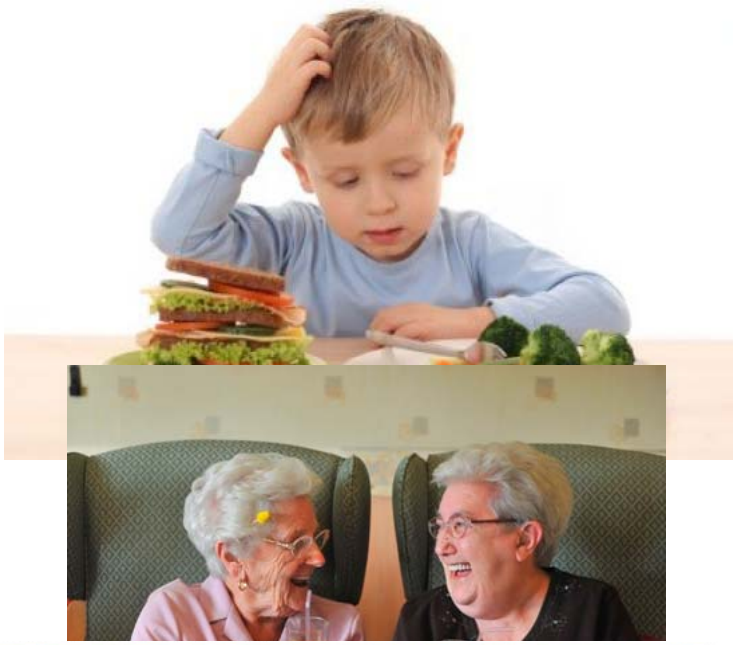
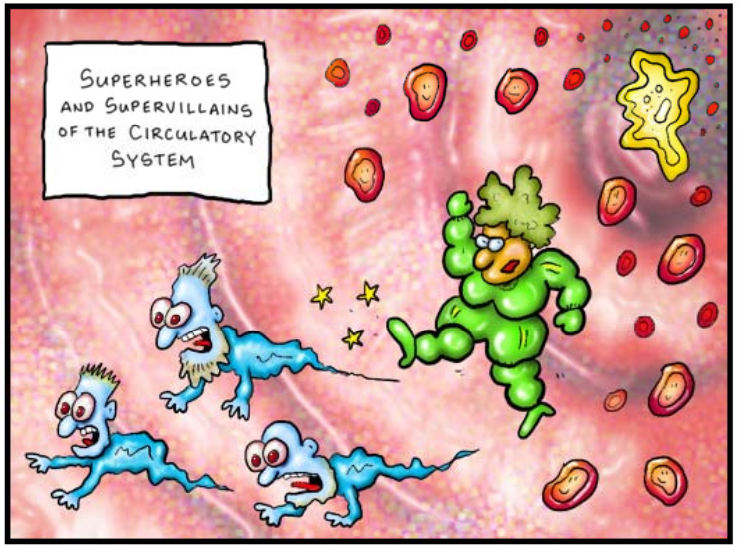
The impact of the soft fruit on degenerative diseases – metabolic fate and mechanisms of action

The Interreg IVB North Sea Region Programme

Future-proofing berryfruit ClimaFruit

Annual ClimaFruit Meeting 2011
Norway, Lillenhamen
Katarzyna Goszcz
PhD student





Auntie Oxidant kicks out the Free Radicals.

