

**2018 ACMT Annual Scientific Meeting  
FIT MedTox Shark Tank Research Forum**

**Presentation 5**

**Title:** Can Cadmium Exposure Cause Anemia? Examining Cadmium in Blood and Urine and Urine Beta 2 Microglobulin with Hemoglobin Level

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**Background:** Cadmium exposure is well known to cause damages in various organs such as lung, bone, and kidney. Because cadmium exposure can cause bone and kidney pathologies, we may assume that cadmium can also cause hematological problems such as anemia due to decreased erythropoietin production and bone marrow dysfunctions. However, there has not been any study done to examine the association between cadmium exposure and anemia, to my knowledge. Therefore, this study examines the levels of blood cadmium, urine cadmium and UB2M in relation to hemoglobin to study if cadmium exposure can cause anemia.

**Aim:** The aim of this study is to examine the hypothesis- there is an association between levels of blood cadmium, urine cadmium and/or urine beta 2 microglobulin (UB2M) and hemoglobin level, which might indicate that cadmium exposure can cause anemia

**Methods:** The data employed for this study comes from approximately 100 samples of occupational data, collected as a part of OSHA required biological surveillance program in the past 14 years in a company in East Coast. The data analysis consists of the following steps. First, blood cadmium, urine cadmium and UB2M are categorized into three groups according to OSHA biologic monitoring criteria. Namely, for blood cadmium, < 5microg/L is considered as low, 5-10 as middle, and >10 as high. For urine cadmium, <3microg/g creatinine is considered as low, 3-7 as middle, and >7 as high. For UB2M, <300microg/g creatinine is considered as low, 300-750 as middle, and >750 as high. These criteria are employed because depending on these levels, different actions are mandated by OSHA. That is, if any of the three tests is in the high range, removal of the worker, medical examination and exposure assessment are mandated; if any of the three test is within the middle range, semiannual biologic monitoring, annual medical examination, exposure assessment, and exposure control are obligated; and if any of the three test falls in the low range, only annual biologic monitoring and medical examination of every two years are required. Secondly, the association between these levels and hemoglobin level is examined using logistic regression model. The analysis is conducted with SPSS software.

At present, this study is in the data analysis phase, and the results will be discussed at the conference.