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RT-qPCR examination of the inflammation and immune system gene markers in the liver of Zebrafish after exposure to PFOA

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Summary:

Polyfluoroalkyl and perfluoroalkyl compounds (PFAS) are emerging environmental contaminants that have been detected in various environmental matrices, including air, water, and soil. These compounds are widely used in a range of industrial and consumer products due to their unique properties such as water and oil repellency, non-stick properties, and heat resistance. PFOA is a common PFAS compound that has been found to be the most persistent and prevalent in the environment and is known to bioaccumulate in the tissues of living organisms.

The toxicity of PFOA has been extensively studied, and it has been shown to have negative effects on various physiological processes in many species, including mice and zebrafish. The immune system is one of the most commonly affected systems by PFOA exposure, and it has been found to be associated with chronic inflammation and altered immune responses.

One of the most common methods used to assess the effects of PFOA exposure is to observe the morphology and behavior of the exposed organisms. In the case of zebrafish, exposure to PFOA has been shown to cause a gradual decrease in their movement, which can be observed over time. Additionally, some of the exposed zebrafish have been found to die, which suggests that PFOA exposure can be fatal.

After PFOA exposure, the mRNA levels of proinflammatory cytokines such as $\text{tnf}\alpha$, il8 , $\text{il1}\beta$, and il10 have been found to be increased, which suggests that PFOA may be involved in inflammation and tissue injury. However, more research is needed to determine the precise mechanisms underlying these effects, and to establish a causal relationship between PFOA exposure and inflammation.

In conclusion, PFOA is a highly persistent and prevalent environmental contaminant that has been shown to have toxic effects on many species, including zebrafish. It is important to continue studying the effects of PFOA exposure to better understand its impact on the environment and human health. Further research is needed to elucidate the molecular mechanisms underlying the observed effects of PFOA exposure on the immune system and to develop effective strategies for mitigating its adverse effects.