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.

- 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
- 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

No specific software was used for data collection.

Data analysis

SPSS version 25 was used for statistical analyses.

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

Data are available and can be requested by sending the corresponding author an e-mail with a short motivation.
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.

- [x] 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 | 906 |
| Data exclusions | No data were excluded from the analysis. |
| Replication | No specific measure were taken to assess replication. |
| Randomization | Given the aims of the study randomization was not applicable. |
| Blinding | Given the aims of the study blinding was 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 |
| --- | --- |
| [x] Antibodies |
| [x] Eukaryotic cell lines |
| [x] Palaeontology and archaeology |
| [ ] Animals and other organisms |
| [ ] Human research participants |
| [ ] Clinical data |
| [ ] Dual use research of concern |

**Methods**

| n/a | Involved in the study |
| --- | --- |
| [x] ChIP-seq |
| [x] Flow cytometry |
| [x] MRI-based neuroimaging |

Human research participants

Policy information about studies involving human research participants

Population characteristics | COPD patients from primary (n=289), secondary (n=184) and tertiary care (n=433) patient cohorts. |
Recruitment | Convenient samples were used. |
Ethics oversight | We applied the Code of Conduct for Medical Research issued by the Dutch Council of the Federation of Medical Scientific Societies to this research. Because the NCSI and demographic and clinical data were collected as a part of routine patient care and no intervention or course of action was imposed on patients no ethics approval was required. Patients could refuse the use of their de-identified data for scientific research purposes and have their data removed from the research database. |

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

Clinical data

Policy information about clinical studies

All manuscripts should comply with the ICMJE guidelines for publication of clinical research and a completed CONSORT checklist must be included with all submissions.

Clinical trial registration | Not applicable. |
Study protocol | Not applicable. |
Data collection | Data were collected as a part of routine patient care between 2012 and 2107. |
Outcomes

Health status as measured by the Nijmegen Clinical Screening Instrument