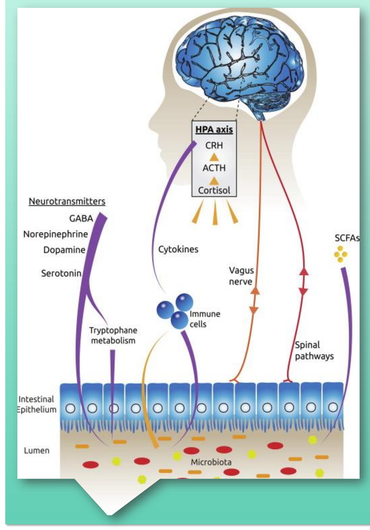
How Your Bacteria Controls You: The Influence of Intestinal Flora on Personality & Mental Health

Hadil K. Ellafi 1297 | 3rd Year Basic Medical Sciences
Libyan International Medical University

Introduction

- A relationship between the brain and gut has been known since hundreds of years ago and is described as the “gut feeling”, suggesting that your gut plays a role in your mood & way of thinking. Recent studies have discovered that this link is **Microbiota**.
- In humans, the most compelling evidence of a gastrointestinal microbe-brain interaction arose more than 20 years ago from the observation of the often dramatic improvement in patients with hepatic encephalopathy, after administration of oral antibiotics.



Microbiota-Gut-Brain Axis

- The gut-brain axis **(GBA)** consists of bidirectional communication between the central and the enteric nervous system, linking emotional and cognitive centres of the brain with peripheral intestinal functions.
- The mechanisms underlying GBA communications involve neuro-immuno-endocrine mediators. (1)

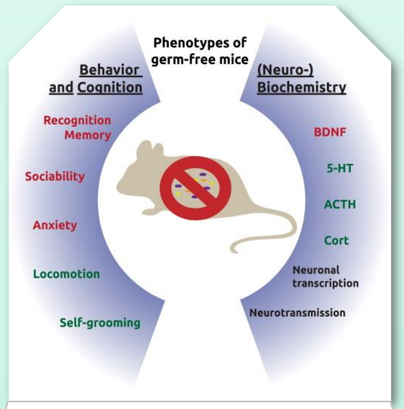
Materials & Methods

- The data in this poster was collected from 3 different studies.
- Due to the high risk of these trials effecting mental health and causing severe complications, they have only been preformed on mice and no human trials are available yet.

Results & Discussion

Microbiota-Gut-Brain Axis & Personality

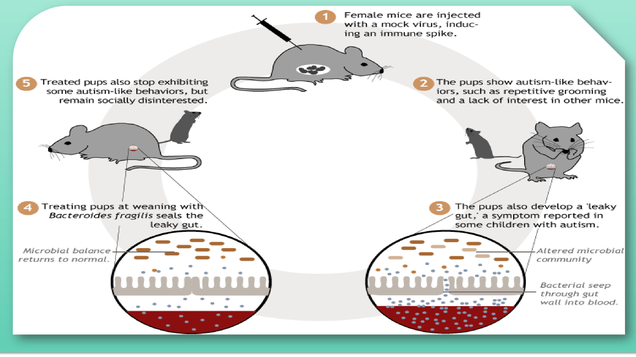
- Environmental and dietary stimuli have always been implicated in brain development and behavioural responses.
- One of the mechanisms by which this axis affects social behaviour is by regulating myelination at the prefrontal cortex, an important site for complex cognitive behaviour planning and decision-making, which can be influenced by microbial metabolites.(2)



Studies on germ free mice showed the absence of microbial colonization is associated to an altered expression and turnover of neurotransmitters in both CNS & ENS. (3)

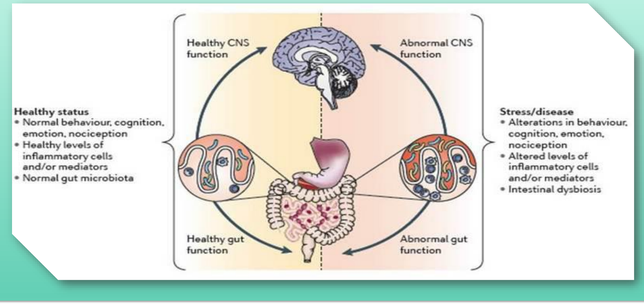
Microbiota & Autism Spectrum Disorder

- Gastrointestinal disorders are a common comorbidity in ASD patients. It was thus hypothesized that a gut-brain link may account for some autistic cases.
- There are mounting reports in animal models and human epidemiologic studies linking disruptive alterations in the gut microbiota or dysbiosis and ASD symptomology. (4)



Conclusion

- The commonly known fact that your gut has some control on your brain is true, and interestingly it is our intestinal flora that does the job.
- Intact and healthy microbiota plays a big role in mood and behaviour.
- This area of research has been rising in the past few years as the link between microbiota & mental health has proposed new ways of treating mental illnesses.



References

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(2) Ntranos A, Casaccia P.*The Microbiome–Gut–Behavior Axis: Crosstalk Between the Gut Microbiome and Oligodendrocytes Modulates Behavioral Responses.* - PubMed - NCBI. *Ncbinlmnihgov*. **(2018).** https://www.ncbi.nlm.nih.gov/pubmed/29282673 .

(3) Farzi A, Fröhlich E, Holzer P. *Gut Microbiota and the Neuroendocrine System.* - PubMed - NCBI. *Ncbinlmnihgov*. (**2018).** https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5794709/

(4) CS Rosenfield*. Microbiome Disturbances and Autism Spectrum Disorders*. - PubMed - NCBI. *Ncbinlmnihgov*. **(2018)**. https://www.ncbi.nlm.nih.gov/pubmed/25852213 .