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This form is used to ensure compliance with Nature Research editorial policies related to research ethics and reproducibility. For further information, please see our [editorial policies](#) site. All relevant questions on the form must be answered.

Competing interests

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Competing interests declaration

In the interest of transparency and to help readers form their own judgements of potential bias, Nature Research journals require authors to declare any competing financial and/or non-financial interest in relation to the work described in the submitted manuscript.

- ☐ We declare that none of the authors have competing financial or non-financial interests as defined by Nature Research.
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Dr. Lubitz receives sponsored research support from Bristol-Myers Squibb / Pfizer, Bayer AG, Biotronik, and Boehringer Ingelheim, and has consulted for Bristol-Myers Squibb and Bayer AG. Dr. Ellinor receives sponsored research support from Bayer AG and IBM, and he has consulted for Bayer AG, Novartis, and MyoKardia, and Quest Diagnostic. Dr. Philippakis is also employed as a Venture Partner at GV and consulted for Novartis; and has received funding from Intel, Verily and MSFT. Dr. Batra serves as a consultant for Novartis. Dr. Khera has served as a scientific advisor to Sanofi, Amgen, Maze Therapeutics, Navitor Pharmaceuticals, Sarepta Therapeutics, Novartis, Verve Therapeutics, Silence Therapeutics, Veritas International, Color Health, Third Rock Ventures, and Columbia University (NIH); received speaking fees from Illumina, MedGenome, Amgen, and the Novartis Institute for Biomedical Research; and received a sponsored research agreement from the Novartis Institute for Biomedical Research. Drs. Kartoun, Kwon, and Ng are employees of IBM. The remaining authors have no disclosures.

Authorship

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Prior to submission all listed authors must agree to all manuscript contents, the author list and its order and the author contribution statements. Any changes to the author list after submission must be approved by all authors.

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- Accession codes, unique identifiers, or web links for publicly available datasets
- A list of figures that have associated raw data
- A description of any restrictions on data availability

- ☒ We have provided a full data availability statement in the manuscript.

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Confirm that all relevant data are deposited into a public repository and that accession codes are provided.

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Code availability statement

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For all data presented in a plot, chart or other visual representation confirm that:

n/a | Confirmed

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- ☒ ☐ Box-plot elements are defined (e.g. center line, median; box limits, upper and lower quartiles; whiskers, 1.5x interquartile range; points, outliers)
- ☐ ☒ Clearly defined error bars are present and what they represent (SD, SE, CI) is noted

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Does not apply

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- | | |
|-------------------------------------|---|
| ☒ | ☐ Macromolecular structural data |
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| ☒ | ☐ Human embryos, gametes and/or stem cells |
| ☐ | ☒ Human research participants |
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Human research participants

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☒ We have complied with all relevant ethical regulations and include a statement affirming this in the manuscript.

Ethics committee

Confirm that the manuscript states the name(s) of the board and/or institution that:

☒ Approved the study protocol -OR- ☐ Provided guidelines for study procedures (if protocol approval is not required)

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☒ We have obtained informed consent from all participants and this is noted in the manuscript.

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Typed signature Uri Kartoun Date Oct 4, 2021