

Global Health Day

Understanding Cys34-Adducts' Stability by Utilizing Intraclass Correlation Coefficient

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Diverse pollutions in this mother earth can generate electrophiles which are inherently reactive. These reactive electrophiles can be a few of the major causes of acute and chronic adverse health outcomes. In this respect, discovering the characteristics of these electrophiles in vivo is important for understanding our global environment and human's health. Nevertheless, the lifespan of electrophiles are short in human's body, making it quite difficult to measure those directly. Once entering our bodies, toxic electrophiles react with Cys34 in blood, consequently forming Cys34-adducts. These Cys34-adducts slowly diminishes in our bodies. Therefore, the Cys34-adducts can become promising biomarker for diagnosing potential adverse health effects which can be mainly caused by exposures of diverse environmental contaminants (e.g., air pollutants).

Sampling for Cys34-adducts measurements, however, can be performed by only limited numbers due to clinical, logistical, and financial issues. In this sense, it is significant to understand the stability of Cys34-adducts' levels in repeat measurements depending on subjects and time-elapse. In order to understand the stability, we will obtain the intraclass correlation coefficient (ICC) values for Cys34-adducts. The stability of the unmodified T3 and multiple adducts will be tested from plasma in bloods samples taken from 7 subjects through approximately 1 year time elapsed. Our preliminary results show that unmodified T3, non-Cys34 methylation adducts, Cys34-adducts with directly oxidized products, and Cys34-aldehyde adduct (e.g., crotonaldehyde) have high ICC values. For these adducts, single-time point measurements might be robust and able to represent participants' long-term exposure of environmental contaminants. On the other hand, most of the cysteine-containing small thiol Cys34-adducts have low ICC values. Some of these adducts with low ICC have narrow range of adducts' level variation. Since average among subjects are similar, these adducts would role as good control samples. By studying further, we will expand the understanding about the stability of Cys34-adducts.

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