Lifebit
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The data platform that breaks down barriers and transcends borders

The biotech company's federated platform has enabled it to accumulate some high-profile pharma and drug discovery partnerships in its five-year history.

Finding routes to novel therapeutics requires large amounts of genomic data. But efforts to collect and use these data are often hampered by the need to guarantee a high level of data security, making it difficult to pool information from biobanks across the world. Lifebit, a London-based software firm, has a solution to that problem. Its patented technology enables researchers to run analyses on multiple, distributed datasets in-situ, thereby avoiding the risks involved in moving highly-sensitive data. The company's federated platform, Lifebit CloudOS, is fast gaining traction among research organizations and government biobanks around the world, advancing drug discovery and precision medicine in the process and breaking down barriers to sharing clinico-genomic data. In doing so, said CEO Maria Chatzou Dunford, Lifebit is also helping many large organizations to forge collaborations for the first time, finally unlocking the potential insights that can be gained from clinico-genomic data.

An abundance of data produced by genome sequencing means traditional sharing methods that use third party cloud-based software applications are no longer scalable, which, combined with increased regulation around patient data security, make it almost impossible to combine datasets.

Lifebit's co-founders Chatzou Dunford and Pablo Prieto Barja knew the pain points faced by researchers, having worked on projects, including ENCODE at the Centre for Genomic Regulation in Barcelona[1]. It was there they co-developed Nextflow, now one of the most widely used software solutions for orchestrating scientific workflows that powers the majority of organisations performing population-scale genomic analysis. Lifebit was founded in 2017 and has quickly cemented itself as a biotech to watch, raising $60 million in its recent series B funding round and now scaling globally.

Lifebit's key market differentiator lies in its patented, federated technology, an architecture that allows researchers to bring analytics and computing tools to the data, rather than moving data into a centralised location (Fig. 1). In doing so it allows the data custodians to stay in control at all times, but also to connect with other cohorts from around the world. Lifebit builds federated Trusted Research Environments (TREs) that are set up within a client's secure cloud or on-premise computing infrastructure, allowing data to be combined and analysed with other TREs without the need for data to be copied or moved.

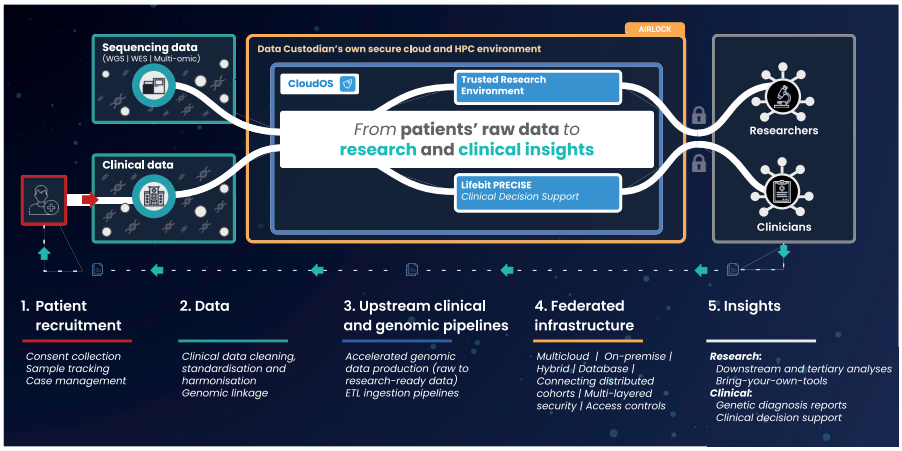

Fig. 1 | The timeline from raw data to insights. The Lifebit CloudOS platform safely shares clinico-genomic data to advance drug discovery and precision medicine.

Maximizing data value with collaborations

Lifebit works with top pharma companies and government-led biobank initiatives around the world to build scalable data, analytics, and infrastructure platforms. These allow customers to maximize the value of their clinico-genomic data by enabling secure access and combining this data with that of other biobanks and clinical databases globally. In 2021, the company secured a four-year contract to support the Hong Kong Genome Institute (HKGI) in implementing its first large-scale genome sequencing initiative. And in March last year it began a partnership with pharma company Boehringer Ingelheim with a mission to connect the firm's own datasets with those of many biobank collaborations worldwide. These new partnerships are in addition to established collaborations with the UK's National Institute of Health Research (NIHR) Cambridge Biomedical Centre.

Lifebit also has an ongoing relationship with Genomics England since 2020. The company, owned by the UK government's Department of Health and Social Care, has pioneered genomic medicine, having sequenced 100,000 genomes to support research into cancer and rare disease therapeutics. At the start of the COVID-19 pandemic, Genomics England sequenced an additional 35,000 whole genomes with clinical information from around hospitals around the UK. To support this endeavor, Lifebit set up a TRE that allowed academic researchers and pharma companies to gain secure access to Genomics England data to develop treatments and vaccines, and probe the underlying genetic variations that may explain why COVID-19 severity varies so greatly between patients. "Now Genomics England end users don't need to run an analysis in five different environments. They can go into our Genomics England TRE and carry out genome-wide association studies over distributed data," said Chatzou Dunford.

Lifebit is looking to bring its 'precision medicine blueprint' to national biobanks and pharmaceutical company research initiatives worldwide. "This blueprint can work with large-scale data challenges—we provide an end-to-end solution to handle the unique challenges around security, access controls, analyses and infrastructure, no matter whether the data is stored on premise, in the cloud or a hybrid. There are no challenges Lifebit has not solved," she added of the company's track record so far. Lifebit's ultimate goal is to be able to democratise access to data to enable more collaborative research, driving faster genomic insights and more effective drug discovery pipelines.

1. Yue, F. et al. *Nature* **515**, 355–364 (2014).

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