

Summary

Dossier

From gut to the brain

Francesco Bottaccioli

We have been thinking that the intestine influenced the brain through the digestion products. Now we are finding a new link in the brain-gut axis: gut flora.

Omega-3: The anti-stress nutrients

A.Minelli - E. Ponzio - I. Annino

It seems plausible that the polysaturated fatty acids contained in fish can break the vicious circle between inflammatory response and stress.

Interview with Eva Jablonka

The Fall of a Taboo: Lamarck's theories.

Paola Emilia Cicerone.

Interview with the biologist and philosopher, Eva Jablonka. Science in Israel is proving the inadequacy of the neo-darwinian model and the need to recover a global vision on evolution.

Human network

Society and health

Unequal for social status and health.

N.Agabiti - M.Davoli - C. Perucci.

In Italy the most disadvantaged social classes have a lower health status compared to the better off. They tend to require more hospitalization and the risk to receive inappropriate treatment is higher.

Theoretics -

Wide ranging reflections

Integrating different knowledge

Gianangelo Palo

The application of the dialogic method may allow to solve the dilemma between pharmacotherapy and psychotherapy just because the body-dimension can be useful to psychotherapy.

Review

Mind enzymes - stress and work

News

Vegetables and genetic

Anna Giulia Bottaccioli

Identified the role of thiocyanate contained in fruit in vegetables for the treatment of cystic fibrosis.

Pnei news n.1 - 2010

Short news from scientific literature

Andrea Delbarba

Calendar

Events in the next months

Sipnei

A continual growth

Lara Bongiorno

Editorial

Francesco Bottacioli – Sipnei Honorary President

From gut to brain

In the social imaginary and literature of all eras, beside being connected to food, the gut has always been considered as the seat of emotions and feelings which are by nature mostly intense and uncontrollable. “Acting on gut instincts” means acting emotionally without thinking.

There is also a social gut. We say “that political leader indulges on the people’s gut feelings” to indicate someone pandering to feelings which are often non-rational and do not have any logical foundation such as fears, aversions, race and religion conflicts, as well as discrimination on sexual orientation.

On one side the gut manufactures feelings and on the other side it is a victim of them. The classical “butterflies in the stomach” or “stomach in knots” when dealing with worries, problems, important trials....

The Ancient Greeks did not have any doubt about this regard. For Plato the abdomen was the seat of the appetitive soul, the seat of desire, which had to be kept under control by the rational soul residing in the head.

This was a very fortunate idea as it survived in time and twenty-three centuries later was then resumed in the Freudian concept of the subconscious, the seat of pulsions (the abdomen of psyche).

Since the late 80s we know that the gut is much more than a tract managing the digestion. It is also a powerful neuroendocrine-immune complex with an enteric brain provided with 500 millions neurons. A quantity of nervous cells that are more or less the same as in the spinal cord. Connected to the gut brain there is an immune system of huge dimension with all its set of known cells and some peculiar ones such as gamma/delta T lymphocytes and the NKT. Lastly, through the whole length of the intestinal tract lining there are different kinds of cells releasing an enormous quantity of hormones (gastrine, cholecystokinin, VIP, melatonin etc.) and neurotransmitters (serotonin, acetylcholine, catecholamine).

But the most surprising aspect is that our gut is colonised by an amazing number of microorganisms: 100 thousand billions! These microorganisms play a very important role in the regulation of intestinal functions and the interactions between the gut–brain axis and emotions. Until now we knew that this network was fundamental for the balance of the immune system. In the dossier of this issue, we will explain why this amazing crowd of microbes is so important for our mental health as well as for our feelings and emotions. It is therefore obvious that we need to take great care of our intestine. Naturally with nutrition first, as dr. Minelli and his colleagues explain while describing the anti-stress role performed by the omega-3. It is also important taking stress into consideration since it has direct and proven effects on the intestinal microflora. Both physical and psychological stress have a large impact on the intestinal flora resulting in an overgrowth of bacterial strains such as *Escherichia coli* and other coliform bacteria at the expense of other strains such as lactobacilli and bifidobacteria. Two mechanisms have been identified during the stress response. The

Editorial

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catecholamines (noradrenaline, adrenaline and dopamine) released in the intestine during the stress reaction improve the coliform bacterial adherence to intestinal mucose and on the same time they cause iron release from the molecules that bind it (transferrin and lactoferrin) creating a favourable environment for the bacterial growth. Once more the key word is: integration
To this concept we devote a theoretical reflection with Gianangelo Palo