



Montgomery and Bucks County, PA



The PA Multi-site Health Study

Information Session

March 25, 2021

RTI International, PA Department of Health, Temple University, Brown University

INFORMATION TO PROTECT OUR COMMUNITIES



National Center
for Environmental Health
Agency for Toxic Substances
and Disease Registry



PFAS Exposure and COVID-19

Presenter:

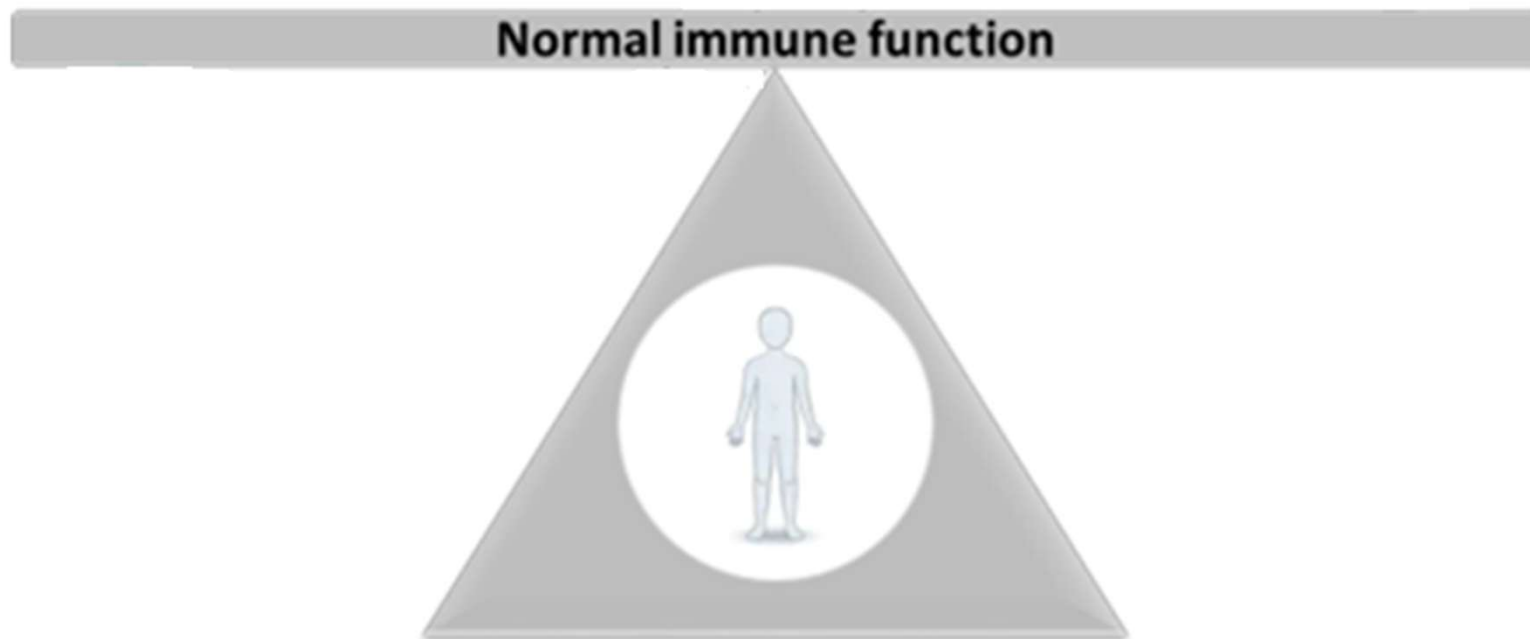
Dr. Jamie DeWitt, East Carolina University



What is the job of the immune system?



- Maintains normal body functions
- Protects from pathogens (i.e., bacteria, viruses)
- Monitors for tumors
- Responds to injuries
- Identifies ***non-self*** material
- Performs redundant functions for high performance





What happens after a vaccination, for example?



Innate

Adaptive (cellular)

Adaptive (humoral)

“Challenge” (a vaccination or, for example exposure to the flu)

Strength of response

Interferons
Cytokines

Neutrophils

Macrophages

NK Cells

Cytotoxic T
lymphocytes

Antibodies

These are
the proteins
that provide
long-lasting
protection!

Time

Image information from: Burleson, 2015



What is immunotoxicity?