Media

Eat healthy food

Live long

Antioxidants = decreased risk of diseases development

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Berry →„superfruits”

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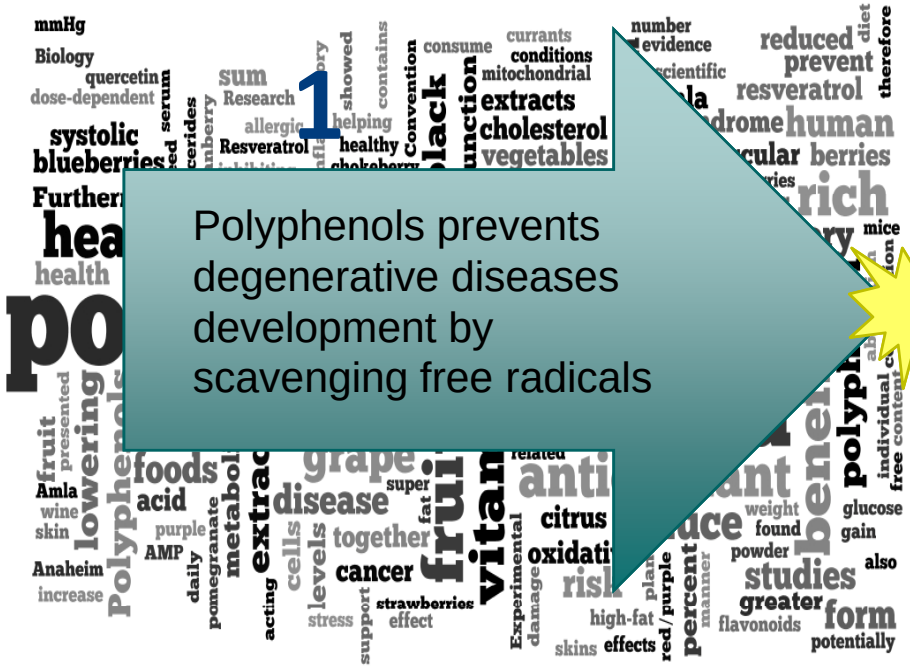

Polyphenols prevents degenerative diseases development by scavenging free radicals

2

Polyphenols do not have actual antioxidant potential within human body, but may act as biological agents

