

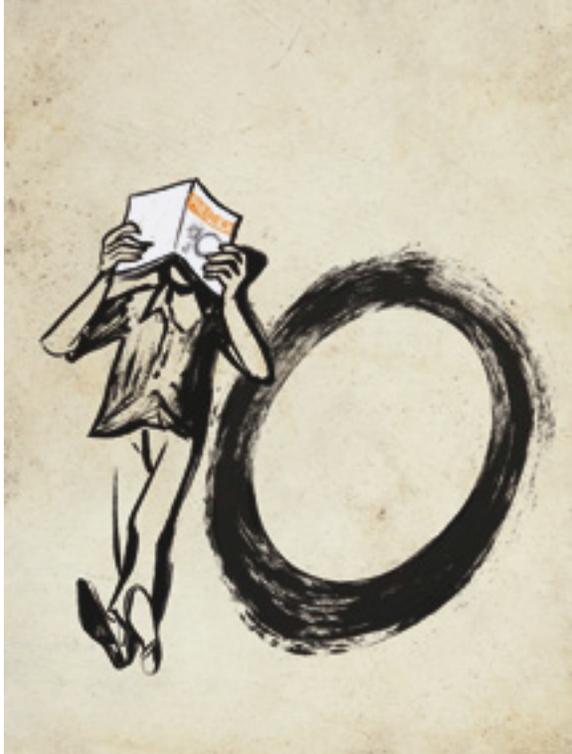
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The review of the Italian association of psycho-neuro-endocrine-immunology

Edited by Francesco Bottaccioli

PNEI NEWS

The new knowledge of science and health



**100 YEARS OF STRESS RESEARCH
(10 YEARS OF PNEI NEWS)**

Pnei News – bimonthly review – nr 6 – year X – November – December 2016

PNEI NEWS NR 5 – SEPTEMBER- OCTOBER 2016

EDITORIAL

Page 3. Anniversaries

Francesco Bottaccioli

STRESS RESEARCH

Page 4. Before and after Selye

80 years ago, Hans Selye's letter to *Nature* signed the landmark in stress research worldwide. Since the beginning of the century Italian researchers had been investigating too the psychoneuroendocrine relationships. Disclosing an unknown story.

Francesco Bottaccioli

Page 7. Lymphocytes: the cells that react to social status stress.

Experiment results are proposing a more and more convincing model of physiological control where the immune and nervous systems communicate directly to each other in both directions. It is emerging a real integrated neuroimmune system whose development allowed the best protection to the organism from a manifold of dangerous environmental conditions including those of behavioural character. A recent study published on *Science* shows how the social role influences the activity of T and B lymphocytes in a community of macaques.

Adriano Angelucci, Mauro Bologna

Page 10. How stress models the body.

Stress response impacts significantly the myofascial system and the bones to such an extent that individuals under chronic stress situation may present many pathologies affecting their anatomical structures.

Manual therapies can restore the organic asset by rebalancing the stress response.

Marco Chiera, Nicola Barsotti, Diego Lanaro

INTEROCEPTION AND STRESS

Page 14. The internal perception is an integrating part of the stress response

Interoception can be defined as the process of being aware, moment by moment, of somatic sensations coming from the body. A more detailed definition depicts interoception as a multidimensional construct including the modalities through which the individual assesses and reacts to such sensations. Interoceptive mechanisms are strictly connected to the stress ones.

Francesco Cerritelli

Page 18. Stress and pain: such a complex relationship requires a PNEI approach

The collective imaginary seems to take for granted the stress/pain relationship. Yet many methodological obstacles arise when we try to analyze this phenomenon scientifically. This is due to the difficulty to assess in an isolated way a comprehensive phenomenon characterized by relationships among systems. An integrative approach is required in order to observe, describe and intervene on this relationship as it involves interconnected and interdependent physiological systems and that has biological, psychological and social effects.

Fausto Spaziante, Francesco Marcheselli, Diego Cortellini

BOOKS

Page 22. Positive psychiatry.

A clinical guide.

EDITORIAL

Anniversaries

Francesco Bottaccioli – Master Director of “PNEI and Science of Integrative Care”, University of Aquila. Sipnei Honorary President.

1916, 1936, 1996, 2006. The first three dates are historically important. The first one commemorates the death of Il'ja Mečnikov, the founder father of cellular immunology, the second date reminds the publication of Hans Selye's first study, the third one commemorates the death of Thomas Kuhn, the distinguished philosopher of science, theorist of scientific revolutions. We will return on the fourth date later.

Scientific immunology has two founder fathers: the German Paul Ehrlich and the Ukrainian zoologist Il'ja Il'ič Mečnikov. Born in 1845, Mečnikov was working at his Marine Laboratory in Messina when he discovered the existence of a type of white blood cells that devour bacteria and other foreign substances. He called them macrophages. He then worked for the rest of his life at the fledgling Institute Pasteur. In 1888 Émil Roux, one of the closest collaborator of Louis Pasteur, identified diphtheric toxins causing diphtheria in the serum of people who had contracted the disease. Two years later, the German physiologist Emil von Behring demonstrated that the serum of animals infected with diphtheria and tetanus contained substances able to counteract the disease. These miraculous substances were named antitoxins or antibodies. Since then the term antibody has become a synonymous for immunity, especially as far as Ehrlich research is concerned. Ehrlich and Mečnikov were awarded with the Nobel Prize for Medicine. Ehrlich's ideas predominated for most of the Twentieth Century while Mečnikov's ideas picked up momentum only at the end of the last century with the arise of a new scientific theory which focuses on immune cells, their plasticity and the complex circuits generated by them. This still progressing theory places the cell balance at the centre of the immune system¹⁻².

According to this concept of balance, in 1936 Hans Selye wrote about the possibility that different stimuli (physical, chemical, emotional) could influence the organism's homeostasis. Having to cope with such physiological changes, the body responses with adaptive or maladaptive reactions. These researches established two capital scientific concepts: 1) emotions disturb physiology as much as bacteria do; 2) a disease is the result of a maladaptation, the inability of the organism to find a new balance. This last concept has been developed towards the end of the Twentieth Century with the theorization of allostasis, defined as the pursuit of a new balance through change³.

The French scientist, Henri Laborit, defined Selye's study as “the discovery of a new scientific continent”. A discovery that can be compared to Christopher Columbus' one. Both America and human body existed already. The discovery was the result of a new paradigm that gave a direction to research, geography and physiology. The paradigm of stress provides the physiopathologist and the clinician with a set of new eyes to observe the functioning of the human organism

both in health and in disease. This is the paradigm shift that Thomas Kuhn described masterfully as he related it to history and physics, a concept that can be applied to the science of medical care too.

In 2006 Pnei News was issued for the first time. In this last decade we have followed these ideas and these teachers in explaining the revolution of Psychoneuroendocrineimmunology.

1. Eberl G. (2016), "Immunity by equilibrium", *Nat Rev Immunol* 16(8): 524-532
2. Bottaccioli F, Bottaccioli AG (2017), *Psiconeuroendocrinoimmunologia e scienza della cura integrata. Il Manuale*, Edra, Milano, cap. 9
3. Sterling P., Eyer J. (1988), *Allostasis: A new paradigm to explain arousal pathology in: Fisher S., Reason J. (Eds.), Handbook of life stress, cognition, and health*, Wiley, Chichester, pp. 629-649.