

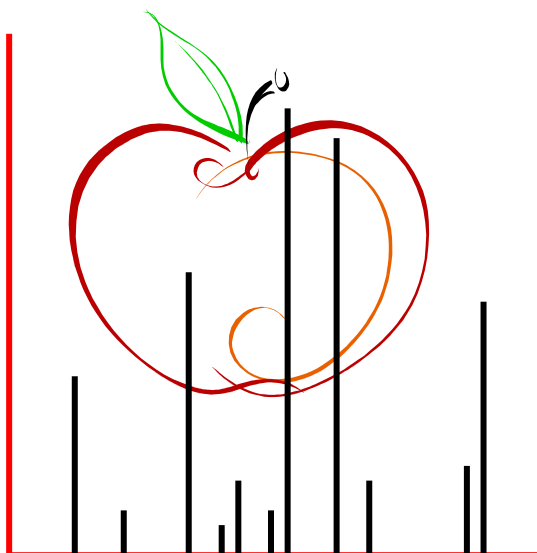
John H. Draper
Shaobo Zhou
Manfred E. Beckmann

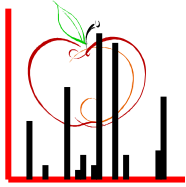


John C. Mathers
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The MEDE Study

Metabolomics to characterise Dietary Exposure





The MEDE Study

Background, Aim and General Design (1)

Measurement of dietary exposure - what foods have been eaten in what amounts - is an essential component of much health-related research

BUT

All the conventional tools for collecting quantitative information on dietary exposure (diet diaries, food frequency questionnaires and 24 hour recalls) are

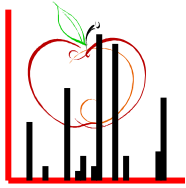
- ✓ **subject to participant bias**
- ✓ **dependent upon food composition tables**



The MEDE Study

Background, Aim and General Design (2)

The MEDE study is designed to discover whether **metabolomics could be an alternative, non-subjective tool** to characterise what people eat without the need for diaries and questionnaires

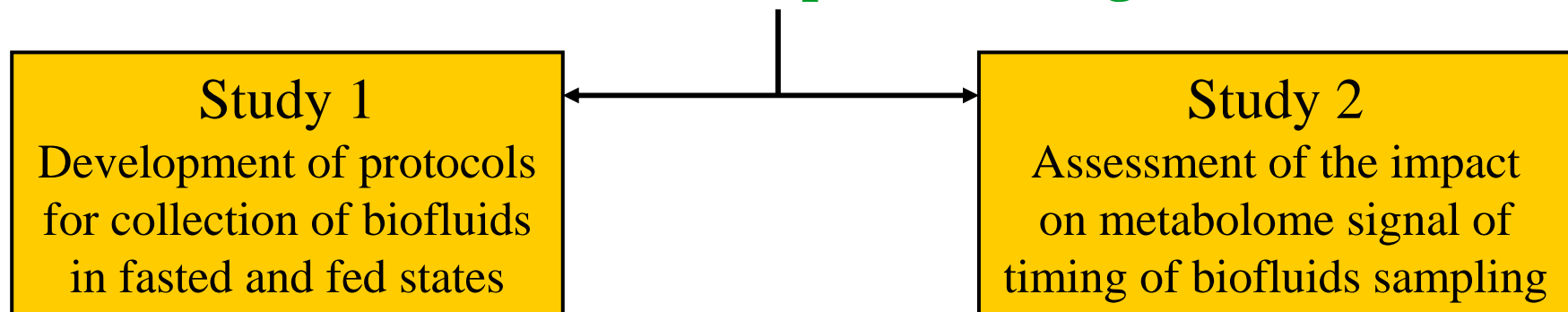


The MEDE Study

Background, Aim and General Design (3)

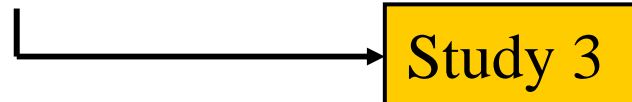
Phase one

Establishment of protocols which allow reproducible determination of the **metabolite profiles of a given individual**



Phase two

Determination of the metabolite profiles of **individuals exposed to specific test meals**





The MEDE Study

Experimental dietary strategy (1)

Phase one - Study 1

Subjects: 12 healthy adult male and post-menopausal female non-smoking volunteers

Study design: 1 study day per volunteer

Previous day

No alcohol

Minimal physical activity

Standardised evening meal

- ✓ “Metabolomically” neutral, balanced and attractive
- ✓ None of the Study 3 test foods
 - ✓ Not a cereal-based meal (GrainMark Study)

Study day Blood (up to 30 mL)
Urine (total void)
Saliva (alternative biofluid)

Fasted state

Fed state: 3h later

Standardised breakfast

Orange juice
Tea with sugar and milk
Croissant
Corn flakes with milk



The MEDE Study

Experimental dietary strategy (2)

Phase one - Study 2

Subjects: 12 healthy adult male and post-menopausal female non-smoking volunteers

Study design: 2 study days per volunteer

Previous day

No alcohol

Minimal physical activity

Standardised evening meal

- ✓ “Metabolomically” neutral, balanced and attractive
- ✓ None of the Study 3 test foods
 - ✓ Not a cereal-based meal (GrainMark Study)

Study day Blood (up to 30 mL)

Urine (total void)

Saliva (alternative biofluid)

Fasted state

Fed state: 2, 4, 6 and 8h later

Standardised breakfast

Orange juice

Tea with sugar and milk

Croissant

Corn flakes with milk



The MEDE Study

Experimental dietary strategy (3)

Phase two - Study 3

Subjects: 24 healthy adult male and post-menopausal female non-smoking volunteers
2 cohorts of 12 volunteers

Study design: 6 study days per volunteer, 4 test foods of public health significance

Previous day

No alcohol

Minimal physical activity

Standardised evening meal

- ✓ “Metabolomically” neutral, balanced and attractive
- ✓ None of the Study 3 test foods
 - ✓ Not a cereal-based meal (GrainMark Study)

Study day Blood (up to 30 mL)

Urine (total void)

Saliva (alternative biofluid)



Fasted state



Fed state: based on Study 2

Standardised breakfast

- or a meal containing one of the test foods
- ✓ 2 test food per cohort
so 2 test food per volunteer



The MEDE Study

Experimental dietary strategy (4)

Phase two - Study 3

Study design: study days a minimum of 1 week apart
test foods randomly consumed

Volunteer	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
1	SB	TF2	SB	TF1	TF1	TF2
2	TF1	SB	TF2	SB	TF2	TF1
3	TF1	TF2	TF2	SB	SB	TF1
4	TF2	TF1	TF2	SB	TF1	SB
Etc...						

SB	Standardised Breakfast
TF1	Test Food 1
TF2	Test Food 2

Standardised breakfast

Orange juice
Tea with sugar and milk
Croissant

Corn flakes with milk

Replaced by

Test foods

TF1: an **oily fish** or
TF2: a **cruciferous vegetable** or
TF3: a **berry fruit** or
TF4: a **wholegrain food**