Main aims of the project

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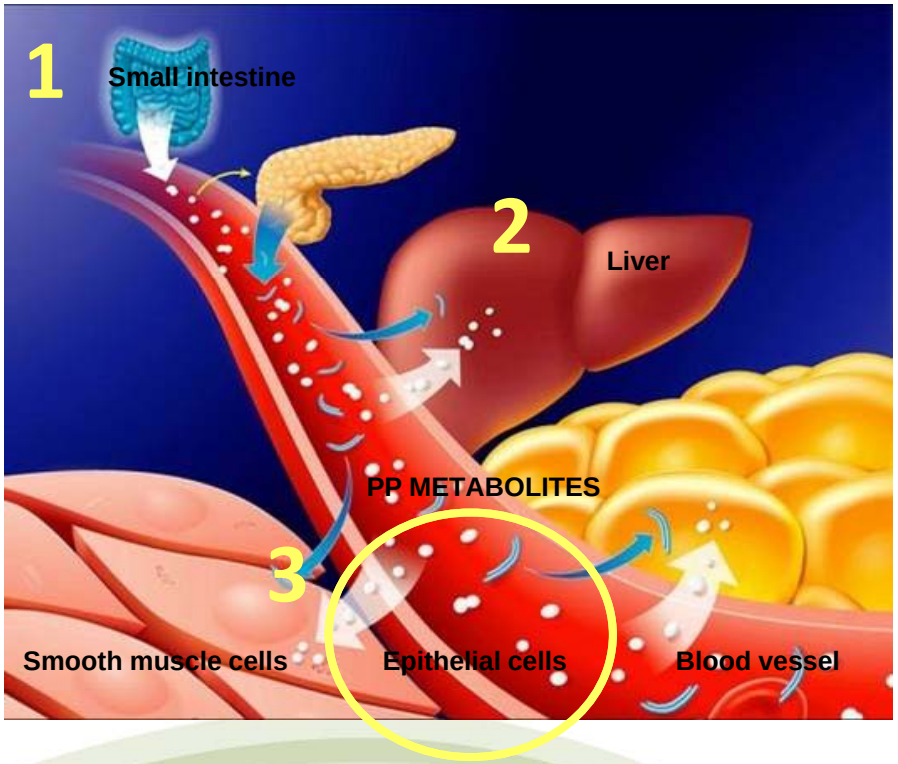
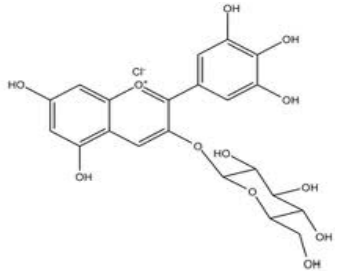
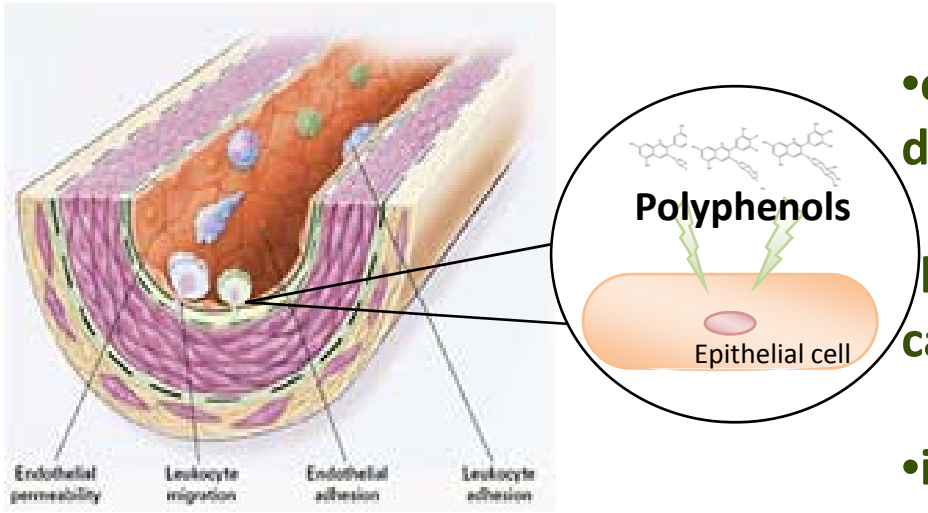
- understand polyphenols mechanism of action within the human body
- investigate their role in prevention of cardiovascular disease development

Metabolic fate of consumed polyphenols





Epithelium…



- Polyphenols may exert modulatory actions in epithelial cells
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- form barrier between vascular space and tissues
- enable transport of nutrients directly from the blood to the cells
- bind to the cell membrane receptors
- by producing nitric oxide (NO) causes smooth muscle relaxation
- modulate gene expression and protein synthesis
- implicated to several diseases: atherosclerosis, hypertension, inflamatory diseases

Work done so far…

1. **Extraction of polyphenols from target fruit**
2. **Phytochemical analysis**
3. **Measurement of antioxidant potential**
4. ***In vitro* synthesis of polyphenol metabolites**
5. **Determination of polyphenol degradation pattern**

The target fruits were extracted with 0.1% formic acid and acetonitrile.

