

# NIH News in Health

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**Inside News:** 3 Breastfeeding 4 Antibiotic-Resistant Bacteria 4 Kratom 4 Talking With Your Health Care Provider

## Probing Personal Care Products Look Out for Harmful Ingredients

Shampoo. Shaving cream. Deodorant. Makeup. Hair dye. Perfume and cologne. These and dozens of other products may be in your shower, gym bag, or medicine cabinet. But do you know what's in them? Could any of their ingredients be risky for your health?

Personal care products, including cosmetics, are regulated by the U.S. Food and Drug Administration (FDA). But they're not treated like drugs. They don't have to be approved by the FDA before they go on the market. So companies don't have to prove that

personal care products are safe or effective before selling them, says Dr. Alexandra White, who studies chemicals and health at NIH.

The exceptions are personal care products that treat or prevent health conditions. These must be FDA-approved before they go on the market. Examples include sunscreen and anti-dandruff shampoo.

But overall, "cosmetics are one of the least regulated sets of consumer products out there," says Dr. Ami Zota, an environmental health researcher at Columbia University. The FDA monitors products for



potential safety issues once they're on the market. It takes action when needed to protect public health.

Researchers are working to better understand the health effects of common ingredients in personal care products. They're also developing better and faster ways to test such ingredients for safety.

**What's in That Bottle?** • Most ingredients in personal care products are in a category known as "generally recognized as safe," or GRAS, explains Dr. Nicole Kleinstreuer, a computational toxicologist at NIH.

But certain chemicals that may cause health problems can be found in many of these products. How much you're exposed to is often what makes a chemical harmful. The amount that's "safe" varies for each.

"The general classes we're concerned about include phthalates, parabens, PFAS, and metals like

lead," says White.

Other problem chemicals include triclosan and triclocarban. These are included in many personal care products to prevent bacterial and fungal growth.

Many chemicals of concern, including phthalates, parabens, PFAS, and triclosan, are endocrine disruptors. These are compounds that can mimic or interfere with the body's **hormones**. They've been linked to problems with the brain, development, and reproduction. Some have also been linked to a higher risk of certain cancer types.

Metals like lead and mercury can also be toxic. They can cause damage to the brain. Another ingredient to look out for is formaldehyde. It is found in some hair products or created when hair products are heated. Formaldehyde exposure has been linked with cancer.

Talc is also a common ingredient in cosmetics. "Talc is used in a lot of powders, including face powders," Zota says. It's generally recognized as safe by the FDA. But talc can sometimes be contaminated with asbestos, which is linked to cancer.

*continued on page 2*



### Definitions

#### Hormones

Substances sent through the bloodstream to signal another part of the body to grow or react a certain way.

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**continued from page 1**

The FDA has been testing for asbestos recently in many talc-containing products (see [go.usa.gov/xJeeB](https://www.fda.gov/xJeeB)).

It can be hard to figure out if a product contains potentially risky ingredients. You can avoid some of these chemicals by looking for them on the product label. But they can have many names and abbreviations. Sometimes the names of specific chemicals don't appear on the label at all, but they're still in the product.

"Fragrance is one example," says Zota. "Something listed as 'fragrance' can be a mixture of thousands of chemicals." Looking for fragrance-free products can help lower your exposure to many unknown ingredients.

**Which Chemicals Are Risky?** • Most personal care products are mixtures of many different chemi-

## Definitions

### Inflammation

Heat, swelling, and redness caused by the body's protective response to injury or infection.

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icals. This can make it hard to link specific products to health problems. But researchers have found some worrying trends.

"We've seen [a link] between frequent hair straightener use and cancer risk," says White. So far, this has included breast cancer and ovarian cancer. Her team has also found a link between the use of permanent hair dye and breast cancer. The risk was especially high for Black women.

To help make safer products, better tests are needed to understand how chemicals affect the body over the long term. Kleinstreuer is working on a team that's developing new methods to test chemicals in human cells instead of animals. The tests are like taking a chemical fingerprint, she explains.

First, the team measures changes that happen in cells after they are exposed to chemicals with known effects. Then, they test a new chemical. If it produces changes similar to a known one, scientists can assume it affects the body in a similar way.

