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Early exposure to food contaminants reshapes maturation of the human brain-gut-microbiota axis

Sarron E *et al.* Food contaminants and perinatal programming

Elodie Sarron, Maxime Pérot, Nicolas Barbezier, Carine Delayre-Orthez, Jérôme Gay-Quéheillard, Pauline M Anton

Abstract

Early childhood growth and development is conditioned by the consecutive events belonging to perinatal programming. This critical window of life will be very sensitive to any event altering programming of the main body functions. Programming of gut function, which is starting right after conception, relates to a very well-established series of cellular and molecular events associating all types of cells present in this organ, including neurons, endocrine and immune cells. At birth, this machinery continues to settle with the establishment of extra connection between enteric and other systemic systems and is partially under the control of gut microbiota activity, itself being under the densification and the diversification of microorganisms' population. As thus, any environmental factor interfering on this pre-established program may have a strong

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Early Life Experience and Gut ... - PubMed Central (PMC)

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4583334

Early life gut microbiome dysbiosis in high risk infants with negative experiences may represent an accumulated stress response and physiologically traumatic event, which potentially leads specifically to subsequent psychopathology through the **brain-gut-microbiota axis**. 27 Studies from animals and **human**, directly or indirectly, have shed light ...

Cited by: 22 **Author:** Xiaomei Cong, Wendy A. Henderson, Joerg...
Publish Year: 2015

The Gut–Brain Axis and the Microbiome: Mechanisms and ...

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6999848

Based largely on results from preclinical studies, the concept of a brain gut microbiome **axis** has been established, mediating bidirectional communication between the gut, its microbiome, and the nervous system. Limited data obtained in **human** beings suggest ...

Cited by: 15 **Author:** Vadim Osadchiy, Clair R. Martin, Emeran A. ...
Publish Year: 2019

Targeting the gut microbiota to influence brain ...

https://www.sciencedirect.com/science/article/pii/S014976341730670X

Early dietary **exposure** via **human** milk or infant formula is a central driver influencing gut microbiota composition **development** over the first few postnatal months (Wopereis et al., 2014). Before the introduction of solid **food**, the gut microbiota of breast-fed infants is dominated by bifidobacteria, whereas formula-fed infants often also host ...

Cited by: 5 **Author:** Shugui Wang, Louise Harvey, Rocio Martin, ...
Publish Year: 2018

The microbiome-gut-brain axis during early life regulates ...

https://www.nature.com/articles/mp201277

Jun 12, 2012 · Bacterial colonisation of the intestine has a major role in the post-natal **development** and **maturation** of the immune and endocrine systems. ... in rodents to **human** ... brain **axis** during **early** life ...

Cited by: 844 **Author:** G Clarke, S Grenham, P Scully, P Fitzgerald, ...
Publish Year: 2013

(PDF) Brain-Gut-Microbiota Axis in Alzheimer's Disease

https://www.researchgate.net/publication/330372000...

Disturbances along the **brain-gut-microbiota axis** may significantly contribute to the pathogenesis of neurodegenerative disorders. Alzheimer's disease (AD) is the most frequent cause of dementia ...

The Microbiota-Gut-Brain Axis | Request PDF

https://www.researchgate.net/publication/335540961...

In the last 15 years, the gut microbiome has emerged as one of the key regulators of the **gut-brain** axis, leading to the new concept of the **microbiome-gut-brain** axis (also called the **microbiota-gut** ...

Microbial exposure and human health - ScienceDirect

https://www.sciencedirect.com/science/article/pii/S1369527418300535

However, the majority of **microbial exposures** are benign and in fact could be essential in **human** development . During the phase of **human** development in which the majority of people lived a hunter–gatherer lifestyle, diet and environmental interaction characteristics are likely to have had a significant impact on our ancestors **microbial exposure**, which will have shaped the selection of ...

