



# Empowering Researchers To Innovate Without Constraints

High performance computing from AWS, powered by Intel, delivers tangible results in genomics, clinical trials, and more

The need for high performance computing (HPC) is growing in life sciences disciplines such as genomics, clinical trial simulation, and computational chemistry.

To address this need, many organizations are moving their workloads to Amazon Web Services (AWS) and using Intel® Xeon® technology-powered Amazon EC2 instances for their research and engineering needs. AWS and Intel empower life sciences researchers to innovate without constraints by taking advantage of virtually unlimited infrastructure and agility not attainable on-premises. Here are four real-world examples.



## Genomics

Minutes matter for critically ill newborns



**33%**<sup>1</sup>  
NICU patients with genetic diseases



Fabric Genomics software, running on AWS and powered by Intel Xeon processors, delivers clinical insights for whole genome sequences within **1 hour**<sup>2</sup>

Genomic sequencing benefits:

**40%**<sup>3</sup> Newborns with unexplained illnesses who received life-changing treatments

[See the complete case study here](#)

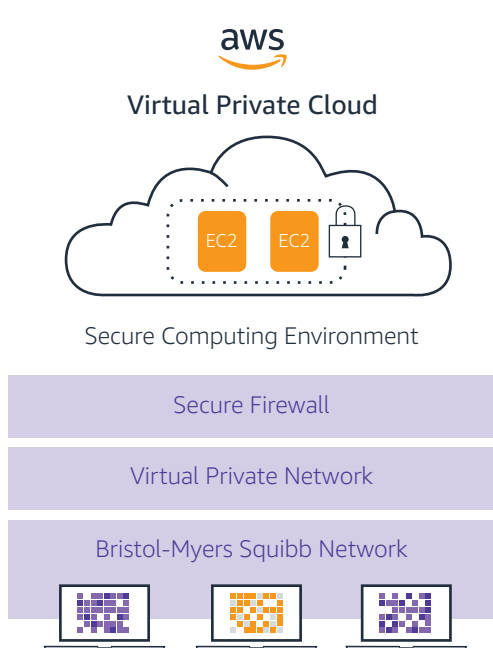
## Clinical Trial Simulation

Simulations dramatically reduce clinical trial costs



**US \$33.4M**<sup>4</sup> Median cost of conducting a study from protocol approval to final clinical trial report

BMS scientists use AWS Virtual Private Cloud to securely run compute-intensive simulations **98%**<sup>5</sup> faster



Clinical trial simulation benefits for typical pediatric study<sup>6</sup>

**Impact on trial subjects**  
33% fewer participants  
58% fewer blood draws  
46 hours reduced hospital stay

**Impact on business**

10 months Reduced length of study      \$450,000 Cost savings



[See the complete case study here](#)



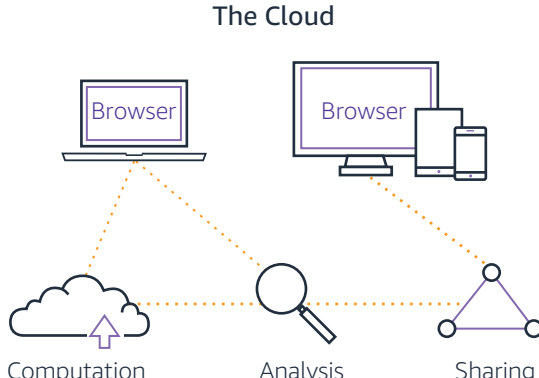
## Computational Chemistry

Cloud-based platform speeds time to market for new drugs

**10-15 years**<sup>7</sup>

Average length of drug discovery and development process

Researchers accelerate drug discovery using OpenEye Orion software running on AWS



Computational chemistry benefits:

**98%**<sup>8</sup> faster deployment of 100,000 cores for research computations

[See the complete case study here](#)

## Artificial Intelligence

Deep learning algorithms will read X-rays and guide interventions



**70%**<sup>9</sup>  
Americans who will receive at least one X-ray this year



Algorithms developed by GE Healthcare and CDHI running on AWS will learn to detect anomalies more accurately and efficiently

### Typical deep learning application

Automatically identify abnormal images to help clinicians quickly prioritize and treat patients with pneumothorax, a potentially life-threatening condition



[See the complete case study here](#)

1 JAMA Pediatr. 2015; 169(9):855-862, doi: 10.1001/jamapediatrics.2015.1305.  
 2 [https://www.fabricgenomics.com/app/uploads/2018/07/F\\_CS\\_Rady\\_v2.pdf](https://www.fabricgenomics.com/app/uploads/2018/07/F_CS_Rady_v2.pdf)  
 3 <http://time.com/4951200/genetic-testing-providing-hope-babies-ailments>  
 4 Linda Martin et al, "How much do clinical trials cost?" Nature Reviews Drug Discovery, June 2017.  
 5 <https://aws.amazon.com/solutions/case-studies/bristol-myers-squibb/>  
 6 Bristol-Myers Squibb.  
 7 <https://www.omicsonline.org/open-access/in-vivo-studies-for-drug-development-via-oral-delivery-challenges-animal-models-and-techniques-2153-2435-1000560.php?aid=94022>  
 8 <https://aws.amazon.com/solutions/case-studies/openeye-scientific/>  
 9 <https://partners.wsj.com/aws/partnering-for-ai-innovation/>

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