Overview of COVID-19 Projects

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BSE

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# DOE National Virtual Biotechnology Laboratory Projects

- Testing Working Group (Funded)
  - Digital Microfluidics for COVID-19 RT-qPCR Assay Miniaturization
    - LBNL: Nathan Hillson, Jennifer Chiniquy
    - SNL: Jess Sustarich, Kosuke Iwai, Robert Meagher, Anup Singh
- Advanced Manufacturing Working Group (Funded)
  - Probiotic vaccine (Deepika Awasthi)
- Decontamination and Sterilization Working Group (Submitted)
  - Ionic liquids (Ning Sun)
  - Ozononlysis (Antoine Snijders)
- Biodesign of Therapeutics Working Group (Submitted)

Industry Projects

ABPDU

- CASPR Bio: Produce and purify Cas12 enzyme to accelerate testing and deployment of diagnostic kits

- Swiftscale

  o Using innovative cell-free platform to accelerate the timelines for antibody production

  o ABPDU will generate cell-pellets for Swiftscale to optimize biocatalysis process

City of Hope – NERSC Collaborations
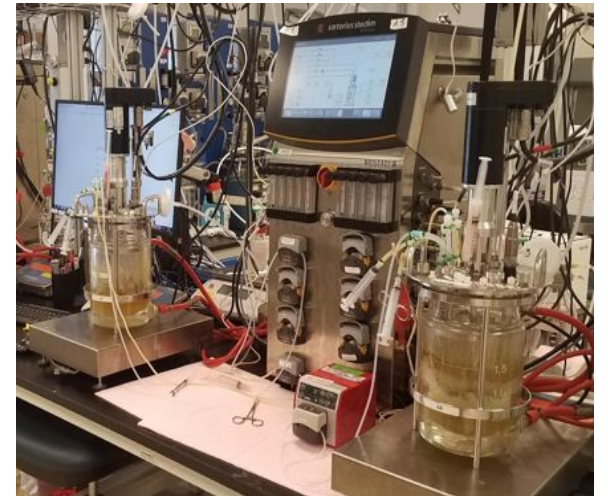
- City of Hope's Beckman Research Institute is using supercomputing resources at Lawrence Berkeley National Laboratory's (Berkeley Lab) National Energy Research Scientific Computing Center (NERSC) to:
  - Identify small molecules that can be used to assist in the diagnosis of COVID-19
  - Design peptide libraries to mimic virus-host interactions
  - Annotate the virulence of the Italian strain as compared to the Chinese strain of SARS-CoV-2

Collaborations with UC-Berkeley
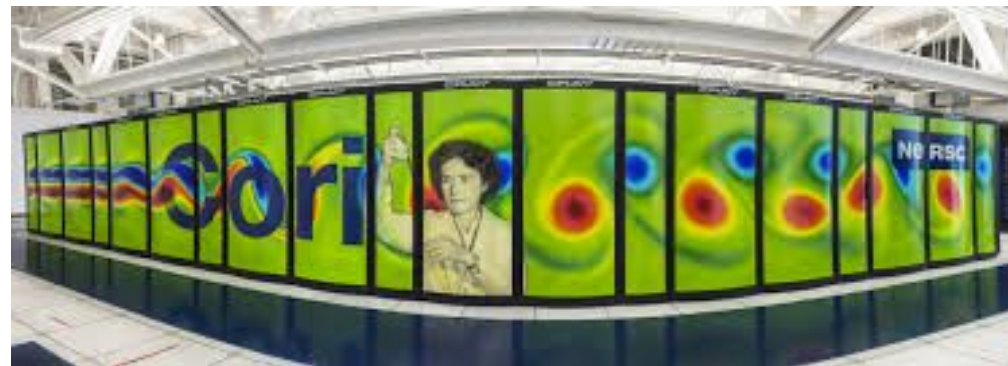
- Collaboration between Keasling and Cox groups focused on development of an antiviral drug capable of treating SARS-CoV-2/COVID-19

- Work is focused on nucleotide analogs that are commonly employed as antiviral small molecules that disrupt RNA polymerase-mediated viral genome replication

- Nucleotide analog therapeutics that suppress flavivirus infection also have activity against SARS-CoV-2 RNA-dependent RNA Polymerases

- Initial works indicate strong antiviral activity towards SARS-CoV-2