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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.

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	Hioki LCR Sample Application; Hioki HiTESTER; Keysight GUI Data Logger Software For Handheld LCR Meter; Finapres® NOVA, Visual Studio
Data analysis	MS Excel, Origin Pro, MATLAB, Python 3

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 complete dataset supporting the findings of this study is available in PhysioNet data repository. The associated pre-processed raw data is available and can be shared with interested parties upon 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

For a reference copy of the document with all sections, see nature.com/documents/nr-reporting-summary-flat.pdf

Life sciences study design

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

Sample size	N=7 subjects have participated in the study. N=6 of the participants have performed HGCP experimental routine, which consists of at least 5, up to 7 repetitive sets of measurements. Each measurement set is split into 4-5 iterations, approximately 90 seconds each. The calibration Finapres Nova was running interchangeably, with measurements stopped every 15-20 minutes because of the pressure applied onto subject's finger, and time was given for subjects to ease up. N=5 subjects performed Valsalva maneuver and N=1 subject performed cycling exercise. During impedance measurements, at least three tattoos of each kind were were used as a single set, recording three pairs: 1-2, 1-3, and 2-3. Each time the sweep was performed three times with 10 sec interval.
Data exclusions	Occasionally, the extensive pressure applied by the finapres NOVA's finger cuff, and possible misplacement of the reader, have resulted in conditionally wrong collection of "training/true" data. When at rest conditions we saw the DBP values above 140 and SBP values above 160, those trials were excluded from the evaluation.
Replication	Each subject's BP and Bio-Z was measured at minimum 5 times, each with 4-5 iterations, approximately 90 seconds each. Two sets of each graphene type (multuple GETs per type) were used to perform graphene tattoo characterization study.
Randomization	Not applicable.
Blinding	Not applicable.

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

Human research participants

Policy information about studies involving human research participants

Population characteristics	Total N=7 presumably healthy subjects (age 18-35) participated in the study, N=6 male and N=1 female.
Recruitment	The recruitment was performed in full accordance to the IRB protocol.
Ethics oversight	Institutional Review Board of the Texas A&M University (IRB no. IRB2017-0335D) Institutional Review Board of the University of Texas at Austin (IRB no. 2018-06-0058)

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