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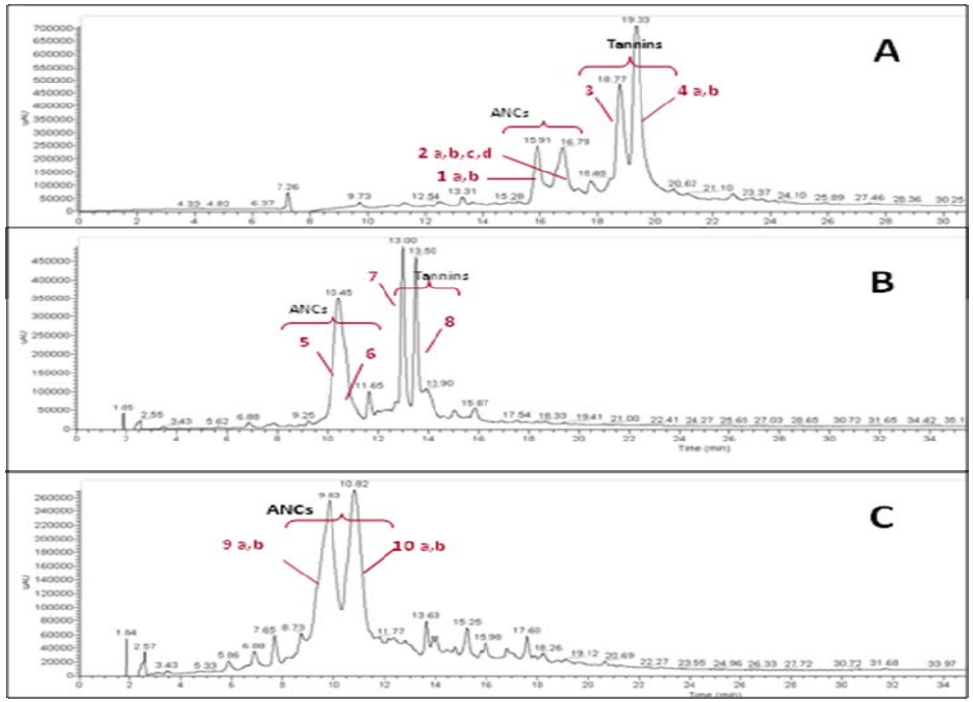

PDA profile of phenolic compounds in raspberry (A), blackberry (B) and blackcurrant (C) extracts.

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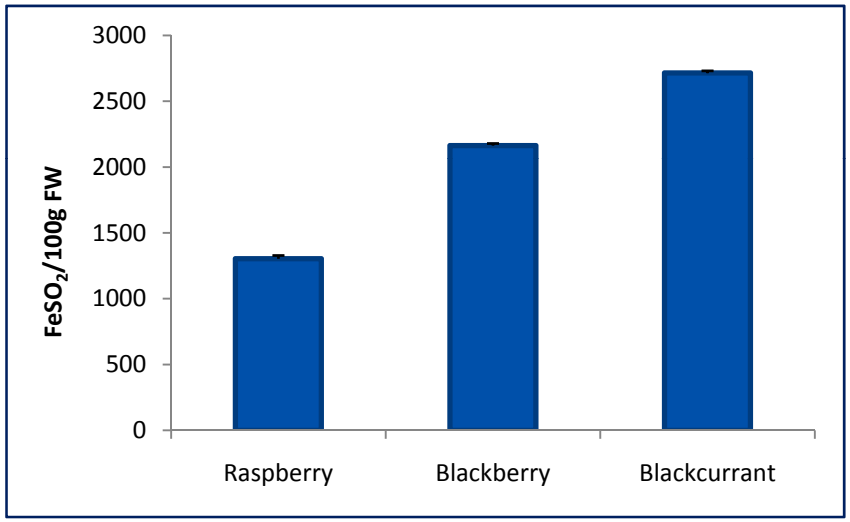

Total antioxidant potential of obtained extracts and fractions measured by FRAP assay

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Future studies...

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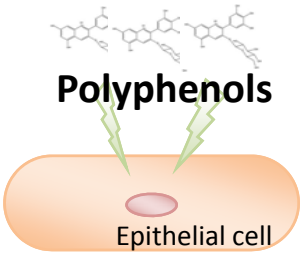

1. Extract and selected polyphenols will be subjected to *in vitro* metabolism

2. Role in protecting against oxidative stress and inhibition and /or retardation cardiovascular disease will be elucidated of polyphenols

3. Bioabailability and bioefficiency in mammalian system will be tested

Thank you…

- The Interreg IVB Borth Sea Region Programme
- ClimaFruit
- University of the Highlands and Islands
- The James Hutton Institute

Supervisors:

- Prof. Derek Stewart
- Prof. Ian Megson
- Dr. Gordon McDougall