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Life Sciences Reporting Summary

Nature Research wishes to improve the reproducibility of the work we publish. This form is published with all life science papers and is intended to promote consistency and transparency in reporting. All life sciences submissions use this form; while some list items might not apply to an individual manuscript, all fields must be completed for clarity.

For further information on the points included in this form, see Reporting Life Sciences Research. For further information on Nature Research policies, including our data availability policy, see Authors & Referees and the Editorial Policy Checklist.

Experimental design

1. Sample size

   Describe how sample size was determined.

   Cell culture: In each experiment, the cell-well numbers (4) was based on the literature reported procedure. Significance was accepted at $p<0.05$. Animals: In each experiment, the animal numbers was based on power analysis with a typical 15% SD in this model and we seek to see a 20% difference to be considered significant. All data are expressed as the mean +/- standard deviation. Differences in measured variables between experimental and control groups were assessed by Student t-test and ANOVA. Calculations were done on a Mac using the statistical software Instat(Graphpad software) and Excel. Significance was accepted at $p<0.05$. Additionally, we have over 10 years of historical experience with this model that is also well characterized and referenced in the literature.

2. Data exclusions

   Describe any data exclusions.

   no data was excluded

3. Replication

   Describe whether the experimental findings were reliably reproduced.

   Cell culture: cytotoxicity analysis and ELISA studies are very general assay and we exactly followed the protocol to do those assays.
   Animals: Acetaminophen toxicity is a standard model in our laboratory that we have used over the past 10 years and tested in hundreds of mice and highly reproducible liver injury.

4. Randomization

   Describe how samples/organisms/participants were allocated into experimental groups.

   Cell culture: Cell incubated in T75 flask were randomized separated incubated in 96-well-plate.
   Animals: Mice were randomized by having one researcher select the mice from the total group and handing them to the researcher performing the injections in the mice who was unaware of the cage origin and what was being administered.

5. Blinding

   Describe whether the investigators were blinded to group allocation during data collection and/or analysis.

   Cell culture:Three individuals participated in the experiments. Each of them performed the experiments at different times.
   Animals: Two individuals participated in the experiments. One was responsible for preparing the reagents and then selecting the mice and handing them to the second researcher who performed the injections.

Note: all studies involving animals and/or human research participants must disclose whether blinding and randomization were used.

6. Statistical parameters

For all figures and tables that use statistical methods, confirm that the following items are present in relevant figure legends (or the Methods section if additional space is needed).

n/a	Confirmed	
☐	☒	The exact sample size (*n*) for each experimental group/condition, given as a discrete number and unit of measurement (animals, litters, cultures, etc.)
☐	☒	A description of how samples were collected, noting whether measurements were taken from distinct samples or whether the same sample was measured repeatedly.
☐	☒	A statement indicating how many times each experiment was replicated
☐	☒	The statistical test(s) used and whether they are one- or two-sided (note: only common tests should be described solely by name; more complex techniques should be described in the Methods section)
☐	☒	A description of any assumptions or corrections, such as an adjustment for multiple comparisons
☐	☒	The test results (e.g. *p* values) given as exact values whenever possible and with confidence intervals noted
☐	☒	A summary of the descriptive statistics, including central tendency (e.g. median, mean) and variation (e.g. standard deviation, interquartile range)
☐	☒	Clearly defined error bars

See the web collection on statistics for biologists for further resources and guidance.

Software

Policy information about availability of computer code

7. Software

Describe the software used to analyze the data in this study.	Instat (Graphpad software), Gaussian and Excel

For all studies, we encourage code deposition in a community repository (e.g. GitHub). Authors must make computer code available to editors and reviewers upon request. The *Nature Methods* guidance for providing algorithms and software for publication may be useful for any submission.

Materials and reagents

Policy information about availability of materials

8. Materials availability

Indicate whether there are restrictions on availability of unique materials or if these materials are only available for distribution by a for-profit company.	all materials are available

9. Antibodies

Describe the antibodies used and how they were validated for use in the system under study (i.e. assay and species).	The antibodies used in this study were purchased from eBioscience (Product code: 88-7324-76). Each lot of the product has passed the quality control test before it can be sold by the manufacture. Each assay was performed according to the manufacture's instruction. A standard curve was obtained in each assay to further validate the antibodies' performance.

10. Eukaryotic cell lines

a. State the source of each eukaryotic cell line used.	The cell lines used in this study were purchased from ATCC:HeLa (ATCC® CCL-2™); RAW 264.7 (ATCC® TIB-71™)
b. Describe the method of cell line authentication used.	STR Profiling
c. Report whether the cell lines were tested for mycoplasma contamination.	Yes
d. If any of the cell lines used in the paper are listed in the database of commonly misidentified cell lines maintained by ICLAC, provide a scientific rationale for their use.	n/a

Animals and human research participants

Policy information about studies involving animals; when reporting animal research, follow the ARRIVE guidelines

11. Description of research animals

Provide details on animals and/or animal-derived materials used in the study.	Male CD-1 mice weighing 25-30g and 6-8weeks of age were fasted overnight to increase relevant liver metabolic cytochromes that lead to degradation of acetaminophen that results in liver damage. All procedures were approved by the Beth Israel Deaconess Medical Center (BIDMC).

Policy information about studies involving human research participants

12. Description of human research participants

Describe the covariate-relevant population characteristics of the human research participants.	n/a