

Pulse-modulated 1800 MHz electromagnetic fields affect microglial cell responses triggered by lipopolysaccharide

Michel Mallat, Julie Lameth, Annie Gervais, Catherine Colin, Philippe Lévêque, Delia Arnaud-Cormos, Thérèse Jay, Jean-Marc Edeline

▶ To cite this version:

Michel Mallat, Julie Lameth, Annie Gervais, Catherine Colin, Philippe Lévêque, et al.. Pulse-modulated 1800 MHz electromagnetic fields affect microglial cell responses triggered by lipopolysac-charide. GLIA Edinburgh 2017, Jul 2017, Edinburgh, United Kingdom. pp.105-123, 10.1007/s12640-020-00191-3. hal-02465515

HAL Id: hal-02465515 https://hal.science/hal-02465515v1

Submitted on 16 Nov 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.

Abstract submission account

Abstract preview

Pulse-modulated 1800 MHz electromagnetic fields affect microglial cell responses triggered by lipopolysaccharide

 $\underline{\mathbf{M}}$. $\underline{\mathbf{M}}$ $\underline{\mathbf$

- ¹ Sorbonne Universités, UPMC Univ Paris 06, INSERM, CNRS, Institut du cerveau et de la moelle (ICM), Paris, France
- 2 Univ. Limoges, CNRS, XLIM, UMR 7252, F-87000 Limoges, France
- 3 Psychiatry and Neurosciences Center, UMR_S 894 INSERM, Paris, France 4 Neuro-PSI Paris Saclay Institute of Neuroscience,UMR 9197 CNRS & Université Paris-Sud, Orsay, France

The extensive use of wireless communications has motivated investigations that aim at characterizing biological effects of electromagnetic fields (EMF) belonging to the radiofrequency (RF) spectrum. Many studies have probed responses of the healthy CNS exposed to these EMF but the EMF effects on brains affected by pathological processes remain seldom investigated. In the current study, our goal was to determine whether pulse-modulated 1800 MHz EMF used in the Global System for Mobile Phone Communication (GSM) could affect microglial proinflammatory responses triggered by lipopolysaccharide (LPS) in vivo or ex vivo. Adult rats were injected ip with LPS (250 ug/kg) 24h before a 2h "head only" exposure to GSM EMF. Dosimetric analyses showed that the specific absorption rate of $\,$ RF averaged 2.9 W/kg $\,$ in the dorsomedial part of the cerebral cortex. Cortical cell responses unfolding after the exposure to RF were assessed by immunohistochemistry and RT-qPCR analyses. Comparison of GSM- and sham-exposed animals revealed that the RF triggered a significant and transient down regulation of the IL-1ß gene, accompanied by an increase in the spatial coverage of microglial cell processes. We also found that purified microglial cells stimulated with LPS were responsive to GSM EMF, as indicated by significant reductions in the levels of microglial transcripts encoding M1 proinflammatory markers. Together, our data provide evidence that GSM EMF can interfere with proinflammatory cell responses triggered in microglia.

Acknowledgement

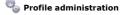
This work was supported by the French National Research Program for Environmental and Occupational Health of ANSES (grants 2013/2/03 and 2015/2 RF/12).

Keywords:

Topics:Cytokine production, Topics:Immune Function, Topics:Microglial cells

Contributions







Helpdesk

+49 351 30900031 abstract@eventclass.com

Important dates

Call for abstracts November 1, 2016 opens

Deadline for abstract February 1, 2017

submission Final program May 2017

available

Contact

GLIA 2017 Meeting Secretariat

info@glia2017.eu

powered by contxt - @ 2017/2018 EventClass GmbH

1 sur 1 31/01/17 16:42