



HAL
open science

Effects of low dose radiation on atherosclerosis in APOE(-/-) mice: study of short term effects on macrophage polarization

Nicolas Rey, Talin Ebrahimian, Celine Gloaguen, Dimitri Kereselidze, Christelle Demarquay, Karl Balabanian, Imene Garali Zineddine, M Abdelouahab, Dmitry Klokov, Stephanie Lehoux, et al.

► To cite this version:

Nicolas Rey, Talin Ebrahimian, Celine Gloaguen, Dimitri Kereselidze, Christelle Demarquay, et al.. Effects of low dose radiation on atherosclerosis in APOE(-/-) mice: study of short term effects on macrophage polarization. ERPW21 - 5th European Radiation Protection Week, Nov 2021, Vienne, Austria. . hal-04021267

HAL Id: hal-04021267

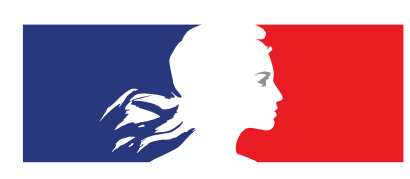
<https://hal.science/hal-04021267>

Submitted on 30 Mar 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Copyright



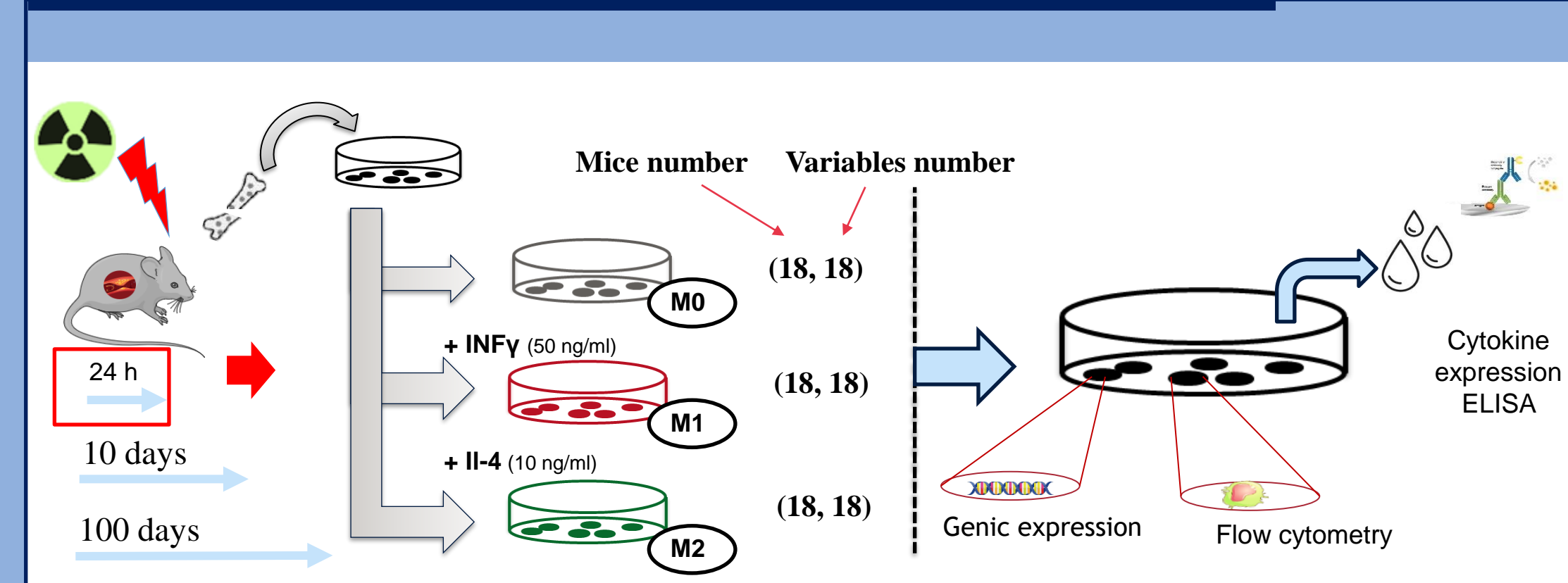
EFFECTS OF LOW DOSE Γ RADIATION ON ATHEROSCLEROSIS IN APOE(-/-) MICE: STUDY OF SHORT TERM EFFECTS ON MACROPHAGE POLARIZATION .