Immune suppression:

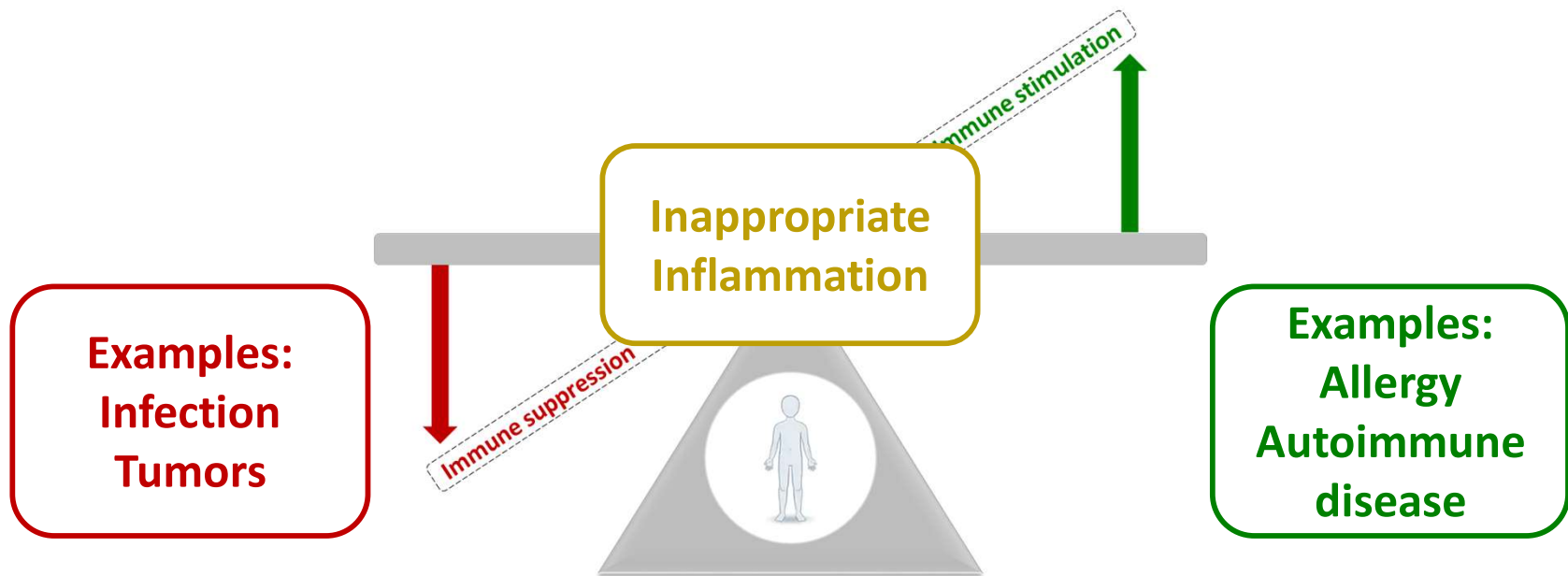
A reduced ability of the immune system to respond to a challenge from a level considered normal.

The immune system doesn't respond strongly enough.

Immune stimulation:

Inappropriate immune responses to common substances.

The immune system responds too strongly to things that it shouldn't respond to or to its own body.





What do PFAS do to the immune system?

