properties of the body. BIA is considered safe and accurate. [2]
- By understanding these concepts and how the body will react to frequency stimuli, the EPD Bio-Tracer was developed.

[1]McBride and Schmorrow, 1967-2005; Sadler, 2014; Critchley, 2002; Dawson, Schell and Filion, 2007
[2]Mialich et al., 2014; Kotler et al., 1996; Nyboer and Kornmesser, 1970

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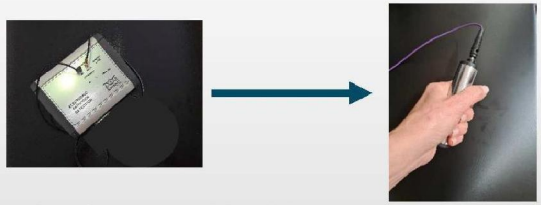
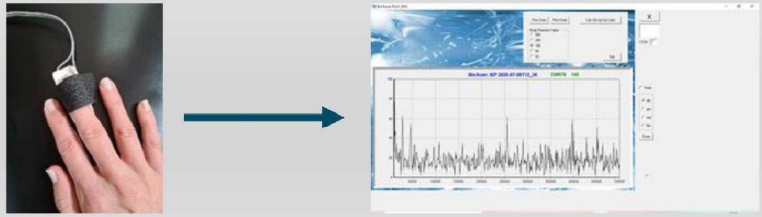
EPD Scan Process - Basics

- We apply a fixed series of electrical frequencies (very low voltage <6V and current 500µA) to the human body via skin.



- The body reacts to these frequencies (measurable skin voltage changes), (BRV) body reaction related frequencies are displayed.



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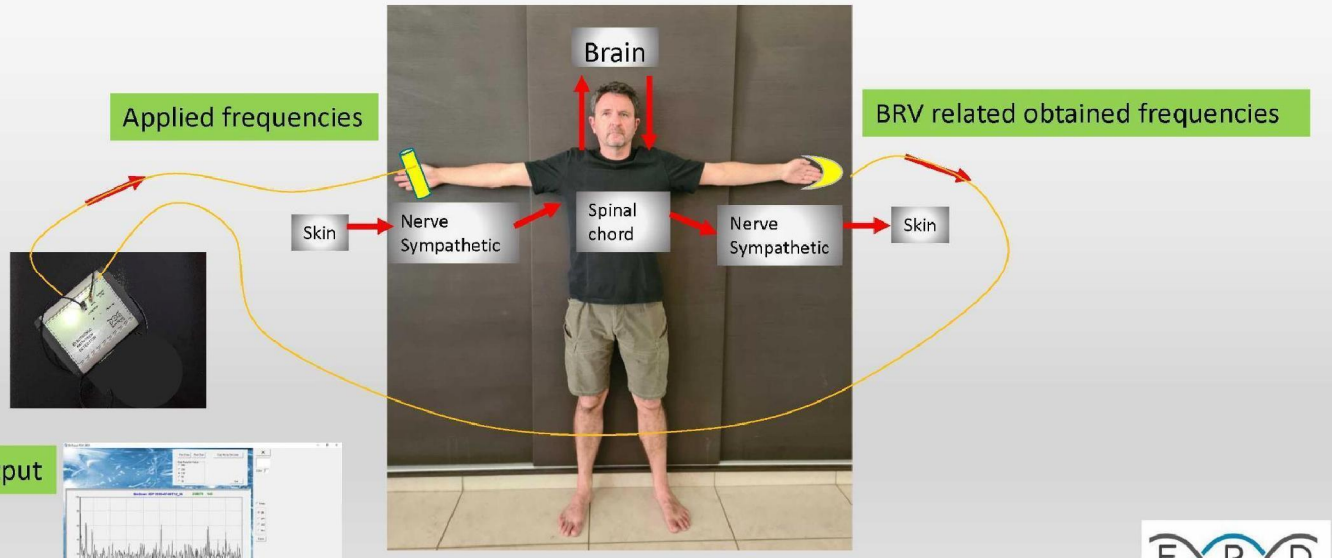
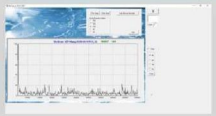
EPD Scan Process



