

LAY ABSTRACT

TITLE: Operationalizing the Exposome Using Passive Silicone Samplers

JOURNAL: Current Pollution Reports. 2022: 8(1):1-29

AUTHORS: Zoe Coates Fuentes¹, Yuri Levin Schwartz¹, Anna R Robuck¹, Douglas I Walker¹, #

Corresponding author

INSTITUTIONS:

1. Department of Environmental Medicine and Public Health, Icahn School of Medicine at Mount Sinai, 1428 Madison Ave, New York, NY USA.

Now at Gangarosa Department of Environmental Health, Rollins School of Public Health, Emory University, Atlanta, GA USA

This is attributed to the CEECR grant: UG3CA265846.

LAY ABSTRACT

Throughout your lifetime, your body interacts with the environment around you. Some things in our environment, such as the food you eat or the air you breath, are required for your body to be healthy. Other things, like pollution or chemicals, also interact with your body and may change your risk of developing certain diseases. Currently, scientists are focused on trying to understand how all the exposures we experience, referred to as the exposome, may affect our health. The hope is once these exposures are identified, we can reduce the levels of these exposures and improve public health.

Because everyone is different and may experience different exposures, it can be hard for scientists to identify all exposures that someone encounters. Exposures may not last long in or out of the body, and they can vary by time and location. The samples we collect can also make understanding exposures difficult, since levels in one sample type (such as blood) may not be the best for studying current exposures. One solution to help with this problem is to use silicone passive sampling devices (PSDs), which are low-cost and can be worn as a pin or wristband. As someone goes about their day, these PSDs can absorb exposures that their body may come in contact with. After wearing the PSD for some amount of time, scientists can measure what chemicals were absorbed in the PSD to understand what exposures that person experienced during that time. Then, scientists can study all of these chemicals and other information gathered about this person to form conclusions about how that person's exposome may impact their health.

This paper will discuss how to use PSDs to study exposures, including how these wristbands can be prepared, what exposures can be measured, and what is the best way to use them in studies of public health. This paper also discusses how PSDs are useful to provide information on someone's specific exposome. The use of PSDs to study the exposome continues to improve and is helping scientists better understand how exposures impact disease risk to ultimately identify ways to reduce these exposures and improve population health.