"For example, we know excess **inflammation** is bad. And we can [measure] cell markers of inflammation. If a chemical causes [those markers] to increase, we know that's a bad thing," Kleinstreuer says. Inflammation that lingers over time can cause health problems. Her team hopes to eventually use these types of tests to predict which chemicals may be harmful for long-term exposure.

Her team is also using engineered skin tissue to develop better tests for allergy and irritation. These models are being widely used to predict short-term side effects from chemical exposures, including those in cosmetics.

**Buyer Be Aware** • Trying to keep potentially risky chemicals out of your daily life can help you and your family stay healthier. But there are

times that you may want to be even more cautious. People can be more vulnerable to chemical exposures during certain times in their lives.

One of these is pregnancy, says White. "It's a time when the breast tissue is going through rapid changes and might be more susceptible to cancer-causing chemicals."

"Even small levels of some of these chemicals can impact fetal development and growth," Zota says. Early childhood and puberty are other times when people may be more susceptible to endocrine disruptors, she adds.

If you have questions about any personal care products, talk with your health care provider. ■



## Wise Choices

### Personal Care Product Precautions

- Follow the directions in personal care product packages. Pay attention to all caution and warning statements.
- If any cosmetic or personal care product causes irritation, stop using it immediately. If the irritation persists, see a doctor.
- Don't share your cosmetics. This can transfer harmful germs.
- Don't use old cosmetics.
- Don't use any cosmetics near your eyes unless they're intended specifically for that use. Avoid color additives for use near the eye that are not FDA-approved.
- Never dye your eyebrows or eyelashes. This can hurt your eyes or even cause blindness.
- Keep hair dyes out of the reach of children.
- Never mix different hair dye products.

*Adapted from the U.S. Food and Drug Administration*



## Web Links

For more about personal care products and health, see "Links" in the online article: [newsinhealth.nih.gov/2022/08/probing-personal-care-products](https://newsinhealth.nih.gov/2022/08/probing-personal-care-products)

# The Biology of Breast Milk

## Getting a Good Start on Nutrition

You may have heard that breast milk is best. But what makes it so good for babies? Breast milk fills your baby's health needs. Researchers are now learning more about what's in it and how it changes as babies grow.

"Breastfeeding is the gold standard for feeding infants," says Dr. Dan Raiten, an NIH expert on childhood nutrition. Human milk provides nutrients and other compounds that babies need to grow and develop. These include proteins, fats, carbohydrates, vitamins, and minerals.

Experts recommend that infants drink human milk exclusively for the first six months of life. If possible, they should continue drinking human milk, from the breast or that's

been pumped and placed in a bottle, for up to 12 months. Parents can add in other foods starting around six months.

Breastfeeding (sometimes called chestfeeding) lowers an infant's risk for developing asthma, obesity, type 1 diabetes, ear infections, gut infections that cause diarrhea or vomiting, and sudden infant death syndrome (SIDS). It also benefits the mother, potentially lowering her risk of high blood pressure, type 2 diabetes, ovarian cancer, and breast cancer. It helps the parent-infant bonding process, too.

Human milk also provides infants with protection from germs. A baby's **immune system** is not yet developed. So they don't have many germ-fighting molecules, called antibodies. Breast milk passes the mother's antibodies to the baby. This helps protect the child from germs until their immune system develops.

Breast milk contains many other biologically active components, too. "Human milk is not just a composite of individual components," Raiten says. "It's an active biological system." The lactating (milk-producing) parent and infant interact and affect one another. That means what's in human milk can change, even over the course of the day.

Take the molecules that regulate your body's biological clocks, or circadian clocks. Your body has different amounts of these depending on the time of day. They signal when it's time to wake, eat, and sleep. These are passed along to the baby through breast milk.

Researchers are just beginning to understand how milk composition affects babies' short-term and long-term health. To learn more, NIH started the BEGIN project.



This project is trying to untangle the biology behind milk production, how milk affects babies' development, and how babies and their environment influence this system.

Some lactating parents don't produce enough milk or may have physical issues that block milk from coming out. Others may be advised against breastfeeding if they're taking certain medications or drugs or when they have certain illnesses.

For those who can't breastfeed, formula is an option. "Formula is based on our best knowledge about the composition of human milk," Raiten says. And that knowledge continues to evolve.