Scanner Technology

1 Perform EPD Scan (Proprietary Technology)

2 Body reaction converted to Graph



Body reaction Graph

3 Comparison of Graphs

EPD Library of Pathogen molecular data Graphs

A Public Databases Proteins (Uniprot)

B Conversion of Pathogen Protein molecular data to Graph (Proprietary Technology)

4 Output: Pathogen Present or Absent

Scan Report

Covid 19

Absent

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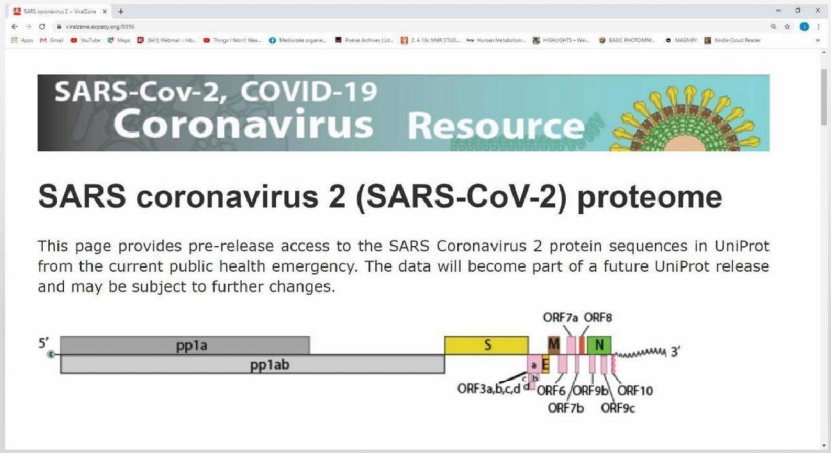
EPD Test results COVID 19 Score

- EPD test result outputs a COVID Score

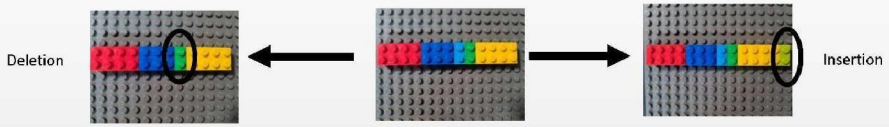
- This score comprises of 10 SARS CoV -2 proteins:



Replicase Polyprotein 1a = 2 targets
Replicase Polyprotein 1ab = 1 target
S protein = 2 targets
Protein 3a
Envelope small membrane protein
Protein 7a
Protein 7b
Uncharacterized protein 14

Why EPD Technology should be considered?

- Molecular Biology:
  - Pathogen genetic *mutations* (viral, bacterial, etc) include insertion, deletion or base pair re-arrangements which *affect the accuracy of all viral nucleic based tests*, like PCR.



    - **Mutations do not affect EPD technology**
  - Current PCR tests use 2 or 3 viral nucleic acids as targets in their probes.
    - **Multiplex PCR tests have sample size related sensitivity advantages, but are expensive- EPD technology permanently functions as equivalent to a multiplex PCR test.**
  - EPD technology has the **possibility** to allow the simultaneous evaluation of other proteins ie. **cytokines and interleukins** IL6, IL8 and Interferon, etc. using the same scan.
  - In the advent of a next world pandemic, once the causative pathogen and it's proteins are sequenced – we will be able to start testing immediately.

