

Powerful Vaccine Discoveries Accelerated

The Race to Combat Infectious Disease

“Our ambition is to create a platform to react quickly to disease, which involves the creation of terabytes of imaging data. Using Oracle Cloud, we can distribute the data across multiple processors and get results in a fraction of the time of a traditional on-premise system.”

—Imre Berger, Professor Biochemistry and Chemistry, University of Bristol

ORACLE
for Research

imophoron 

 University of
BRISTOL

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Developing a New Class of Synthetic Vaccine to Outpace Infectious Diseases

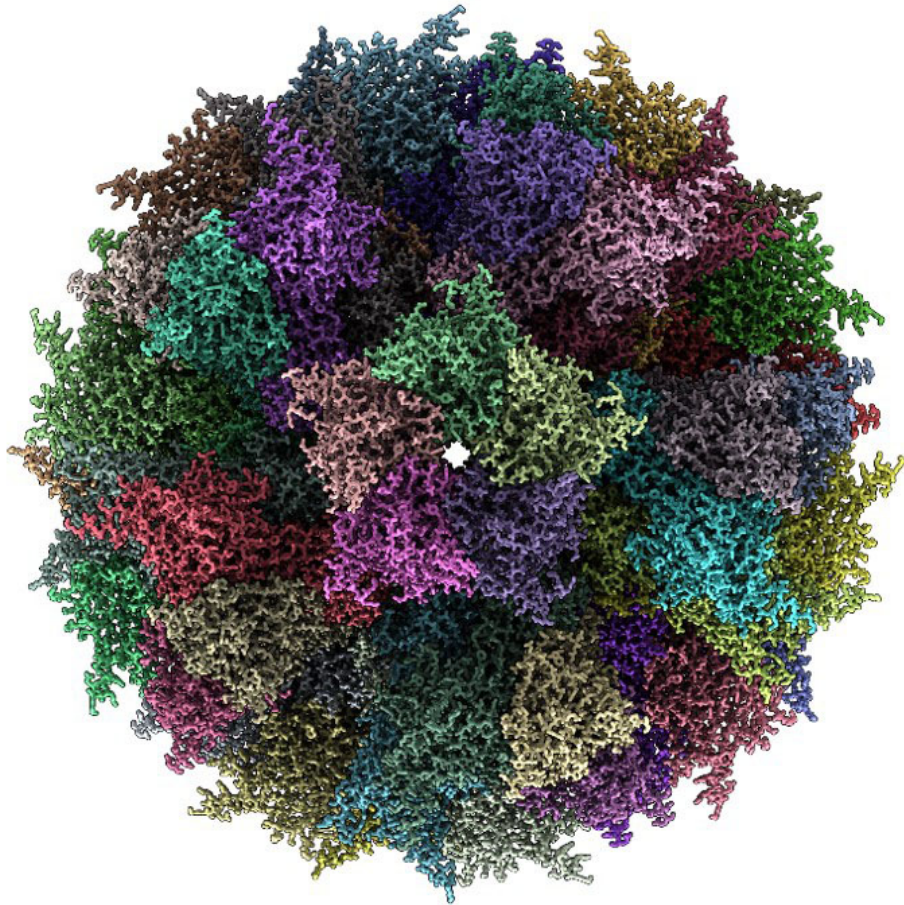


Imre Berger, University of Bristol, and Imophoron researchers watched as the infectious mosquito-borne disease Chikungunya, a resilient disease once confined to sub-Saharan Africa, began to march its way world-wide at an alarming pace.

Research has proven vaccination is a powerful front-line defense in the war against viral and pathogenic diseases. Traditional vaccine design and production technology resources impeded innovative vaccine discoveries. University of Bristol researchers needed a new approach.

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ADDomer: Synthetic multiepitope display scaffold for next generation vaccines. We developed ADDomer, a next generation synthetic vaccine that mimics features of Chikungunya virus, to efficiently prime the immune system to protect against this pathogen.