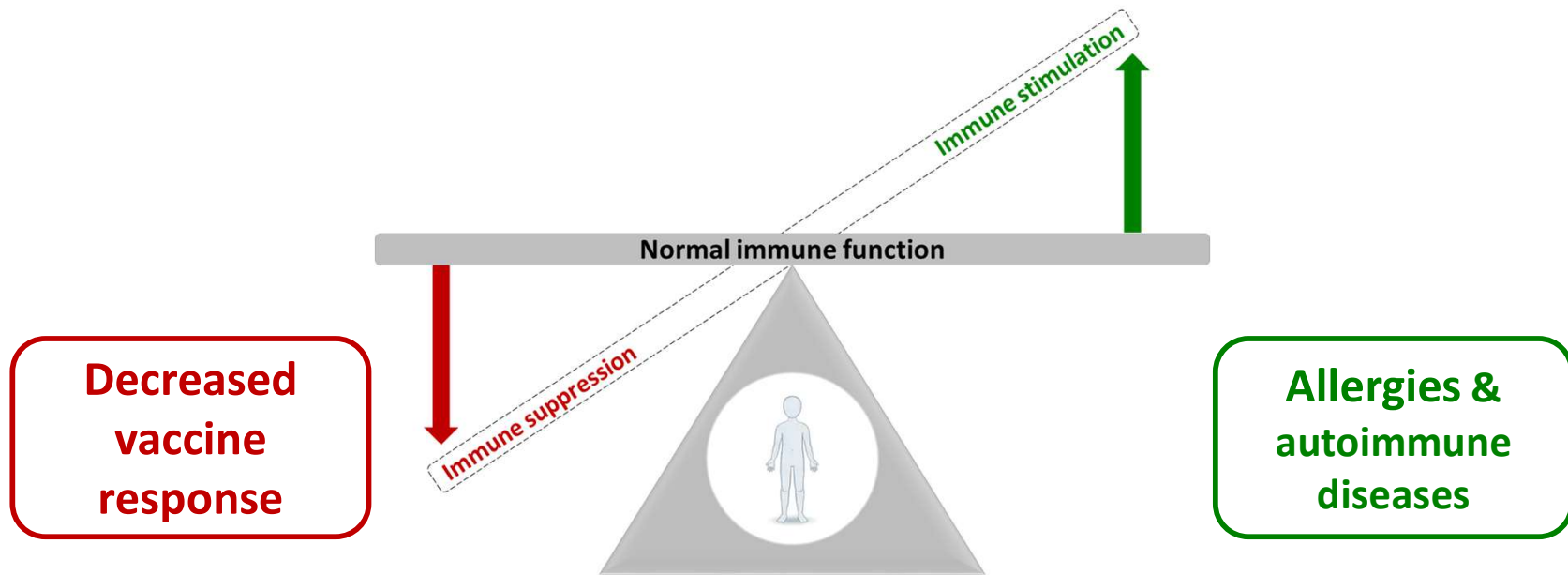


Immune suppression:

- PFOA and PFOS – strong evidence from studies of people and experimental animals.
- PFHxS, PFDA, PFNA, PFUA, PFDoA – some evidence from studies of people.

Immune stimulation:

- PFOA – some evidence from studies of people and experimental animals.
- PFOS, PFHxS, PFNA, PFDA, PFBuS, PFDoA – some evidence from studies of people.





An example of immune suppression



Innate

Adaptive (cellular)

Adaptive (humoral)

“Challenge” (a vaccination or, for example exposure to the flu)