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Typical process of SARS-CoV2 in Humans

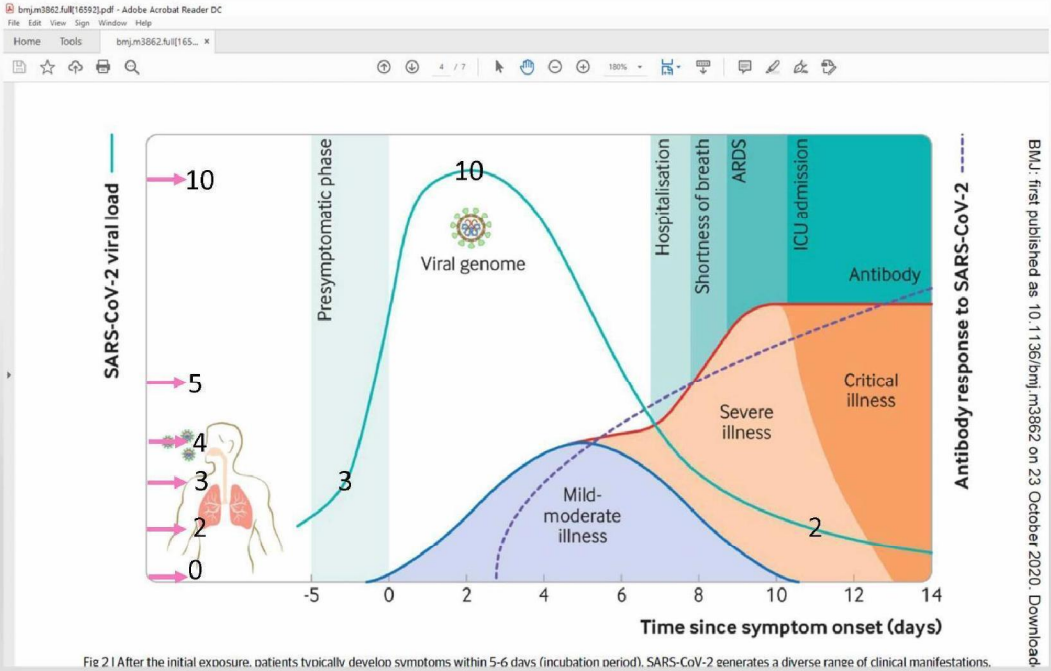
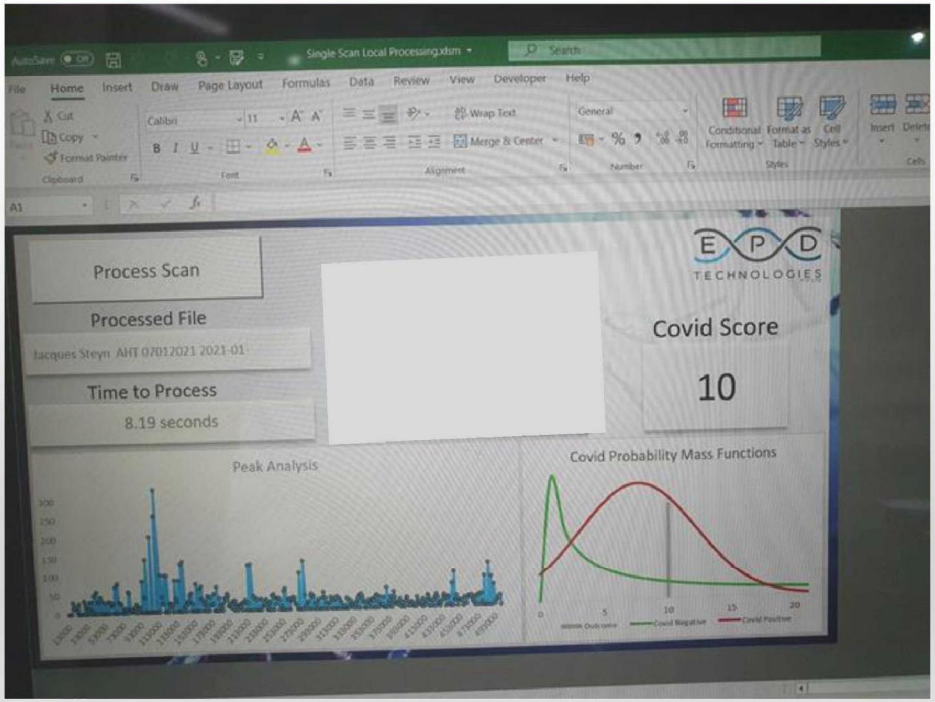