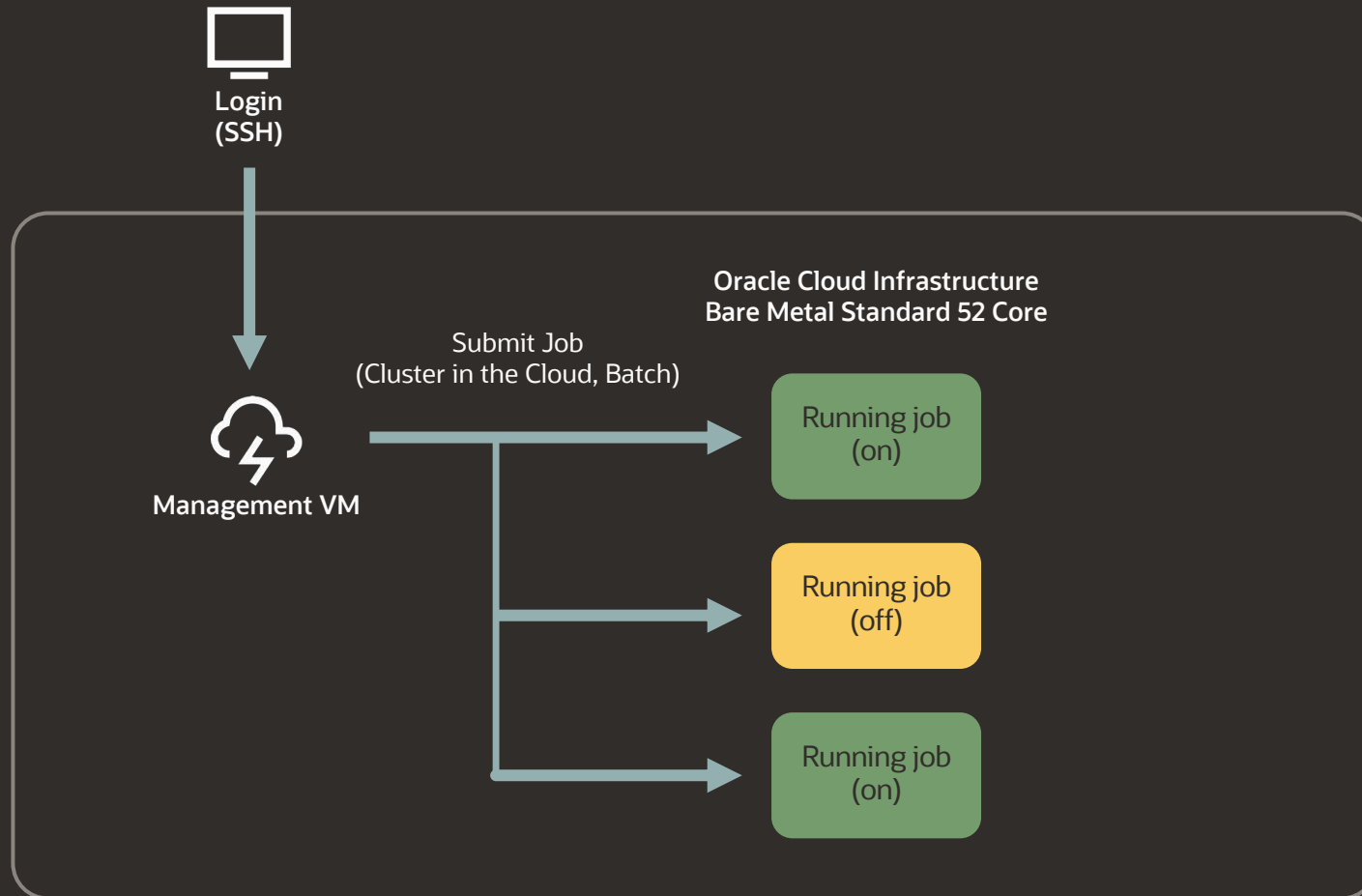
Image credit: University of Bristol

- University of Bristol and Imophoron researchers wanted to design a novel vaccine delivery system that is easy to produce in high volumes—an advantage for combating fast spreading infectious diseases.
- They envisioned a vaccine delivery system from a lab-produced, thermostable protein molecule that could be readily manufactured at low-cost and did not require refrigeration to retain viability—important for vaccine shipment to and storage in warmer climate locations.
- On-premise super computers needed the power of enterprise computing to process the very large data sets from University of Bristol's cryo-electron microscope which is integral to digital modeling for their pioneering vaccine research. University of Bristol researchers turned to Oracle's high-performance cloud infrastructure to develop a novel computational approach to create an accurate, high resolution digital model of their synthetic vaccine in a fraction of the time and at a much lower cost than previously thought possible.

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Oracle Cloud Architecture – Cluster in the Cloud



Performance Characteristics

- Best suited to heterogeneous high-throughput tasks
- Pipelines needing different node type(s) for different parts
- Can be much more specific than the average on-premise cluster
- Always have access to the latest hardware
- Nodes are only switched on and paid for while jobs are running
- Nodes are switched off automatically when idle
- Great for teaching clusters

Timing

- Full system test ~ 20 minutes on Oracle
 - Create Cluster from scratch
 - Submit job
 - Run job
 - Tear down whole cluster
- Job submit → job start: < 3-4 minutes