¹N. REY, ²T. EBRAHIMIAN, ¹C. GLOAGUEN, ¹D. KERESLIDZE, ¹C. DEMARQUAY, ³K. BALABANIAN, ¹I. GARALI ZINEDDINE, ¹M. ABDELOUAHAB, ¹D. KLOKOV, ²S. LEHOUX*, ¹T.G. EBRAHIMIAN*.

I. Study objective

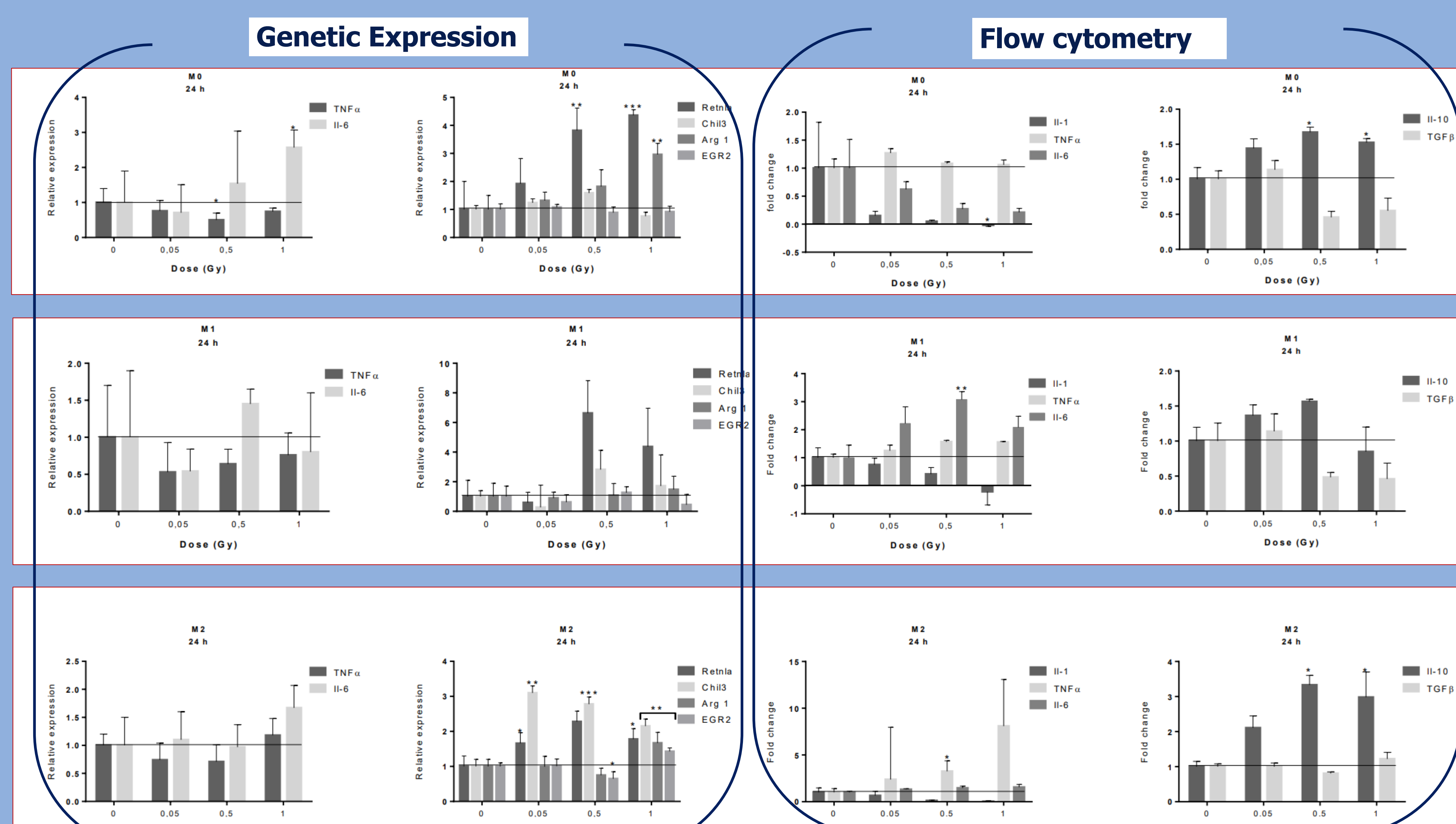
Atherosclerosis is a chronic inflammatory disease of medium and large arteries that can lead to myocardial infarction or stroke. Mechanistic understanding of the effects of low-dose ionizing radiation (LDIR) on atherosclerosis remains incomplete. The experimental studies have shown a protective effect of LDIR on atherosclerosis in rodent models. However early responses of LDIR in different cell types that are known to be involved in atherosclerosis is not clear. The objective is to understand biological mechanisms of LDIR include on experimental animal groups with multimodal approach. In this study, we report results of applying the fold-change, usually considered a relevant criterion for stating difference and similarity between measurements and a multilevel multivariate approach. Revealing complex correlations and causal links related to health conditions, such as atherosclerosis, can help advance the concept adverse outcome pathway (AOP).

