nature research

Corresponding author(s): Ishac Nazy (nazyi@mcmaster.ca)

Last updated by author(s): Jun 13, 2021

Reporting Summary

Nature Research wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Research policies, see our Editorial Policies and the Editorial Policy Checklist.

Please do not complete any field with "not applicable" or n/a. Refer to the help text for what text to use if an item is not relevant to your study.
For final submission: please carefully check your responses for accuracy; you will not be able to make changes later.

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a	Confirmed	
☐	☒	The exact sample size (*n*) for each experimental group/condition, given as a discrete number and unit of measurement
☐	☒	A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
☐	☒	The statistical test(s) used AND whether they are one- or two-sided *Only common tests should be described solely by name; describe more complex techniques in the Methods section.*
☒	☐	A description of all covariates tested
☒	☐	A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons
☐	☒	A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals)
☐	☒	For null hypothesis testing, the test statistic (e.g. *F*, *t*, *r*) with confidence intervals, effect sizes, degrees of freedom and *P* value noted *Give P values as exact values whenever suitable.*
☒	☐	For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings
☒	☐	For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes
☒	☐	Estimates of effect sizes (e.g. Cohen's *d*, Pearson's *r*), indicating how they were calculated

Our web collection on statistics for biologists contains articles on many of the points above.

Software and code

Policy information about availability of computer code

Data collection	Biolayer interferometry (BLI) data was collected using the Octet® User Software version 3.1
Data analysis	All statistical analyses were conducted using GraphPad Prism (version 9.1.0, GraphPad Software)

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Research guidelines for submitting code & software for further information.

Data

Policy information about availability of data

All manuscripts must include a data availability statement. This statement should provide the following information, where applicable:

- 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

The datasets generated during and/or analysed during the current study are not publicly available to allow for commercialization of research findings but are available from the corresponding author (Dr. Ishac Nazy) on reasonable request.

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

☒ Life sciences ☐ Behavioural & social sciences ☐ Ecological, evolutionary & environmental sciences

Life sciences study design

All studies must disclose on these points even when the disclosure is negative.

Sample size	No sample size calculations were performed. The sample sizes used in the study are sufficient as both vaccine-induced thrombotic thrombocytopenia and heparin-induced thrombocytopenia are rare disorders and it is difficult to acquire clinically defined patient samples. Sample size was determined based on the availability of positive VITT samples sent for testing at the McMaster Platelet Immunology Laboratory during the month of April.
Data exclusions	No datasets were excluded.
Replication	All assays were run with technical duplicates. Each assay had the same control sample run alongside all test subjects. Two heparin-induced thrombocytopenia samples and one vaccine-induced thrombotic thrombocytopenia were run in every assay on two separate occasions. Experiments were repeated with technical duplicates independently two times with similar results.
Randomization	Allocation was not randomized. Groups were defined by clinical diagnosis. Covariates were controlled by inspection of clinical data on each patient to ensure that there was no disorder overlap or any other diagnoses that could confound the data.
Blinding	Investigators were not blinded to group allocation during analysis. Blinding was not relevant to the study as all samples were run through every assay without discrimination.

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

n/a	Involved in the study
☐	☒ Antibodies
☒	☐ Eukaryotic cell lines
☒	☐ Palaeontology and archaeology
☒	☐ Animals and other organisms
☐	☒ Human research participants
☒	☐ Clinical data
☒	☐ Dual use research of concern

Methods

n/a	Involved in the study
☒	☐ ChIP-seq
☒	☐ Flow cytometry
☒	☐ MRI-based neuroimaging

Antibodies

Antibodies used	Primary antibodies - VITT and HIT patient sample, healthy control samples (concentration 1/50 dilution) Secondary antibody - Alkaline-phosphatase conjugated goat anti-human IgG (γ-chain-specific, Jackson ImmunoResearch Laboratories, Inc, Westgrove, PA, USA), cat. no 109-056-098, lot no. 143072 (1/3,000 dilution)
Validation	VITT and HIT patient samples were selected from patients with confirmed diagnosis from the Platelet Immunology Laboratory. HIT patient samples were further confirmed clinically by an expert hematologist. Secondary antibody concentration used were based on previous optimizations by the lab found in the following reference: Horsewood, P. et al. Br J Haematol (1996). The secondary antibodies were validated by the manufacturer (see link https://www.jacksonimmuno.com/catalog/products/109-056-098). In summary, the antibody has been tested by ELISA and/or solid-phase absorbed to ensure minimal cross-reaction with bovine, horse, and mouse serum proteins.

Human research participants

Policy information about studies involving human research participants

Population characteristics	VITT patients (n = 5) had a mean age of 44 years (range: 35 – 72) and 2/5 were female. The time from first dose of the ChAdOx1 nCoV-19 vaccine to sample collection 14 to 40 days (mean 28 days). HIT patients (n=10) had a mean age of 69 years

	(range: 52 – 81 years) and 5/10 were female. Nine of 10 HIT patients (90%) experienced thrombosis. The time from heparin initiation to sera collection was 6 – 27 days (mean 14.3 days).
Recruitment	Sera from patients with vaccine-induced thrombotic thrombocytopenia and heparin-induced thrombocytopenia were referred to the McMaster Platelet Immunology Laboratory for confirmatory diagnosis. We tested consecutive samples as they came in. It is possible that there is self-selection bias as the samples sent for testing may be extreme cases of VITT in terms of clinical features.
Ethics oversight	Hamilton Integrated Research Ethics Board (HiREB)

Note that full information on the approval of the study protocol must also be provided in the manuscript.