

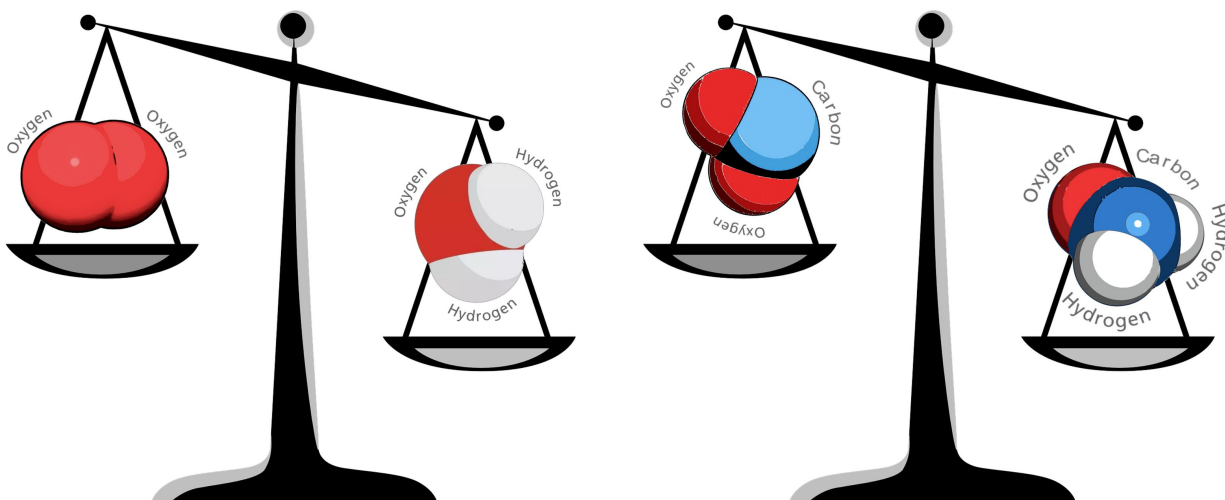
Proto-respiration is the physical basis of life

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Cellular energy is stored in H₂O and CH₂O. The cathode in proto-respiration can be both O₂ and CO₂. The O₂ pathway is the standard proto-respiration pathway, and the latter is for production of carbohydrates, (CH₂O)_n. When the anode in proto-respiration, water (more specifically, hydroxide ions, alkaline water), is "boosted" with carbohydrates, the cathode is the oxygen that was substituted by CO₂ in the carbohydrate pathway of proto-respiration.

The reduction at the cathode in either proto-respiration pathway (oxygen or carbon dioxide) is with hydrogen gas, formed from reduction of hydrogen ions in acid compartment of the acid-base electrochemical cell. $O_2 + 2 H_2 \rightarrow 2 H_2O$ and $CO_2 + 2 H_2 \rightarrow H_2O + CH_2O$. In both the water and glucose pathways, the oxidation at the anode is in hydroxide ions, the alkaline compartment in the acid-base electrochemical cell. $4 \bullet OH \rightarrow 2 H_2O + O_2$ and $CH_2O + 4 \bullet OH \rightarrow 3 H_2O + CO_2$, electrons released when hydroxide ions oxidized to hydroxyl radicals.



To articulate it as simply as possible, cellular energy is stored in H₂O and CH₂O. The cathode in proto-respiration can be both O₂ and CO₂. The three pathways, acid-base cell, carbohydrate production, and carbohydrate discharge, have the same chemical reactions. In all three, the cathode is reduced with hydrogen gas, from hydrogen ions and electrons, and the anode is oxidized with hydroxyl radicals from hydroxide ions. The anode is the same in the acid-base and carbohydrate producing pathways, and the cathode is the same in the acid-base and carbohydrate discharge pathway. Three pathways, two anodes, two cathodes.