

# SureSelect CD Monkeypox Panel

Innovation powered by you



Judith Breuer

Professor of Virology Co-Director,  
Division of Infection and Immunity Head,  
UCL Research Department of Infection,  
Division of Infection and Immunity,  
University College London

*"SureSelect target enrichment enables highly efficient whole viral genome sequencing without the need for prior culture or PCR. The robust and consistent performance of SureSelect is why we've been depending on it for over 10 years."*

Monkeypox, a viral zoonosis, is a disease of global public health importance and presents with symptoms similar to smallpox, although less severe and not usually fatal.<sup>1</sup> The causative pathogen is the Monkeypox virus (MPV, MPXV, or hMPXV), a double-stranded DNA orthopoxvirus belonging to the family Poxviridae.<sup>1</sup>

Sequencing of the genome in 2001 revealed a size of approximately 200 Kb and a GC content of 31.1%, similar to other orthopoxviruses.<sup>2</sup> There are two distinct genetic clades of the Monkeypox virus: the central African (Congo Basin) clade and the west African clade.

In May 2022, multiple cases of Monkeypox were identified in several non-endemic countries. Studies are currently underway to further understand the epidemiology, sources of infection, and transmission patterns. The ability to perform whole genome sequencing of viruses directly from clinical samples is important for understanding the genetics of host-pathogen interactions, epidemiological tracing, and monitoring outbreaks.

## SureSelect Community Design Monkeypox Panel

Due to the much smaller size of viral genomes when compared to the human genome, the proportion of host nucleic acid in an extract massively outweighs that of viral nucleic acid. To overcome this, the research group led by Professor Judith Breuer at University College London (UCL) has pioneered the enrichment and sequencing of whole viral genomes directly from clinical research material using custom Agilent SureSelect NGS panels.<sup>3</sup> Professor Breuer has now applied this expertise to the challenge of Monkeypox.

To study cases of Monkeypox, Professor Breuer's team at UCL have designed a Monkeypox bait set for targeted enrichment of Monkeypox from the host genome. The features of this bait set are shown in Table 1.

## The SureSelect Community Design Monkeypox Panels are Supported By the Streamlined and Automated NGS Workflow from Agilent

These Monkeypox bait sets are compatible with the market leading Agilent SureSelect XT, XT HS, XT HS2, and XT Low Input protocols, with 1:10 dilution of the probe libraries along with other modifications recommended by Professor Breuer's group. Both fast and overnight bait options are available ensuring the best performance for your specific workflow.

Please refer to the application note: "Utilization of Agilent SureSelect Target Enrichment for Whole Genome Sequencing of Viruses and Bacteria" (5994-0909EN) authored by Professor Breuer's group for further details prior to ordering these panels.<sup>3</sup> The SureSelect XT HS and XT Low Input workflows can also be easily automated on both the Agilent Bravo and Magnis NGS Prep systems for sample automation and rapid turnaround time of results.

**Table 1.** Features of the Agilent Community Design Monkeypox Virus bait set.

<b>Design size</b>	230 Kb
<b>Boosting</b>	For fast hybridization or overnight hybridization (see Table 2 details)
<b>Target Pathogen</b>	Human Monkeypox virus
<b>Creation Date</b>	May 2022
<b>Reference Genome</b>	102 Monkeypox genomes available in May 2022
<b>Amount of Sequencing Needed</b>	Current recommendations are 24 samples per MiSeq run, but as we learn more about the virus, this may change and will require customer validation
<b>Special Notes</b>	This panel is used at 10-fold dilution of the probes <sup>3</sup>

## References

1. Monkeypox. Who.int. <https://www.who.int/news-room/fact-sheets/detail/monkeypox> (accessed 2022-09-19).
2. Shchelkunov, S. N.; Totmenin, A. V.; Babkin, I. V.; Safronov, P. F.; Ryazankina, O. I.; Petrov, N. A.; Gutorov, V. V.; Uvarova, E. A.; Mikheev, M. V.; Sisler, J. R.; Esposito, J. J.; Jahrling, P. B.; Moss, B.; Sandakhchiev, L. S. Human Monkeypox and Smallpox Viruses: Genomic Comparison. *FEBS Lett.* **2001**, 509 (1), 66–70. [https://doi.org/10.1016/s0014-5793\(01\)03144-1](https://doi.org/10.1016/s0014-5793(01)03144-1)
3. Williams, R.J.; Tutill, H.; Roy, S.; Romero, E.Y.; Williams, C.A. Breuer, J.; Depledge, D. Utilization of Agilent SureSelect Target Enrichment for whole genome sequencing of viruses and bacteria. Agilent Application Note. **2019**, PN 5994-0909EN.

[www.agilent.com](http://www.agilent.com)

Agilent has not performed verification and validation on these panels.

For Research Use Only. Not for use in diagnostic procedures.

PR7001-0156

This information is subject to change without notice.

© Agilent Technologies, Inc. 2022  
Published in the USA, December 01, 2022  
5994-5482EN

The Agilent Community Design Monkeypox panel combines both the expertise of the UCL Pathogen Sequencing Unit and the excellent Agilent capture workflow to allow the investigation of Monkeypox.

**Table 2.** Ordering information for the SureSelect Community Design Monkeypox panel.

*Note: part numbers cover the capture probe libraries only. Library prep and target enrichment kits must be purchased separately.*

Part Number	Product Description
5282-0025	SureSelect CD Monkeypox (Fast Hyb)
5282-0026	SureSelect CD Monkeypox