Acrylamide and Mercury: A Synergistic Threat to Neurological Health

INTRODUCTION

Acrylamide (ACR), an organic colorless chemical, has been widely used in the production of polystyrene, as a papermaking additive, for sewage treatment, and as a coagulating aid for drinking and waste water treatment. In addition, ACR forms in various foods during the thermal processing, which affects the central nervous system. MeHg is known to easily attach to sulfur atoms of thiol ligands and cross the blood brain barrier, which affects the central nervous system. MeHg is known to cause neurotoxicity, neurodegeneration, and encephalopathy [2]. ACR forms in various foods during thermal processing, which affects the central nervous system. MeHg is known to easily attach to sulfur atoms of thiol ligands and cross the blood brain barrier, which affects the central nervous system. MeHg is known to cause neurotoxicity, neurodegeneration, and encephalopathy [2].

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MECHANISMS OF ACTION

Acrylamide (ACR) is a water-soluble allelic agent used in the production of polystyrenes and polyacrylamides with various commercial applications. Polystyrene compounds are used in the textiles, cosmetic, and paper industries [9]. Polystyrene is used in ore processing and for flocculating for wastewater treatment. First, it was discovered that ACR was an electrophilic that preferentially forms adducts with sulfhydryl sites on specific protein targets. Next, it was noted that the protein catalytic subunits were related molecular targets of high, non-thiol-reactive catalytic subunits of the renin family. It was also noted that the catalytic subunits that formed adducts with specific protein targets for acrylamide, which is the top ten chemicals or groups of chemicals of major public health concern. Exposures to acrylamide or mercury post significant effects on human health. The health effect caused by acrylamide depends on the time, dose, and exposure period. Acrylamide is readily absorbed via the diet and can cause DNA, protein, and cellular oxidative stress and neurotoxicity. Other routes of exposure for both chemicals are possible in occupational environments or through inhalation and dermal contact. ACR is also prevalent in occupational and non-occupational settings. We have shown that type-2 amines like ACR reacting with specific cysteine residues on cellular proteins to impair protein function. Research shows that ACR reacts with Cys432 to inhibit the proapoptotic Bax protein. Oxidative stress forms in the brain that impairs the normal function of DNA that can affect the normal life cycle of neural cells. It is possible that since these compounds have similar mechanisms, they can also have an additive or synergistic effect.

RATES OF EXPOSURE

Acrylamide and Mercury are both known to cause neurotoxicity, neurodegeneration, and encephalopathy. Both chemicals are readily absorbed by the body, are capable of crossing the blood-brain barrier, bio-accumulate in the brain and disrupt neural pathways, and disrupt normal function of DNA that can affect the normal life cycle of neural cells. It is possible that since these compounds have similar mechanisms, they can also have an additive or synergistic effect.

EXPOSURE LIMITS

Acrylamide and Mercury are both known to cause neurotoxicity, neurodegeneration, and encephalopathy. Both chemicals are readily absorbed by the body, are capable of crossing the blood-brain barrier, bio-accumulate in the brain and disrupt neural pathways, and disrupt normal function of DNA that can affect the normal life cycle of neural cells. It is possible that since these compounds have similar mechanisms, they can also have an additive or synergistic effect.

REGULATORY STANDARDS

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CONCLUSION

Acrylamide and Mercury are both known to cause neurotoxicity, neurodegeneration, and encephalopathy. Both chemicals are readily absorbed by the body, are capable of crossing the blood-brain barrier, bio-accumulate in the brain and disrupt neural pathways, and disrupt normal function of DNA that can affect the normal life cycle of neural cells. It is possible that since these compounds have similar mechanisms, they can also have an additive or synergistic effect. It has been shown that two-alleles like ACR reacting with specific cysteine residues on cellular proteins to impair protein function. Research shows that ACR reacts with Cys432 to inhibit the proapoptotic Bax protein. Oxidative stress forms in the brain that impairs the normal function of DNA that can affect the normal life cycle of neural cells. It is possible that since these compounds have similar mechanisms, they can also have an additive or synergistic effect. It has been shown that two-alleles like ACR reacting with specific cysteine residues on cellular proteins to impair protein function. Research shows that ACR reacts with Cys432 to inhibit the proapoptotic Bax protein. Oxidative stress forms in the brain that impairs the normal function of DNA that can affect the normal life cycle of neural cells. It is possible that since these compounds have similar mechanisms, they can also have an additive or synergistic effect.

REFERENCES

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