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Published online: 18 June 2020

<https://doi.org/10.1038/s41587-020-0588-y>

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Acknowledgements

The authors wish to thank Heather Ringrose for support with the Hamilton liquid handling workstation. This work was supported by the Francis Crick Institute, which receives its core funding from Cancer Research UK (FC001169, FC001078), the UK Medical Research Council (FC001169, FC001078) and the Wellcome Trust (FC001169, FC001078). C.S. is Royal Society Napier Research Professor and is also funded by the Breast Cancer Research Foundation. E.N. receives research funding from the NIHR, MRC, GSK and H2020. S. Gandhi is an MRC Senior Clinical Fellow.

Competing interests

C.S. receives grant support from Pfizer, AstraZeneca, Bristol-Myers Squibb (BMS), Roche-Ventana, Boehringer-Ingelheim and Ono Pharmaceutical and has consulted or received an honorarium from Pfizer, Novartis, GlaxoSmithKline, Merck Sharp & Dohme, BMS, Celgene, AstraZeneca, Illumina, Genentech, Roche-Ventana, GRAIL, Medici and the Sarah Cannon Research Institute. C.S. is a shareholder of Apogen Biotechnologies, Epic Bioscience and GRAIL and has stock options in and is a cofounder of Achilles Therapeutics. M. Hubank has received laboratory support, consultancy fees or advisory board membership from Guardant Health, Roche Diagnostics, Boehringer-Ingelheim, BMS and AstraZeneca.

Additional information

Supplementary information is available for this paper at <https://doi.org/10.1038/s41587-020-0588-y>.

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