Current MITHE-SN Projects Metadata

**I5 Dr. Beverley Hale (P.I.) – Associate Dean (Research and Innovation), Ontario Agricultural College**

**Bioaccessible and Bioavailable Metals in Foods (Foods + Ingested Particles)**

**Objectives being Investigated**
The use of bioaccessible metals in contaminated soils as site-specific soil criteria for assessing risk is gaining regulatory acceptance as an alternate to generic criteria, although it is an approach that is somewhat in its infancy. The barrier to greater comfort with these in vitro assays is that few have been validated with in vivo data. This project will evaluate several in vitro methods for determining the bioaccessible metals in soils from contaminated sites; the criteria for evaluation will be primarily their correlation with in vivo data (which will be conducted in this project) but also their reproducibility in a laboratory setting. The metals of focus are Cu, Cd and Ni, as these metals are of interest to a number of MITHE-RN partners, and are scantly addressed in existing bioaccessibility studies, most of which have focussed on As and Pb.

**Study/Sampling Design**
There are a number of studies, each with its own sampling design. The laboratory work is carried out using field-contaminated soils or plant material, or, plant material that has been grown to incorporate the metals under investigation. Where sample material has been obtained from Project I2 a comparison of the detailed mineralogical will be made with bioaccessibility tests of the same material.

**Number of projects providing material for study: 0**

**Location of Field Site(s)**
--- none provided ---

**Human Studies**

*Outcome or Process Studied*
Absorption of solubilized metals by cultured human intestinal epithelial cells. Comparisons of bioaccessibility *(in vitro)* tests and arsenic excretion in urine after ingestion of a traditional Chinese medicine (bioavailability).

**Exposure Medium, and Metals/Substances Quantified**
Simulated gastric/intestinal fluid
As, Cd, Cu, Ni, Pb and Zn

**Biological Endpoint(s) Monitored**
Tissue accumulation of metals, human urinary excretion of As.

**Biota Studied**

**Species**
Leafy vegetables, grain

**Metals, etc. Quantified**
As, Cd, Cu, Ni, Pb and Zn

**Biological Endpoint(s)**
--- none provided ---

**Physical Material(s) Studied**

**Medium/Media**
Soils, herbal medicines

**Metals, etc. Quantified**
As, Cd, Cu, Ni, Pb and Zn

**Bibliographic References on-file with Secretariat:** No

**Data Available:** Yes

**Data Archived with MITHE-SN:** No

**Collaborators**

**Dr. Chris Ollson** (Co-Inv.) – Chemistry/Chemical Engineering, Royal Military College, CFB Kingston

**Dr. Ken Reimer** (Co-Inv.) – Chemistry/Chemical Engineering, Royal Military College, CFB Kingston