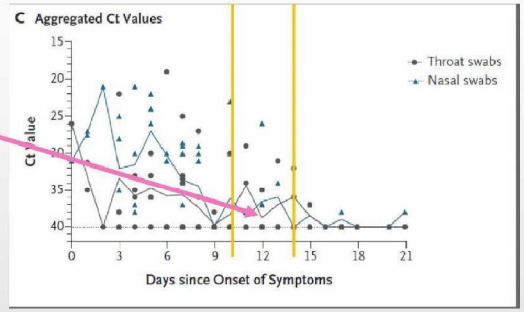
Fig 2 | After the initial exposure, patients typically develop symptoms within 5-6 days (incubation period). SARS-CoV-2 generates a diverse range of clinical manifestations.

Score output format



Data numbers and opportunities

- SARS CoV -2 Human data "just out of quarantine"
  - Small PCR positive group n=17
  - PCR positive post quarantine individual's day 10 to 14 where the viral load would be expected to be low
  - (Large Pre Covid-19 control n= 645 group.)



N ENGL J MED 382;12 NEJM.ORG MARCH 19, 2020

Score	Control n= 645		PCR+ ve n = 17	
0 to 3	75.8	%	35.3	%
4	10.1	%	11.7	%
5 to 10	14.6	%	52.9	%

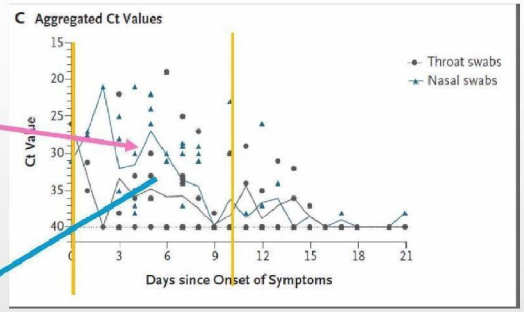
Persistent positive PCR tests
Can remain up to 120 days after infection

Examining more PCR positive individuals earlier In the disease would increase the amount of individuals with high scores

EPD TECHNOLOGIES

Data numbers and opportunities

- SARS CoV -2 Human data “acute phase disease”
  - Small PCR positive group n=19
  - PCR positive individuals' day 0 to 10
  - (Large Pre Covid-19 control n= 645 group.)



N ENGL J MED 382;12 NEJM.ORG MARCH 19, 2020

Score	Control n= 645		PCR+ ve n = 19	
0 to 3	75.8	%	0.0	%
4	10.1	%	15.8	%
5 to 10	14.6	%	84.2	%

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Why EPD is significant?

- SCAN BRV Comparison and Viral Activity Tracking:
  - EPD technology offers effortless sequential screening in individuals – ie. comparing an individual's BRVs and viral scores from week to week – thereby tracking viral activity.
  - A scan is a digital impression of all pathogens detected at that point in time in a living body, and is saved as a small TXT file.
  - The scan can thus be used in future as a control group to see if newly discovered pathogens or pathogen chains are present in the scan. This is analogous to blood banks saving serum samples of individuals for future testing. The SARS CoV-2 PCR test validations were for instance done on saved serum samples that predates 2020.
- Cost:
  - A single scan estimated at less than 3 U$D per scan.
  - One scanning unit @ a fraction of PCR lab equipment.
  - Setup of EPD trial 150 000 to 250 000 Euro

EPD TECHNOLOGIES

Cloud AI Analytics

Data capture, -storage, and -analytics is done on a central cloud-based system:

- Hosted in Microsoft Azure environment
- Receives data from all devices via Wi-Fi and/or mobile connection
- Stores data in Azure 'Big Data' environment
- Custom pathogen database
- Realtime data analytics – scanned data
- Data analysis combining scanned and external information

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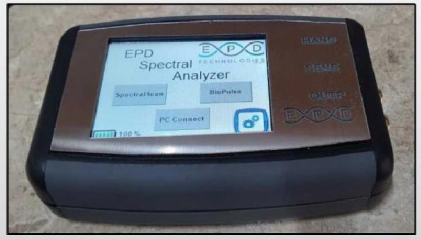
Flexibility and Scalability