Strength of response

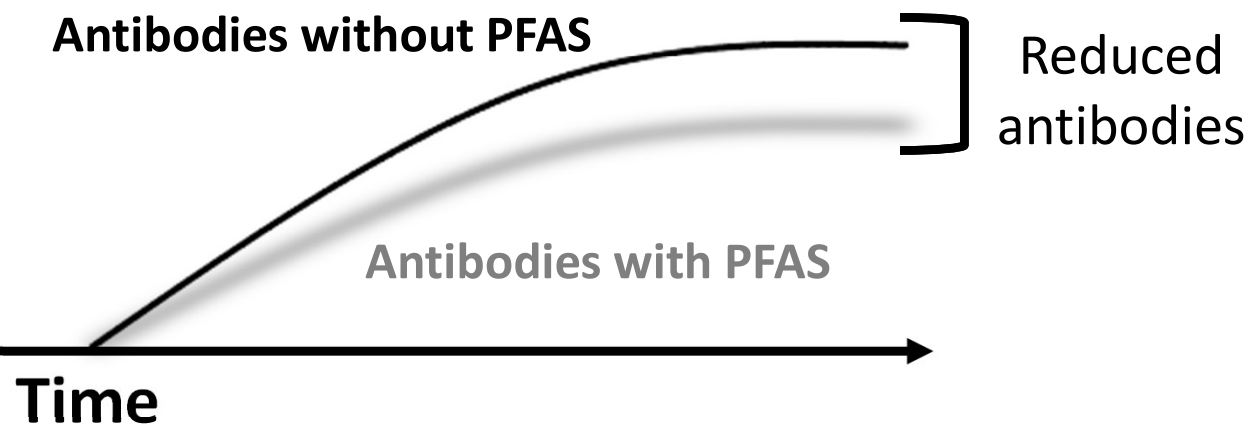


Image information from: Burleson, 2015



An example of immune suppression from PFAS

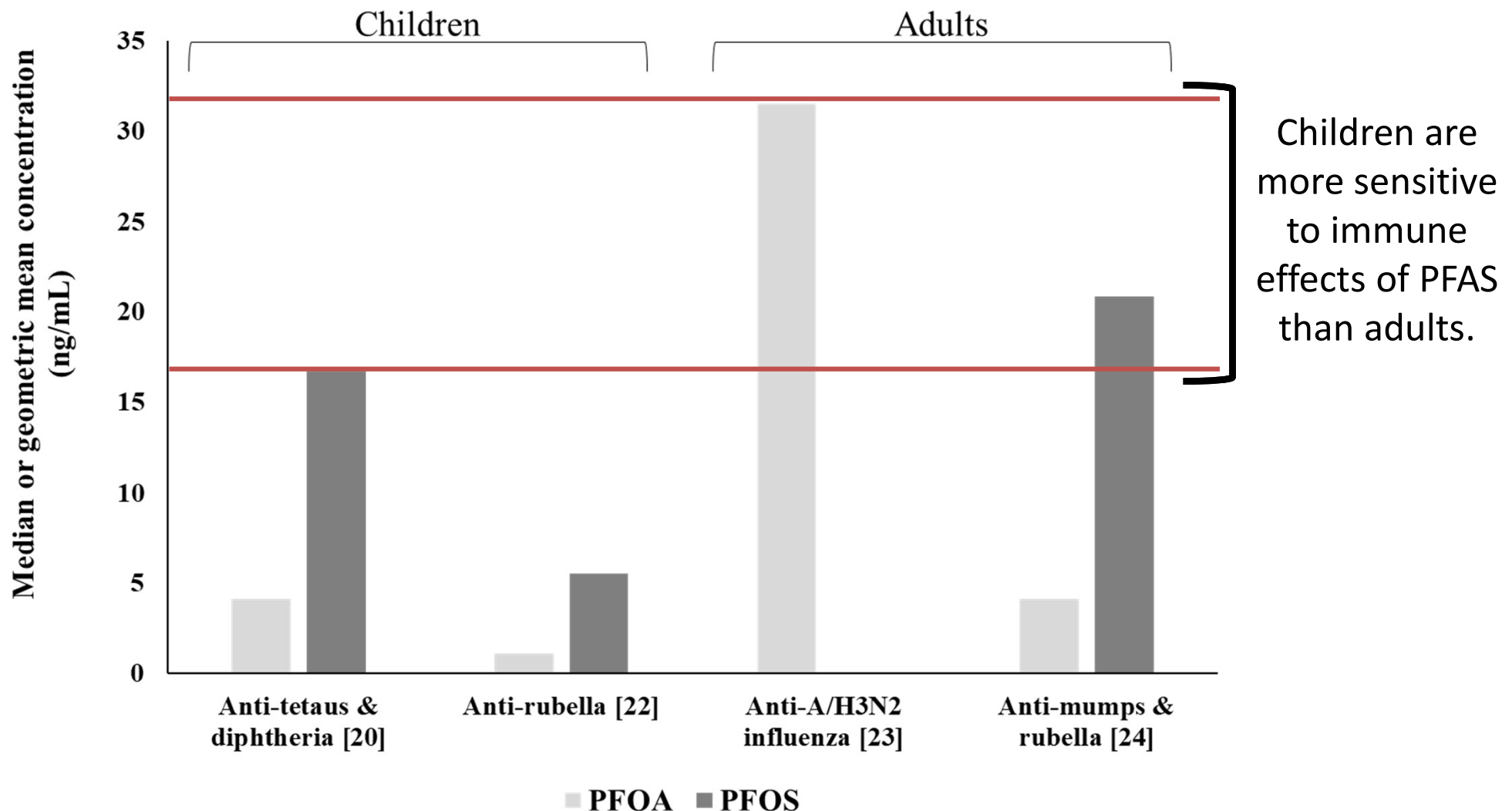


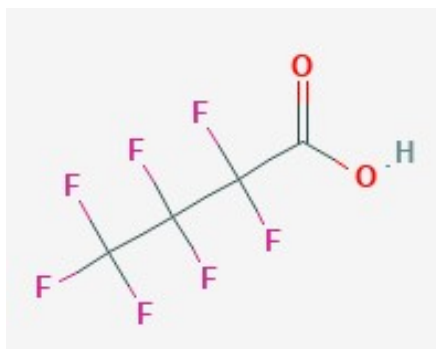
Image from: DeWitt et al., 2019



What about PFAS and COVID?



