Twitter Thread by Dennis Zeilstra



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In the reductionistic approach that dominates science, we've tried to categorize even our own physiology into sperate systems such as the immune system or the metabolic system. A number of beautiful papers show that things are not so segmented as we might think. A thread.

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Already almost a decade ago, a brilliant paper in Nature showed that there is crosstalk between the gut microbiome, gut epithelial cells, and immune cells. Moreover, it showed that epithelial cells can take over the immune cell function.
https://t.co/SI1Lqzj445

2/

Than there is this work of art:
https://t.co/O38Gm3P1Nu
The author argues that the immune and metabolic system are likely coevolved and demonstrates that cytokines in fact also act as metabolic hormones. This explains the low-grade inflammation associated with e.g. diabetes.

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A quote:
"The evolutionary advantages of a strong defence system
are obvious [...] As a strong immune response is dependent on energy sources, one can also argue that the integration of these systems and their cooperation [...] would be highly advantageous."

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"From this perspective, an intriguing way to think about this paradigm would be to envision immune mediators, such as cytokines,
as metabolic hormones. In fact, this aspect of immunometabolism is
extremely well-conserved among organisms"

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On the author's website the supplementary data includes long lists of evidence that cytokines such as IL-6 and TNF have metabolic effects:
https://t.co/pSUf09kyvZ

6/

The further researchers dig, the more complex things turn out to be. This intriguing paper, published two weeks ago, identifies nerve cells residing in the gut that *autonomously* can regulate blood glucose and insulin:
https://t.co/OxF3x9aqt4

7/

It shows that insulin respons is not only centrally regulated. It is autonomously regulated from within the gut as well, responding to bacterial impulses.

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The take home message:
Glycemic response is not just a simple feedback loop acting upon carb intake, the gut microbiome as well as the immune system have a direct roles in metabolic regulation as well.

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