

**Research Translation Plan for
University of Washington Superfund Research Program**

Project 3: Role of Paraoxonases (PONs) in Modulating Cadmium and Manganese Neurotoxicity

PIs: Clement Furlong, Lucio Costa, Judit Marsillach
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Research translation goals:

- Provide clinical labs with information that might help develop a screening tool for early detection of neurodegenerative disorders like Parkinson's disease (PD).
- Improve care for patients who suffer from PD and related diseases.
- Track the efficacy of medications and other medical interventions.

Intended audience:

- Clinical researchers.
- Medical practitioners.
- People at higher risk of PD because of their genes for PON2.
- Regulatory agencies (e.g. CDC, EPA, ATSDR) and the populations they serve.
- Other SRPs.

What might interest the intended audience about this research:

- Paraoxonase, PON 1,2,3, HDL and mitochondria modulate oxidative stress.
- Parkinson's is related to malfunctioning mitochondria.
- Exposure to pesticides is riskier for some people than for others.

Three main points:

1. Due to their genetics, people have different levels of expression of the PON genes—this leads to different levels of protective compounds in the body that break down toxins and regulate oxidative stress.
2. While companies are required to test the toxicity of parent compounds when evaluating the potential health effects of a potential pesticide, the reality is that some of these parent compounds react in the environment to produce new, much more toxic compounds in the fields where they are ultimately applied.
3. Babies have low levels of the compounds that protect them.

Opportunities to engage:

- Develop a screening test to look for people at higher risk of developing PD.
- Develop a methodology to test the efficacy of different medical interventions.
- Technology transfer of new protocol for mass spectrometric determination of PON1 oxidative stress adducts and a PON2 status assay.

Next steps:

- Work with new collaborator to redo the experiment with a new set of blood samples.

Impacts on audience:

- Motivate health care practitioners to develop a screening test.
- Improving the ability of patients to modulate their own oxidative stress.

Impacts on myself and other scientists:

- To get it published.
- Provide a new tool for other scientists.

Gathering feedback:

- Through the media after publication.
- Feedback from seminars.

Responding to feedback:

- Iterate and play it by ear to improve approach.