"If you can do it, breastfeeding is the best way to take care of your baby," says Raiten. If you're having trouble, talk with your health care provider. ■



### Wise Choices

#### Getting Started Breastfeeding

- Cuddle with your baby skin-to-skin right after giving birth if you are both healthy.
- Breastfeed as soon as possible after giving birth.
- Ask for a lactation consultant at the hospital to help you.
- Ask hospital staff not to give your baby pacifiers, sugar water, or formula, unless medically necessary.
- Let your baby stay in your hospital room all day and night so that you can breastfeed often.
- Try not to give your baby any pacifiers or artificial nipples until they're good at latching on to the breast (usually 3 to 4 weeks old).
- Learn your baby's hunger signs. They may become more alert and active. They may put their hands or fists to their mouth, make sucking motions, look around for the breast, or cry.



### Definitions

#### Immune System

The system that protects your body from invading viruses, bacteria, and other microscopic threats.



### Web Links

For more about breastfeeding, see "Links" in the online article: [newsinhealth.nih.gov/2022/08/biology-breast-milk](https://newsinhealth.nih.gov/2022/08/biology-breast-milk)





## Health Capsules

For links to more information, please visit our website and see these stories online.

### Fighting Bacteria With Viruses

Bacteria that can't be killed with antibiotics are a growing problem around the world. These cause serious infections in hospitals and other health care settings.

Scientists have been looking for new ways to kill drug-resistant bacteria. One idea has been to use bacteriophages, also called phages. Phages are viruses that infect bacteria but are harmless to people.

In a new study, researchers treated a man with a life-threatening lung infection with phages. The team found two phages that could kill the bac-

teria he was infected with. The man then received treatment with these phages for over a year. His infection eventually disappeared, and he was able to have a lung transplant.

Doctors from around the world sent 200 bacterial strains from patients with drug-resistant infections to the researchers for phage testing. The scientists first tested which phages could kill the bacteria. Then, they treated 19 other patients with the phages.

In total, eleven of the patients' infections improved or went away.

Four patients saw no benefit. The results from the other five weren't clear.

These results show the promise of using phages to kill bacteria. But more work is needed to make the treatment effective in more people.

"We've not yet figured out how to find or engineer phages that will get every strain of bacteria in these patients," says Dr. Graham Hatfull from the University of Pittsburgh, who helped lead the studies. "That represents one of the major challenges ahead." ■

### Is Kratom Safe?

Kratom is a tree in the coffee family. It's found in Thailand and neighboring countries. For centuries, people in Southeast Asia have used its leaves for both increased energy and relaxation. More recently, people around the world are using it to treat pain or manage opioid withdrawal symptoms. But kratom's safety and effectiveness haven't been well studied.

In the U.S., kratom products are sold in stores—like herbal or smoke shops—and online. But there are no FDA-approved uses for kratom. Many

products sold as kratom have been found to contain harmful contaminants, like heavy metals and bacteria.

Kratom has been reported to have varied effects. Stimulant-like effects include increased energy, alertness, and rapid heart rate. Opioid-like effects include relaxation, pain relief, and confusion. Researchers are studying what kratom does in the brain, what interactions it has with medications, and whether it's helpful for medicinal uses. But studies are in the early stages.

Some people report using kratom to help manage opioid withdrawals and cravings. But people who use kratom regularly may experience withdrawal symptoms if they stop using it or cut back. More research is needed to find out why.

Kratom may have some mild side effects, like nausea, constipation, or dizziness. It's also been associated with rare serious effects, such as seizures, high blood pressure, and liver problems. To learn more, visit [go.usa.gov/xSrWg](https://go.usa.gov/xSrWg) or [go.usa.gov/xSrWj](https://go.usa.gov/xSrWj). ■



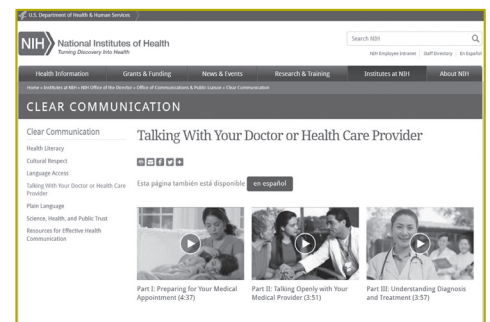
### Featured Website

Talking With Your Doctor or Health Care Provider

[go.usa.gov/xScxA](https://go.usa.gov/xScxA)

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