



Altered Lipid Profile in Glioma Patients Affects the Activity of Drug-Metabolizing Enzymes

Jia YU ^{1#}, Xuefeng SHEN ^{2#}, Liang WANG ¹, Yongji TIAN ³, Xing YANG ¹,
Fuqiang FENG ¹, Miao LOU ¹, Zhen WANG ⁴, Yanyang TU ^{4*} & Jianping DENG ^{1*}

¹ Department of Neurosurgery & ⁴ Department of Experimental Surgery,
Tangdu Hospital, Fourth Military Medical University, Xi'an 100050 China

² Department of Occupational & Environmental Health and the Ministry of Education Key Lab of Hazard
Assessment and Control in Special Operational Environment, School of Public Health,

Fourth Military Medical University, Xi'an 710032, China

³ Department of Neurosurgery, Tiantan Hospital, Capital Medical University, Beijing 710038 China

SUMMARY. Glioma remains to be the severe disease to threaten the human health. The present study aims to determine the lipid profile alteration in the patients with glioma, and the influence of altered lipid components towards the activity of drug-metabolizing enzymes UDP-glucuronosyltransferases (UGTs). Serum samples were collected from the healthy volunteers and the patients with glioma. Lipidomics analysis showed the significant elevation of LPC18:0 and LPC18:1 in patients with glioma. The influence of lipid components LPC18:0 and LPC 18:1 towards UDP-glucuronosyltransferases (UGTs) was investigated using recombinant UGTs-catalyzed 4-MU probe reaction, and the results showed that LPC18:0 and LPC18:1 activate the activity of UGT1A1, and inhibited the activity of UGT1A6 and UGT1A8. In conclusion, the present study used lipidomics analysis method to find the significant change of LPC18:0 and LPC18:1 in the patients with glioma. LPC18:0 and LPC18:1 were furtherly demonstrated to exert regulation effect towards UGT isoforms. It was demonstrated that altered lipid profile in glioma patients affects the activity of drug-metabolizing enzymes.

RESUMEN. El glioma sigue siendo una enfermedad grave que pone en peligro la salud humana. El presente estudio tiene como objetivo determinar la alteración del perfil lipídico en los pacientes con glioma, y la influencia de los componentes lípidos alterados hacia la actividad de enzimas que metabolizan drogas como las UDP-glucuronosiltransferasas (UGT). Las muestras de suero se obtuvieron de voluntarios sanos y pacientes con glioma. El análisis lipidómico mostró la elevación significativa de LPC18:0 y LPC18:1 en pacientes con glioma. La influencia de estos componentes lipídicos sobre las UDP-glucuronosiltransferasas (UGTs) se investigó usando UGTs recombinantes en reacciones catalizada por la sonda 4-MU; los resultados mostraron que LPC18:0 y LPC18:1 estimulan la actividad de UGT1A1 e inhiben la actividad de UGT1A6 y UGT1A8. En conclusión, el presente estudio utilizó el método de análisis lipidómico para detectar el cambio significativo de LPC18:0 y LPC18:1 en pacientes con glioma. LPC18:0 y LPC18:1 demostraron ejercer efecto de regulación sobre isoformas de la UGT. Se demostró que el perfil lipídico alterado en pacientes con glioma afecta a la actividad de las enzimas metabolizadoras de fármacos.

KEY WORDS: glioma, lipidomics, drug-metabolizing enzymes

These two authors equally contributed to this work.

* Author to whom correspondence should be addressed. E-mail: tufmmu@188.com and 1272248612@qq.com