Study Design



Study Results

24h ← 1) Fold change vs control mice

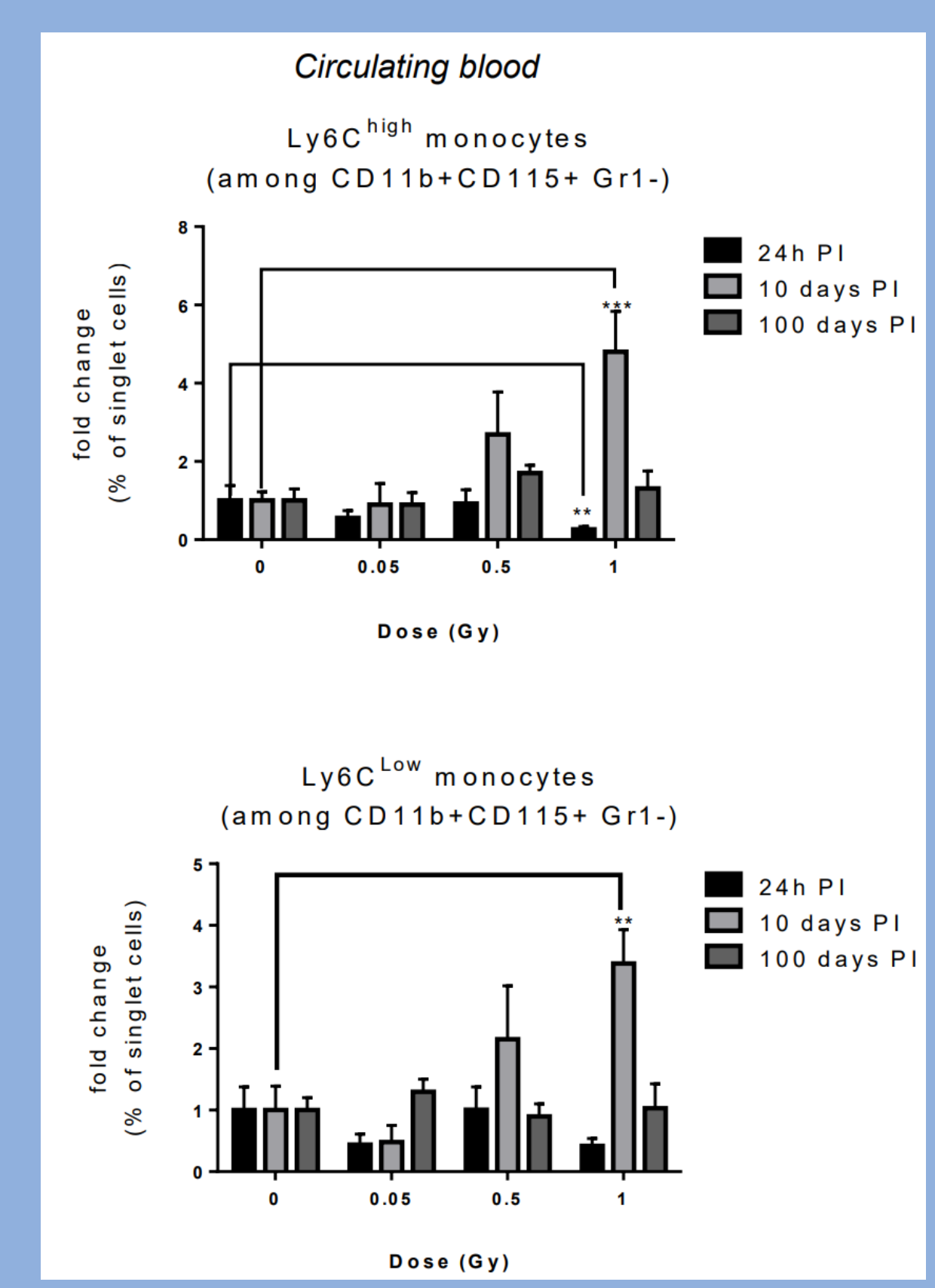


M0

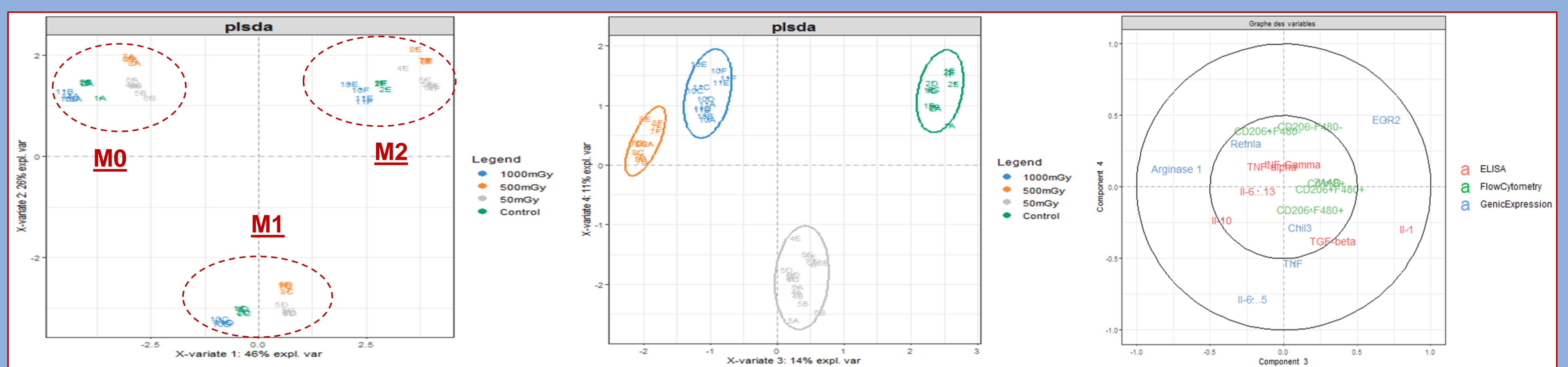
M1

M2

24h
10Days
100Days



2) Multilevel multivariate approach (24h)



Conclusion

We found a significant dose-dependent increase of genic expression of Chil-3 and Retnla anti-inflammatory markers in M0 and M2 type macrophages upon 24 hours exposure and no effects on M1 types. These effects were associated with a dose-dependent increase of IL-10 and reduction of IL-1 secretions in M0 and M2 and an increase of IL-6 in M1 type macrophages. Circulating pro-inflammatory Ly6C^{High} monocytes were reduced at 24 hours and anti-inflammatory Ly6C^{Low} monocytes were notably increased in the spleen 100 days upon irradiation.