



## Plastics and Our Lysosome: The Modulator of Hepatic Health

**Eshika Bindal, Kiran Gill, Parul Garg, Rajasri Bhattacharyya and Dibyajyoti Banerjee\***

*Experimental Medicine and Biotechnology Department, Postgraduate Institute of Medical Education and Research, India*

**\*Corresponding Author:** Dibyajyoti Banerjee, Experimental Medicine and Biotechnology Department, Postgraduate Institute of Medical Education and Research, India.

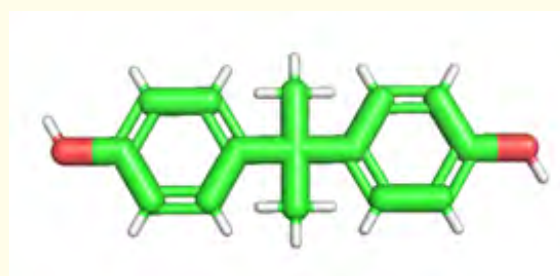
Alcohol has been known for a long to cause a spectrum of liver diseases [1]. Nevertheless, in the absence of alcoholism, a similar illness is reported. It is known as nonalcoholic fatty liver disease (NAFLD). NAFLD is increasing at a tremendous rate [2]. Scientists are showing that plastic leak outs can cause such disease [3]. It is seen that Bisphenol A and Bisphenol F (the two plastic leak outs) cause lysosomal dysfunction [4-6]. Lysosomal dysfunction can cause lipid accumulation in the cell as it regulates cellular lipid catabolism [7]. Therefore, Bisphenol A and Bisphenol F induced lysosomal dysfunction can result in lipid accumulation in the liver. So, Bisphenol A and Bisphenol F exposure can get lipid accumulation in the liver, which can cause NFALD. This can happen in the absence of alcoholism [4,5].

Bisphenol A and Bisphenol F are not the only plastic leak outs. Several other Bisphenols may leach out from plastics [8,9]. For example, we may say about Bisphenol B, Bisphenol C etc. These Bisphenols have structural similarities with Bisphenol A and F. But there are specific differences [10,11] (Figure 1). At the present moment, it is incompletely understood whether all types of Bisphenols cause lysosomal dysfunction and NFALD irrespective of its core structure or not. Considering the widespread emergence of NFALD and popular acceptance of plastic material, we believe the abovementioned question should be addressed urgently (Figure 2). Research in this direction will help us evolve safer plastics for better hepatic health. We must realize that COVID 19 pandemics have increased plastic pollution in this context. So, plastic related biological research has to be accentuated. Otherwise, there will be an upcoming wave of associated plastic disorders.

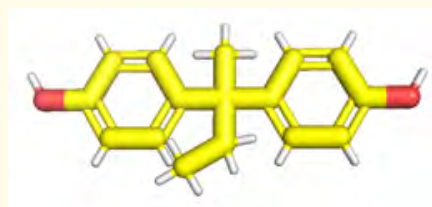
**Received:** February 23, 2022

**Published:** March 01, 2022

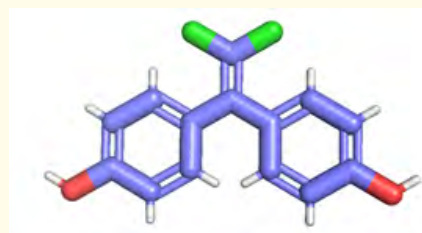
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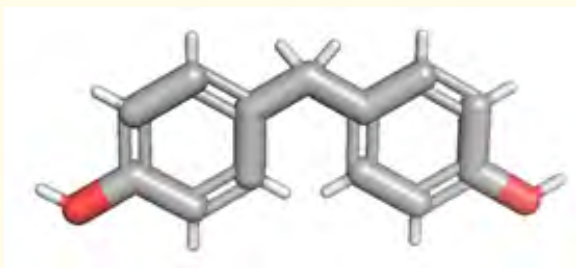
**Bisphenol A**



**Bisphenol B**

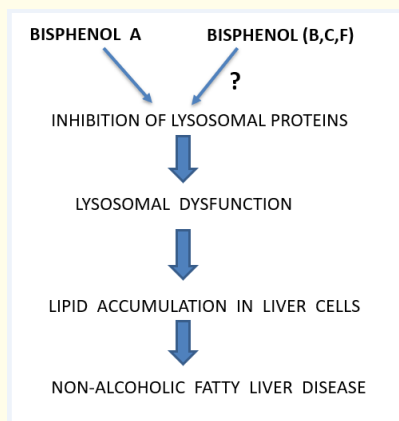


**Bisphenol C**



**Bisphenol F**

**Figure 1:** Structure of Bisphenol A, B, C and F.



**Figure 2:** Proposed mechanism of bisphenol induced causation NAFLD.

**Bibliography**

1. Osna NA., et al. "Alcoholic Liver Disease: Pathogenesis and Current Management". *Alcohol Research* 38 (2017): 147-161.
2. Younossi Z., et al. "Global Perspectives on Nonalcoholic Fatty Liver Disease and Nonalcoholic Steatohepatitis". *Hepatology* 69 (2019): 2672-2682.
3. Dallio M., et al. "Chemical Effect of Bisphenol A on Non-Alcoholic Fatty Liver Disease". *International Journal of Environmental Research and Public Health* 16 (2019): 3134.
4. Dallio M., et al. "Chemical Effect of Bisphenol A on Non-Alcoholic Fatty Liver Disease". *International Journal of Environmental Research and Public Health* 16 (2019): 3134.

5. Wang J., et al. "Bisphenol F induces nonalcoholic fatty liver disease-like changes: Involvement of lysosome disorder in lipid droplet deposition". *Environmental Pollution* 271 (2021): 116304.
6. Lv Q., et al. "Bisphenol A promotes hepatic lipid deposition involving Kupffer cells M1 polarization in male mice". *Journal of Endocrinology* 234 (2017): 143-154.
7. Larsen LE., et al. "Defective Lipid Droplet-Lysosome Interaction Causes Fatty Liver Disease as Evidenced by Human Mutations in TMEM199 and CCDC115". *Cellular and Molecular Gastroenterology and Hepatology* 13 (2022): 583-597.
8. Europe PMC n.d (2022).
9. Le HH., et al. "Bisphenol A is released from polycarbonate drinking bottles and mimics the neurotoxic actions of estrogen in developing cerebellar neurons". *Toxicology Letters* 176 (2008): 149-156.
10. Serra H., et al. "Evidence for Bisphenol B Endocrine Properties: Scientific and Regulatory Perspectives". *Environmental Health Perspectives* 127 (2019): 106001.
11. Padberg F., et al. "Minor structural modifications of bisphenol A strongly affect physiological responses of HepG2 cells". *Archives of Toxicology* 93 (2019): 1529-1541.

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