

Modelling molecular processes in weight loss

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Propositions belonging to the dissertation

Modelling molecular processes in weight loss: Regulation of metabolic flexibility

Samar H.K. Tareen, 25th March 2020

1. The molecular landscape of metabolism in the adipose tissue differs substantially between individuals before and during weight loss even when following the same diet.
2. Pyruvate dehydrogenase kinases are one of, if the not the, major regulators of cellular metabolic flexibility.
3. The cross-talk between cellular metabolism and inflammatory signalling suggests a strong regulatory association of localised inflammation with metabolic flexibility.
4. Cellular metabolic flexibility is but one thread in the intertwining fabric of metabolism, obesity and associated chronic illnesses, thus warranting further research to unravel completely.
5. For biological problems lacking detailed observational or analytical data, theoretical biology coupled with appropriate modelling and verification methods can provide crucial predictive information.
6. Personalised medicine stands to benefit strongly from detailed modelling and simulation of the biological processes.
7. Systems biology, as a field, has matured and expanded to the point of harnessing multiple scientific subdomains, developing specialised niches and expertise.
8. Network biology can converge and connect multiple niches of systems biology.
9. The virtualisation of human systems and processes is the new frontier.
10. The creation of a single world comes from a huge number of fragments and chaos.
(Hayao Miyazaki)