Article

A redox-neutral, two-enzyme cascade for the production of malate and gluconate from pyruvate and glucose

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Supplementary Materials:

Table S1. Atmospheric condition independent variables and their values. O_2 and CO_2 are in % and temperature is in °C.

Coded Levels	-	0	+
O_2, (x_1)	2.5	5	7.5
CO_2, (x_2)	5	10	15
Temperature, (x_3)	45	55	65

Table S2. Box-Behnken design for 3 factors with 3 center points. O_2 and CO_2 are in % and temperature is in °C.

Experiment number	O_2 (x_1)	CO_2 (x_2)	Temperature (x_3)
1	-	-	0
2	+	-	0
3	-	+	0
4	+	+	0
5	-	0	-
6	+	0	-
7	-	0	+
8	+	0	+
9	0	-	-
10	0	+	-
11	0	-	+
12	0	+	+
13	0	0	0
14	0	0	0
15	0	0	0

Table S3. Change in kinetic parameters of GDH in the presence of different pyruvate concentrations.

Kinetic parameters.	Pyruvate concentration (mM)			
	0	10	15	20
K_M (mM)	0.42	0.41	0.95	2.55
V_{max} (mM/min)	0.04	0.03	0.02	0.03

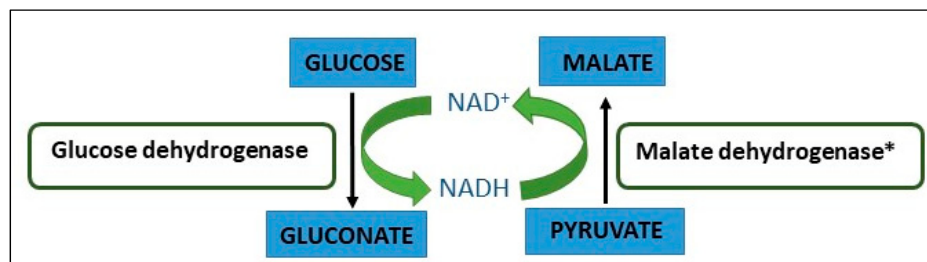**Figure S1.** Schematic representation of redox balanced cascade with cofactor recycling.

Figure S2. Effect of atmospheric conditions and the reaction temperature on the initial rate of MDH*.

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