**Chapter 4**

**General**

Boulanger, E. F. *et al*. (2021). Sugar-phosphate toxicities. *Microbiology & Molecular Biology Reviews* **85**(4), e00123-21. <https://journals.asm.org/doi/abs/10.1128/MMBR.00123-21>

Kopp, D. & Sunna, A. (2020). Alternative carbohydrate pathways – enzymes, functions and engineering. *Critical Reviews in Biotechnology* **40**(7), 895-912. <https://doi.org/10.1080/07388551.2020.1785386>

Serafini, A. (2021). Interplay between central carbon metabolism and metal homeostasis in mycobacteria and other human pathogens. *Microbiology* **167**(6), 0.001060. <https://doi.org/10.1099/mic.0.001060>

**EMP pathway**

**Methylglyoxal bypass**

**Modified EMP pathways**

**Gluconeogenesis**

**HMP pathway**

Malán, A. K. *et al*. (2021). *Herbaspirillum seropedicae* expresses non-phosphorylative pathways for *d*-xylose catabolism. *Applied Microbiology & Biotechnology* **105**(19), 7339-7352. <https://doi.org/10.1007/s00253-021-11507-4>

Zhu, X. *et al*. (2021). Itaconic acid exerts anti-inflammatory and antibacterial effects via promoting pentose phosphate pathway to produce ROS. *Scientific Reports* **11**, 18173. <https://doi.org/10.1038/s41598-021-97352-x>

**ED and modified ED pathways**

Abdelhamid, Y. *et al*. (2021). Structure, function and regulation of a second pyruvate kinase isozyme in *Pseudomonas aeruginosa*. *Frontiers in Microbiology* **12**, 3535. <https://www.frontiersin.org/article/10.3389/fmicb.2021.790742>

Nguyen, A. V. *et al*. (2021). The anoxic electrode-driven fructose catabolism of *Pseudomonas putida* KT2440. *Microbial Biotechnology* **14**(4), 1784-1796. <https://doi.org/10.1111/1751-7915.13862>

**PK pathways**

**Metabolic analysis**