- Demographics
  - Equipment is battery driven (8h) – well suited for both high and low socio- economic countries (electricity scarce resource countries).
- Eco Friendly
  - EPD equipment generates minimal waste – no plastic containers, gloves, reagents, swabs etc.
- Ergonomics and Portability
  - EPD Scan units are pocket sized (latest version).
  - Length 100mm Width 62mm Depth 27mm Weight 120g



- Scalability
  - **EPD Technology is a mass screening solution for Asymptotic infected individuals.**
  - **It is ready for mass production after 14-year development cycle**

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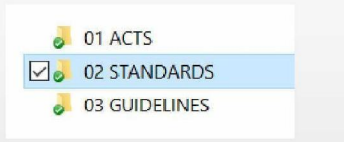
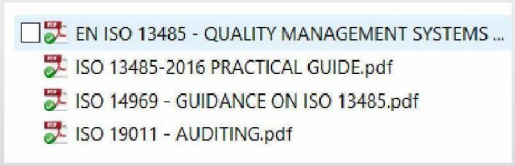
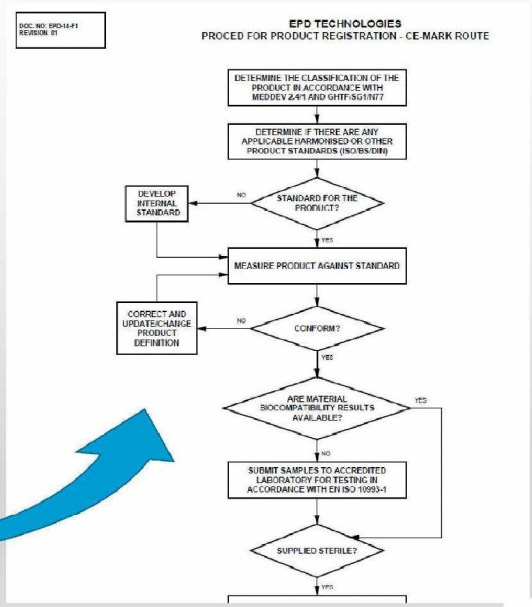
CE Accreditation & FDA & SAHPRA Certification

EPD ISO 13485 AND CE-MARK – in Process of Registration







Application : Airports – Incoming Passengers

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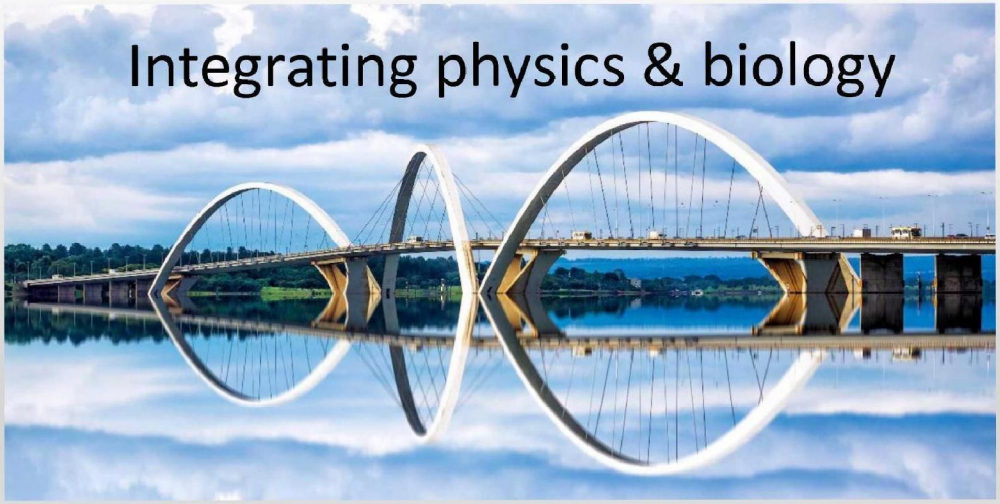

Electronic Pathogen Detection (EPD)

Thank You

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