Patients with higher PFBA concentrations in their blood had COVID infections that required longer hospital stays or worse infections.



This is PFBA

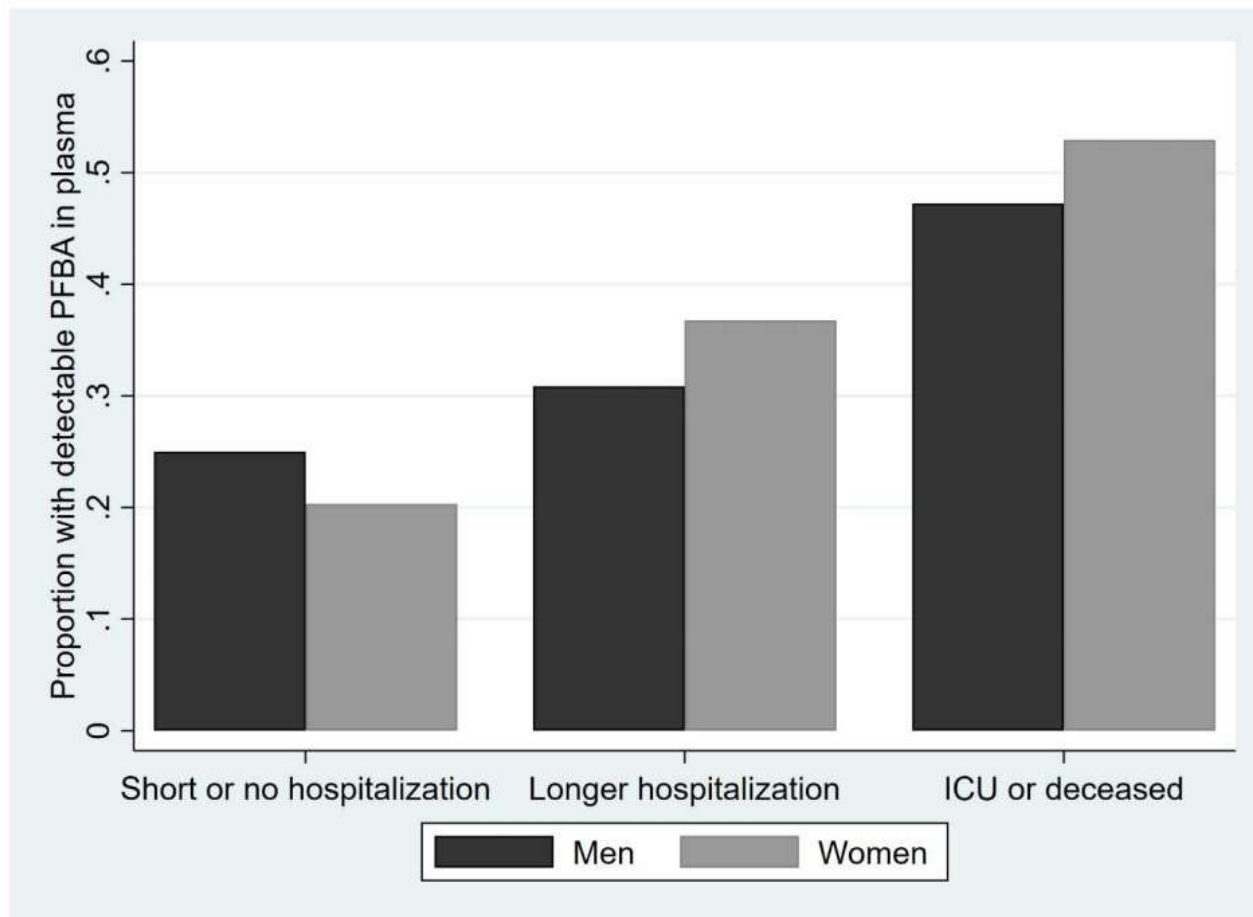


Image from : PubChem; Data from: Grandjean et al., medRxiv preprint
doi: <https://doi.org/10.1101/2020.10.22.20217562>.



The take-home message (for now).



What we know

PFOA and PFOS as well as other PFAS suppress vaccine responses. Suppression of the adaptive immune system can increase the RISK of a poor vaccine response.

What we're worried about

PFOA, PFOS, and other PFAS may suppress vaccine responses.

Bottom line:

There is a risk, but it has not yet been evaluated.
Get vaccinated if you can; even a poor response still gives the immune system an extra boost.