Cited by: 7 **Author:** Anukriti Sharma, Anukriti Sharma, Jack A G...
Publish Year: 2018

Frontiers | Epigenetic Matters: The Link between Early ...

https://www.frontiersin.org/articles/10.3389/fped.2017.00178

Aug 22, 2017 · The epigenetic effects of **prenatal exposure** to chemical food contaminants, such as **phthalates** and **bisphenol** A (BPA), are in the early stages of elucidation. **Phthalates** are ubiquitous plasticizers mainly used in the manufacture of **polyvinyl chloride products**; food packaging and contact materials are considered the major sources of food contamination.

Cited by: 26 **Author:** Flavia Indrio, Silvia Martini, Ruggiero Franc...
Publish Year: 2017

Frontiers | Gut-Brain Psychology: Rethinking Psychology ...

https://www.frontiersin.org/articles/10.3389/fnint.2018.00033

Humans provide living space and **food for the microbiota** and unconsciously regulate the composition and number of **microorganisms**, while the **microbiota impacts the maturation and function** of **human beings** (Ulvestad, 2009).

Cited by: 29 **Author:** Shan Liang, Xiaoli Wu, Feng Jin
Publish Year: 2018

Beyond the looking glass: recent advances in understanding ...

https://www.nature.com/articles/s41386-020-0648-5

Feb 28, 2020 · A recent rodent study by Stansfield et al. found that chronic **exposure** to environmentally relevant concentrations of Pb (average 22 µg/dL) during **early** brain **development** produced selective loss ...

Author: Jonathan A. Hollander, Deborah A. Cory... **Publish Year:** 2020

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The Gut–Brain Axis and the Microbiome: Mechanisms and ...

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6999848

Gut Microbiota to Brain Signaling. Communication from the gut microbiome to the central nervous system (CNS) primarily occurs through microbial-derived intermediates, with the best described examples including short-chain fatty acids (SCFAs), secondary bile acids (2BAs), and tryptophan metabolites. 1–3 Although some of these intermediates interact directly with enteroendocrine ...

Cited by: 15 **Author:** Vadim Osadchiy, Clair R. Martin, Emer...
Publish Year: 2019

Gut Microbiota-brain Axis - PubMed Central (PMC)

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5040025

Oct 05, 2016 · I ntroduction. The latest research showed that changes in gut microbiota could affect the brain's physiological, behavioral, and cognitive functions.[1,2,3,4,5] In 2013, the United States launched a special research project on **gut** microbiota-brain **axis**.Since then, this field, especially the interaction between gut microbiota and the brain, has gradually become the focus ...

Cited by: 31 **Author:** Hong-Xing Wang, Yu-Ping Wang
Publish Year: 2016

Targeting the gut microbiota to influence brain ...

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Publish Year: 2016

The Gut-Brain Axis, the Human Gut Microbiota and Their ...

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6052131

Jul 12, 2018 · The Gut-Brain **Axis**, the **Human** Gut Microbiota and Their Integration in the **Development** of Obesity. ... in addition to playing a significant role in initiating the gut-brain **axis** to control **food** intake, energy expenditure and glucose utilisation (Cheung et al., 2009; ... that link the gut microbiota with the gut-brain **axis** in the **development** of ...

Cited by: 15 **Author:** Edward S. Bliss, Eliza Whiteside
Publish Year: 2018

Microbiota and the gut–brain axis | Nutrition Reviews ...

https://academic.oup.com/nutritionreviews/article/73/suppl_1/28/1819270

Jul 11, 2015 · The **gut microbiota** is composed of trillions of microbes that influence normal physiology and alter the host's susceptibility to disease. 1 A growing body of evidence in animals supports the concept that the gut microbiota influences emotional behavior. 2–6 Changes in the **gut microbiota** or **intestinal exposure** to specific bacteria can **modulate** the peripheral and central nervous systems (CNS) in animals, resulting in **altered brain** ...

Cited by: 133 **Author:** John Bienenstock, Wolfgang Kunze, Paul...
Publish Year: 2015

Intestinal Microbiota in Early Life and Its Implications ...

https://www.sciencedirect.com/science/article/pii/S1672022919300579

The following sections summarize the recently acquired evidence regarding the formation and