EDCTP

The power of sharing science

Acronym – **COVAB**

Grant Reference RIA2020EF-3008

Grant Title : Investigating COVID-19 infectiousness and antibody evolution in COVID-19 PATIENTS in SSA and Europe

EDCTP COVID-19 Webinar

Zoom, 18-19 Mar 2021

Dr Julie Fox| Kings College London

Coordinator

Rationale and objectives

OVERALL AIM: Gain understanding about natural antibody and mucosal responses to SARS-CoV-2 infection

Builds on capacity development in EDCTP funded HIV prevention programmes (CHAPS & PrEPVaCC) and is taking place in South Africa, Uganda, Sweden and UK

Objectives:

1. **Understand evolution of SARS-CoV-2 antibodies following infection: UK & Uganda (WP1: Mike Malim)**

a. Characterise quality, phenotype, evolution and durability of SARS-CoV-2 antibodies
b. Determine effect of previous seasonal coronavirus on SARS-CoV-2 disease severity
c. Clone SARS-CoV-2 spike specific human monoclonal antibodies with potent virus neutralising capabilities.

2**. Develop an ex vivo challenge model using oral and nasal tissue to: (WP2: Neil Martinson).**

a. Determine risk factors for SARS-CoV-2 acquisition
b. Investigate effect of SARS-CoV-2 on upper respiratory tract immunology.
c. Correlate ACE-2 and TMPRSS2 expression with susceptibility to SARS-CoV-2 infection

3. Develop understanding from communities to develop information tools and engagement for future COVID trials in a rural community, Uganda (WP3: Janet Seeley).

Antibody evolution update (WP1)

Design

Analyse longitudinal blood samples collected from cases in UK and Uganda.

Use shared lab methods to examine antibody responses, and to clone and characterise human SARS-CoV-2 monoclonal Ab

Update:

- All samples collected– analysed UK samples
- Assay validation and tech transfer between UK and Uganda underway
- The General Population cohort now collecting weekly samples 20 000 Uganda – to carry out SARS-CoV-2 case control study evaluating prevalence of pre-existing corona infections

- Through EDCTP networking we collaborated with Andreas Moor and obtained BOTNA funding to compare COVID-19 antibody repertoires in infection and vaccination. And investigating special populations, incl HIV positive people with low CD4 counts

Ex vivo challenge model update (WP2)

Design:

Prospective ex vivo SARS-CoV-2 challenge study using oral and nasal tissue biopsies taken from groups of healthy volunteers. Samples will be infected with SARS-CoV-2 in the lab and establishment of infection measured.

- Part 1: validation of model
- Part 2 : recruit groups of eligible participants: HIV serostatus, age, smoking, previous COVID-19 infection

Primary endpoint: infection of tissue defined by PCR day 15 culture

Secondary endpoints: inflammatory markers tissue

- **Update:**

- Lab manual developed and ex vivo challenge training occurred
- South African and UK SARS-CoV-2 viruses cultured
- Ethics delays ++++. Now starting validation phase with tissue resected during planned procedures

Social science update (WP3)

Design:

9 Focus groups, 45 IDIs and a survey n=1500 carried out amongst the General Population Cohort of 23000 people living in rural Uganda.

Update:

- 7 out of 9 Focus groups done
- Survey started March 2021
- 2 Workshops planned for april
  - HCW having vaccine
  - General population no vaccine available

Publications and other communications

- **Networking**
  - WPs working together
  - Linked with General population cohort, Uganda (Rob Newton)
  - Submitted COVID UKRI SARS-CoV-2 networking grant

- **Presentation:**
  - Doores K. Longitudinal Antibody Responses to SARS-CoV-2 and Emerging Variants – King's College London, London, United Kingdom. Oral presentation CROI 2021

- **Publication:**
  - 1 manuscript submitted

Focus on special populations

- **HIV positive people (WP1 and 2)**
  - Ex vivo challenge model
  - Vaccine responses in HIV +ve people with low CD4 , vertical transmission
- **New emerging products (WP2)**:
  - Tested using the ex vivo challenge model
- **Rural communities (WP3)**
  - Public engagement for vaccine roll out