

# Did you know



- Children are more exposed to BFRs, because they ingest big amounts of contaminated dust while playing on the ground and taking objects to their mouths!

- By reducing the flammability of materials during fires, BFRs promote the formation of carbon monoxide, which increases the risk of poisoning during a fire.



Crédit : Cinbiose - UQAM



## What's new?



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Since my childhood, I have always wanted to share knowledge and make it accessible for everyone. That is what led me to initiate this great adventure of creating a science journal. I hope that by reading my text this same feeling will encourage you, and who knows? You could become the next author, or student in our Institute!



## Glossary

**Brominated Flame Retardants** : substances that make materials less flammable

**Endocrine disruptors** : chemical molecules that can mimic or block the action of hormones in the body

**Carcinogenesis** : set of phenomena transforming a normal cell into a cancer cell.

## Cinbiose

CINBIOSE (Centre de recherche interdisciplinaire sur le bien-être, la santé, la société et l'environnement) works on the impacts of environment on health. This has become an unifying element for its local and international employees.

Coming from Canada, Latin America and Europe, members and students contribute to the dynamism of Cinbiose through the various activities they offer. Stay informed about Cinbiose activities by visiting their website ([cinbiose.uqam.ca](http://cinbiose.uqam.ca))

## REFERENCES

- (1) Birnbaum and Staska 2004 - DOI10.1289/ehp.6559
- (2) Briskin 2008 - DOI10.2533/chimia.2008.406
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## Brominated flame retardants : heroes or enemies?

RITA GOUESSE - PHD STUDENT

Are you seated on a sofa while reading this article? Chances are that it contains substances to protect you in case of fire, but these compounds can also play an important role in the process leading to breast cancer in women.



What if this kid  
was in danger?

ON MOBILE PHONES, HOUSEHOLD FURNITURE AND EVEN CHILDREN'S TOYS, BROMINATED FLAME RETARDANTS (BFRS) ARE EVERYWHERE.

THEIR ROLES? TO REDUCE IGNITION RATE AND COMBUSTION OF OBJECTS IN CASE OF FIRE. HOWEVER, IN RECENT YEARS, SCIENTIFIC VOICES HAVE ARISEN HIGHLIGHTING THE TOXIC EFFECTS OF BFRS ON HORMONAL BALANCE AND HUMAN HEALTH.

After some time and attrition, BFRs' molecules leach out from objects to which they were added. They can easily accumulate in dust, leading to human exposure by breathing, ingestion or dermal absorption. This daily exposure has raised concerns about the safety of BFRs. As studies are being conducted, these super molecules, true heroes in the industries, are being more and more criticized by the scientific community. Their endocrine-disrupting properties are indeed harmful to human health.(1)

## Endocrine disruptors... **the dark side of the BFRs**

Most of BFRs are able to trick our endocrine system by mimicking or blocking the action of hormones, both in men and women. That is the reason why they are called endocrine disruptors.

Because of these dangerous properties, BFRs can disturb the hormonal balance and cause several diseases such as thyroid disorders, birth defects and cancers (2).

## When these **super-heroes** turn out to be our **worst enemies**

Men, women or children, BFR contamination spares no one! We can find them in human blood, adipose tissue, breast milk, placenta and even in the umbilical cord, which could result in fetal contamination. Studies have shown that exposure to BFRs leads to a decrease in male and female fertility, as well as a dysregulation of thyroid hormones and estrogens' signaling.

BFRs alter mammary gland development and stimulate breast cancer cells multiplication in vitro (3,4,5). This hidden side of BFRs could play a key role in breast carcinogenesis.

Breast cancer is the second cause of death associated with cancer among women in Canada, exposure to certain endocrine disruptors is known to increase its incidence. The concerns raised by the studies about the BFRs and their omnipresence in our environment, are part of the reasons why I decided to study their effects on mammary gland development and breast cancer.

**Men, women or children, BFR contamination spares no one!**



**My project**  
in a nutshell

I have been trying to understand the effects of BFRs' exposure on mammary glands of rats exposed during their pregnancy and breastfeeding.

I will also analyse the effects of BFRs exposure on mammary glands from pups exposed perinatally and through breastfeeding.

By studying breast development, milk production capacity, hormonal balance and cell-cell interactions in the mammary gland, I will be able to determine where, when and how BFRs can have harmful effects on mammary gland development and function.

Knowing that certain BFRs are still used despite their "dark side", my results will help to determine the consequences and risks that this exposure causes. This would also help to elaborate plans for preventing and reducing BFRs' environmental contamination.