Selected problems/cases to stimulate collaborative learning regarding the dynamic flexibility of metabolism

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Metabolic reprogramming has been identified as one of the hallmarks of cancer. Furthermore, it is becoming more and more frequent to establish connection between other diseases and metabolic rewiring. One of us has recently argued that metabolic reprogramming is not driven by disease but instead is the main hallmark of metabolism, based on its dynamic behavior that allows it to continuously adapt to changes in the internal and external conditions [1]. Metabolism is considered by many students a remarkably difficult subject, due to its broad contents and the need of integrate them in a biologically meaningful manner. Collaborative learning strategies could contribute to make it easier for students to study metabolism. Since 2015, we design and use problem-based learning (PBL)-like exercises to help our students to study metabolism and its regulation. In the present communication, the experience with a PBL-like exercise devoted to show that reprogramming is a main hallmark of metabolism will be analyzed and discussed. This collaborative learning approach was monitored through comparisons between scores in pre- and post-tests of knowledge, perception and satisfaction questionnaires, evaluation of students' final reports and final exam scores. Results show an overall high level of satisfaction and higher final exam scores by enrolled students, as compared to those of students that did not take part in these tasks.

References: [1] Medina MA. Metabolic reprogramming is a hallmark of metabolism itself. BioEssays 42, 2000058, 2020.