Abstract/Poster: 404

Respiratory and Immunology Project at Larkin Research Team
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Dose-Response of the Pro-Inflammatory Potential Induced by Indoor Settled Dust from Homes with Different Levels of Water-Damage during Hurricane Maria in San Juan, Puerto Rico

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Introduction

Hurricane Maria (September 2017), caused extensive indoor wind- and water-damage to homes throughout Puerto Rico. This environmental hazard increases the risk for household occupants to chronic exposures to indoor pollution, which can result in chronic immune reactivity. Preliminary studies found that indoor dust from fully flooded homes induced less pro-inflammatory potential than non-flooded water damage homes (Rivera-Mariani et al. 2019, SOT, *DOI: 10.7490/f1000research.1116637.1*). We hypothesize that indoor dust from fully flooded homes possess immunosuppressive potential.

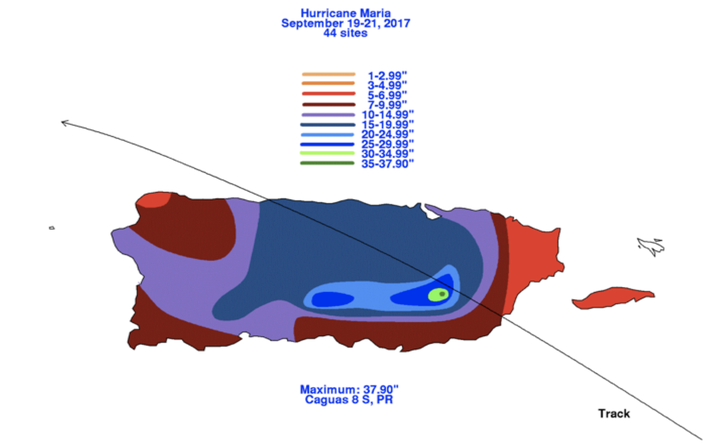

Figure 1. Map of total rainfall in Puerto Rico during the Hurricane Maria. NOAA Tropical Cyclone Report: Hurricane Maria (Accessed Feb, 2019).

Methods

Figure 2. Site of study (Figueroa Community) in San Juan, PR. Image retrieved with the *ggmap* R package.

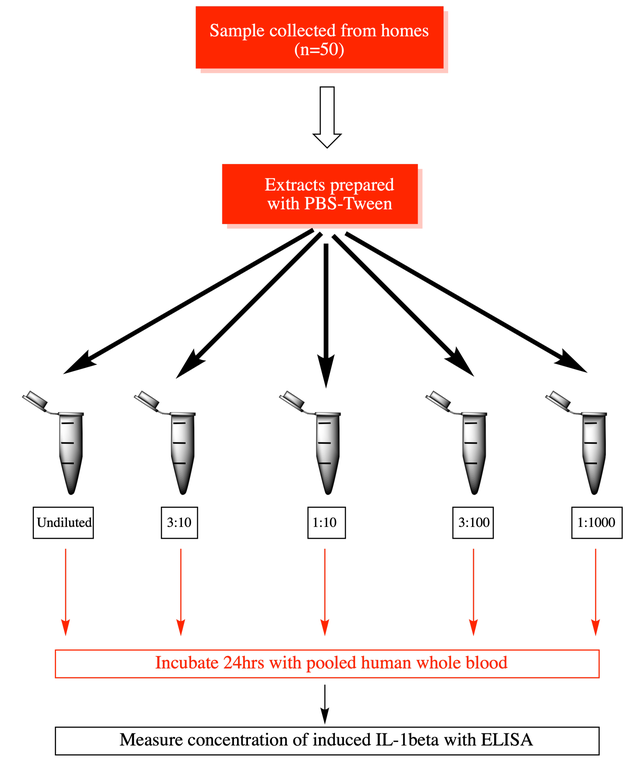

Figure 3. Human whole blood incubation with undiluted and diluted (3:10 to 1:1000) soluble extracts from indoor composite settled dust samples.

Results

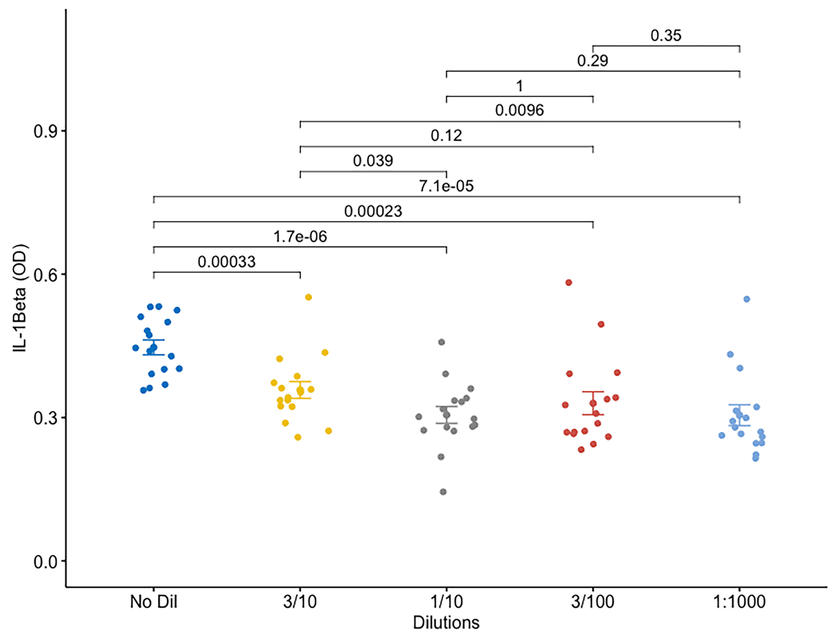

Figure 4. After incubating human whole blood with the dust, at different dilutions, the undiluted samples yielded the highest IL-1beta potential. Nevertheless, after 1:10 dilution, the induced IL-beta in comparable levels. Pairwise comparison was performed with Wilcoxon signed-rank test.

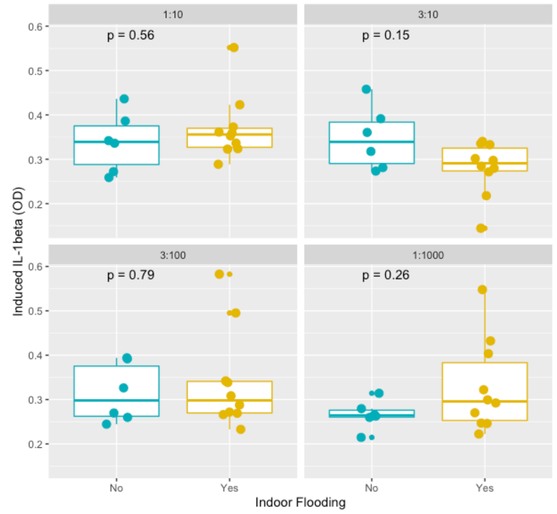

Figure 4. Settled dust soluble extracts from flooded homes induced comparable or higher pro-inflammatory potential, but not statistically significant, when diluted 3:10, 3:100, and 1:1000 dilutions. Paired comparison was performed with Wilcoxon signed-rank test.

Conclusion

- Although not statistically significant, possibly due to sample size, our findings suggests that settled dust extracts from flooded regain pro-inflammatory potential when diluted. This suggest the existence of immunoinhibitory potential in less diluted extracts.

Future Studies

Future studies will,

- evaluate induced epigenetic changes by undiluted and diluted settled dust soluble extracts
- identify immunoinhibitory components of biological and non-biological origins.

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Conflict of Interest

- The authors have no conflict of interest to disclose.