Melancholic Microbes

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Depression

Sustained sadness and anhedonia

High prevalence

Exaggerated stress responses

Inflammation
Does the gut microbiota play a role in depression?

Is diet important in depression management?
Microbiota in Major Depression
Behavioural and physiological impact of transplant

**Behavioural Profile**

(b) Sucrose Preference
- Controls
- Depression

(c) Open Field
- % visits to the open arms

(d) Elevated Plus Maze
- % visits to the open arms

(e) Forced Swim Test
- immobile
- swimming
- climbing

**Tryptophan Profile**

(f) Tryptophan
- ng/ml

(g) Kynurenine
- ng/ml

(h) Kynurenine/Tryptophan
- Ratio

**Physiological Profile**

(i) CRP
- p=0.08

(j) Lipopolysaccharide binding protein

(k) Corticosterone

(l) Intestinal Motility
- Transit time (minutes)

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Title of presentation
Programming infant gut microbiota
Trier Social Stress Test (TSST)

A) Key Procedural Stages:

1. Baseline Rest
   - Following baseline sample collections participant rests quietly alone in Room A

2. Task Instructions
   - "Imagine you have applied for your ideal job for which you must convince the committee members why you are the perfect candidate"

3. Stress Procedure
   - In Room B:
     - 3 Minute Preparation
     - 5 Minute Speech
     - 5 Minute Mental Arithmetic

4. Recovery Period
   - Participant returns to Room A for recovery and further measures are collected

B) Example Sampling Schedule:

<table>
<thead>
<tr>
<th>Baseline Rest &amp; Task Instructions</th>
<th>Stress Procedure</th>
<th>Recovery Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>t-30 minutes</td>
<td>t0</td>
<td>t+15 t+30 t+45 t+60 t+75</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3 4 5 6 7</td>
</tr>
</tbody>
</table>

Immune Response (Plasma Cytokines)
HPA axis Response (Salivary cortisol)
Psychological Stress Response
HPA response to stress
Trier Social Stress Test

C-section vs. Natural Born

pg/ml

Baseline
STRESS

Natural Born (n=39)

C-section (n=34)

Time (min) -30 t0 t+20 t+35 t+50 t+65 t+80
Trier Social Stress: Psychological Response

(a) TSST Positive Affect
- Mean Score
- Natural Born
- C-Section

(b) TSST Negative Affect
- Mean Score
- Natural Born
- C-Section

(c) TSST Psychological Stress
- VAS (0-100%)
- Natural Born
- C-Section

(d) TSST Psychological Stress (AUCg)
- VAS (0-100%)
- Natural Born
- C-Section
Exam stress: mode of delivery

**State Anxiety**
- Natural Born
- C-Section

**Trait Anxiety**
- Natural Born
- C-Section

**Beck Depression Inventory**
- Natural Born
- C-Section

**Perceived Stress**
- Natural Born
- C-Section
Exam stress: cognitive response

- **Visuospatial Memory**
  - Natural Born
  - C-Section

- **Response Inhibition**
  - Natural Born
  - C-Section

- **Attentional Set Shifting**
  - Natural Born
  - C-Section

- **Reversal Learning**
  - Natural Born
  - C-Section
MyNewGut recommendations for treating depression

Mediterranean diet or modification there of

- Fish
- Grains & Fibre
- Fermented Foods
- Restrict red meat and refined sugar
- Fruit and vegetables
- Regular aerobic exercise
Microbiome Influence on Energy Balance and Brain Development and/or Function Put into Action to Tackle Diet-Related Diseases has received funding from the European Union’s Seventh Framework Programme for research, technological development and demonstration. Grant Agreement no: 613979

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