My COVID Story

Addis Ababa, Ethiopia
2020: Started with Puppies—What could go wrong?
COVID19 in Ethiopia

- Population: ~109 Million (~3xCalifornia)
- Size: About 2x Texas
- Decentralized public health system
- National molecular virology lab
  - Flu, VHF, measles, AFI... ALL the viruses!
  - Three laboratory technicians
  - Three ABI7500 Fast
  - Excel spreadsheets
February 3, 2020

The virus’s most vulnerable target is Africa, many experts said. More than 1 million expatriate Chinese work there, mostly on mining, drilling or engineering projects. Also, many Africans work and study in China and other countries where the virus has been found.

If anyone on the continent has the virus now, “I’m not sure the diagnostic systems are in place to detect it,” said Dr. Daniel Bausch, head of scientific programs for the American Society of Tropical Medicine and Hygiene, who is consulting with the W.H.O. on the outbreak.
February 9, 2020

**LightMix® Modular SARS and Wuhan CoV E-gene**

Cat.-No. 53-0776-96
Roche SAP n° 09 155 386 001
Kit with reagents for 96 PCR reactions 20 µl for detection of WH-Human_1 genomic RNA [lyophilized]

1. **Content, Storage and Expiry**

   - 1 Vial yellow cap 96 reactions CoV (lyophilized)
   - 1 Vial black cap RNA Positive Control Cp ~ 30

   • Kits are stable for one year after production (store 4°C to 25°C in the dark). See lot-specific expiry date.
   • Reconstituted reagents are stable for two weeks if stored protected from light and cooled (2°C to 8°C).
   • Dissolved reagent can be stored long-term if frozen (-15°C to -25°C). Avoid multiple freeze-thaw cycles.
   • Reconstituted positive controls must be stored frozen. Minimize multiple freeze-thaw cycles.

2. **Storage at Arrival:**

   Store cooled or at ambient temperature. **Do not freeze** the lyophilized reagents.

3. **Additional Reagents required**

   LightCycler® Multiplex RNA Virus Master
   Cat.-No. 06 754 155 001

4. **Introduction**

   Coronavirus (CoV) are positive-stranded RNA viruses from the Coronaviridae family. The four common human pathogen strains 229E and NL63 from the Alpha group, and OC43 and HKU1 from the Beta group are known. Other coronaviruses were identified within these groups and new ones are being discovered constantly.
February 9, 2020

But....

No Taq

“It's like ten thousand spoons when all you need is a knife.”

-Alanis Morissette
March 13, 2020

Map of African countries with Confirmed and persons under investigation for COVID-19
14 March 2020 - 11:00 am EAT
MicroAmp® Fast Optical 96-Well Reaction Plate with Barcode (0.1mL)
For use with Applied Biosystems Real-Time PCR Systems and End-Point PCR Systems.
PCR Compatible DNA/ RNA/ RNase Free
Qty: 20 Plates
For Research Use Only, Not for human or animal therapeutic or diagnostic use.
MicroAmp is a registered trademark of Life Technologies Corporation or its subsidiaries in the USA and certain other countries. Made in China
10 PCR Plates in the whole country
SOS to OSU
Testing Evolution and Timeline

- February 7-April 7:
  - 1 lab, 3 laboratory techs working 24 hours a day
  - 1 PCR platform (ABI 7500 FAST)
  - 5 PCR kits (TibMolbiol, Da’an, BGI, Pontic, GeneoDx)
  - Some kits had no instructions in English
Testing Evolution and Timeline

• February 7-April 7:
  • 1 lab
  • 1 PCR platform (ABI 7500 FAST)
  • 5 PCR kits (TibMolbiol, Da’an, BGI, Pontic, GeneoDx)

• April 7 and beyond: rapid expansion
  • Up to 53 labs
  • 13+ PCR platforms
  • 9+ PCR kits
A Few Challenges...

• Stock and supply of consumables and reagents
• Training
  • Many labs had no prior capacity for PCR
  • Took place at the national molecular virology lab with the ABI 7500 FAST
  • Testing and extraction kits de jour—sometimes TibMolbiol, sometimes Da’an, sometimes chemical extraction and sometimes heat-based extraction methods
  • Limited to two days in Addis, no on-site training
• Monitoring quality
  • No site visits
  • No EQA program
  • Non-regulated laboratories (CLIA, CAP, ISO)
  • Different machines, different kits, different levels of expertise
    • A CT of 30 on one machine/kit is different on another