Food grade titanium dioxide (E171) induces systemic toxicity in mice fed with a high fat diet



Medina-Reyes EI[1], Delgado-Buenrostro NL[2], Díaz-Urbina D[2], Rodríguez-Ibarra C[2], Déciga-Alcaraz A[2], González IM[2], Reyes JL[2], Hernández-Pando R[3], Pedraza-Chaverri J[1], Chirino YI[2]

[1] Departamento de Biología, Facultad de Química, UNAM. Departamento de Becas, DGAPA, UNAM. México.
[2] Unidad de Biomedicina, Facultad de Estudios Superiores Iztacala, UNAM. México.
[3] Unidad de Patología Experimental, Departamento de Patología, Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán. México.

Food-grade titanium dioxide (E171) is used as additive in food products for human consumption since 1960. Recently, it was demonstrated that intragastric E171 administration enhanced colon tumor formation in experimental models and induced histological alterations in testis. This rises further concerns of E171 as a possible trigger or synergistic diet component of pathologies. Regarding to diet, the increased fat intake jumped 22.8% from 1993 to 2013 worldwide and together with the E171 as a facilitator of colon tumor formation, brings the hypothesis of exacerbated toxicity induced by E171 after oral consumption in mice fed with a high fat diet (HFD). This work aimed to evaluate the toxicity in colon, liver and testis induced by oral administration of 5 mg/kg_{bw} E171 in mice fed with HFD for 16 weeks. Results demonstrated that mice fed with regular diet + E171 and mice fed with a HFD had higher number of adenomas, hypertrophy and hyperplasia of goblet cells and deregulation in mucin expression in colon. However, colon alterations were not exacerbated in mice fed with HFD + E171. HFD induced macrovesicular steatosis in the liver and mice fed with HFD + E171 had microvesicular steatosis which has a worse clinical prognosis. HFD mice and HFD + E171 mice had disruption of testis architecture and decrease in spermatozoa concentration and motility in the same extent. We conclude that E171 and HFD induced severe toxicity in colon and testis in the same extent but liver steatosis is exacerbated by combination of HFD + E171 administration.

Biography

Medina-Reyes EI completed her PhD at the age of 27 years at Universidad Nacional Autonoma de Mexico. Her research in the last 7 years is focused on explaining the mechanism of toxicity induced by engineered nanomaterials after inhalatory and oral exposure and currently, her work is supported by 13 articles published in recognized journals. She has participated in 5 international meetings about toxicology and part of her PhD thesis was performed in The National Institute for Public Health and the Environment, The Netherlands. In 2015, Society Of Toxicology in USA recognized her abstract awarding her with the Silver Level.

Presenting author details

Full name: Estefany Ingrid Medina Reyes
Contact number: +521 5531388284
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