

Select potato genotypes based on concentration of minerals, nutrients and functional food compounds

- ***Activity 3.2. Identification of functional foods***
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- **Objective:** To select potato genotypes based on concentration of minerals, nutrients and functional food compounds

# Experimental approach

- A total of 42 clones, including 12 advanced yellow clones of UNC, 8 cultivars selected from indigenous communities, and 10 genotypes from *S. phureja* will be analyzed for the presence and relative amounts of phytonutrients
  - non-target analysis, based on metabolomics tool using hybrid mass spectrometry (Bollina et al. 2010; Hall et al. 2008)
- Selected potatoes will be lyophilized, subjected to ethanolic extraction procedures and stored at -80C

**Extracts of Polyphenol-rich Potatoes**

**+**

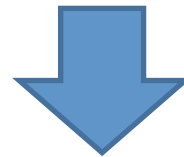
**Simulated human gut model**

Digestive enzymes

Bacterial metabolism



***Bioactive polyphenolics***



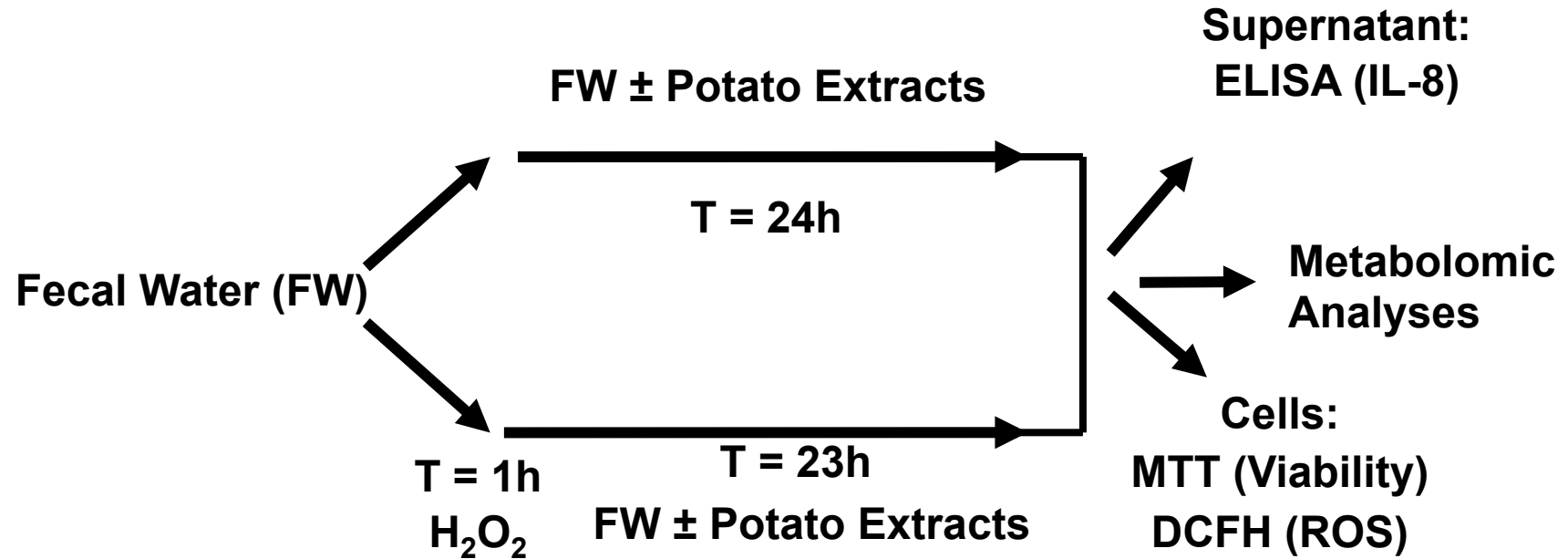
**Human Colon Cell Culture Model of  
Inflammatory Bowel Disease**



Oxidative Stress

Inflammation

# Effects of Digested Potato Extracts on Caco-2 Cells



# ***Materials required***

- HPLC supplies (columns, gases, vials, filters)
- User fees for LC and hybrid MS
- Human simulated gut model studies (digestive enzymes, gases, chemicals)
- Cell culture supplies (Caco-2 cells, gases, filters, chemicals)

## ***Requirements from others***

- Require collaboration for lyophilization of potatoes
- Human simulated gut model studies will require 90% aqueous ethanol extraction of concentrated freeze-dried extract
- Shipping of freeze dried material

# ***Start and end time period for experiments***

- Delivery of potato extracts (estimated September 2012)
- Polyphenolic characterization of potato extracts via HPLC and MS analyses (September-December, 2012)
- Utilize Dynamic Human Gastrointestinal Model to generate potato polyphenolic digests (January-February, 2012)

## ***Start and end time period for experiments***

- Test potato extract digests in Caco-2 cell culture model (March-April, 2012)
- Carry out analyses on inflammatory and oxidative stress markers and metabolomics (May-July, 2012)



# ***Deliverables/milestones***

- Determine clones that contain phytochemical composition with the most potent antioxidant and anti-inflammatory properties
- Identification of the clones that could be further investigated regarding their functional health properties that could benefit indigenous communities

# ***Deliverables/milestones and time period***

- Provide mechanistic information regarding the key metabolites involved in the antioxidant and anti-inflammatory properties of the potato extracts