

e^- 이동 \Rightarrow 진공 $0.8 \text{ \AA} \rightarrow 10\text{배} \downarrow$

단백질 $1.7 \text{ \AA} \rightarrow 10\text{배} \downarrow$

$15 \text{ \AA} \Rightarrow$ 진공 1 day

단백질 1 msec

Cyt a, b, c, c_1 , b_6 , a_3

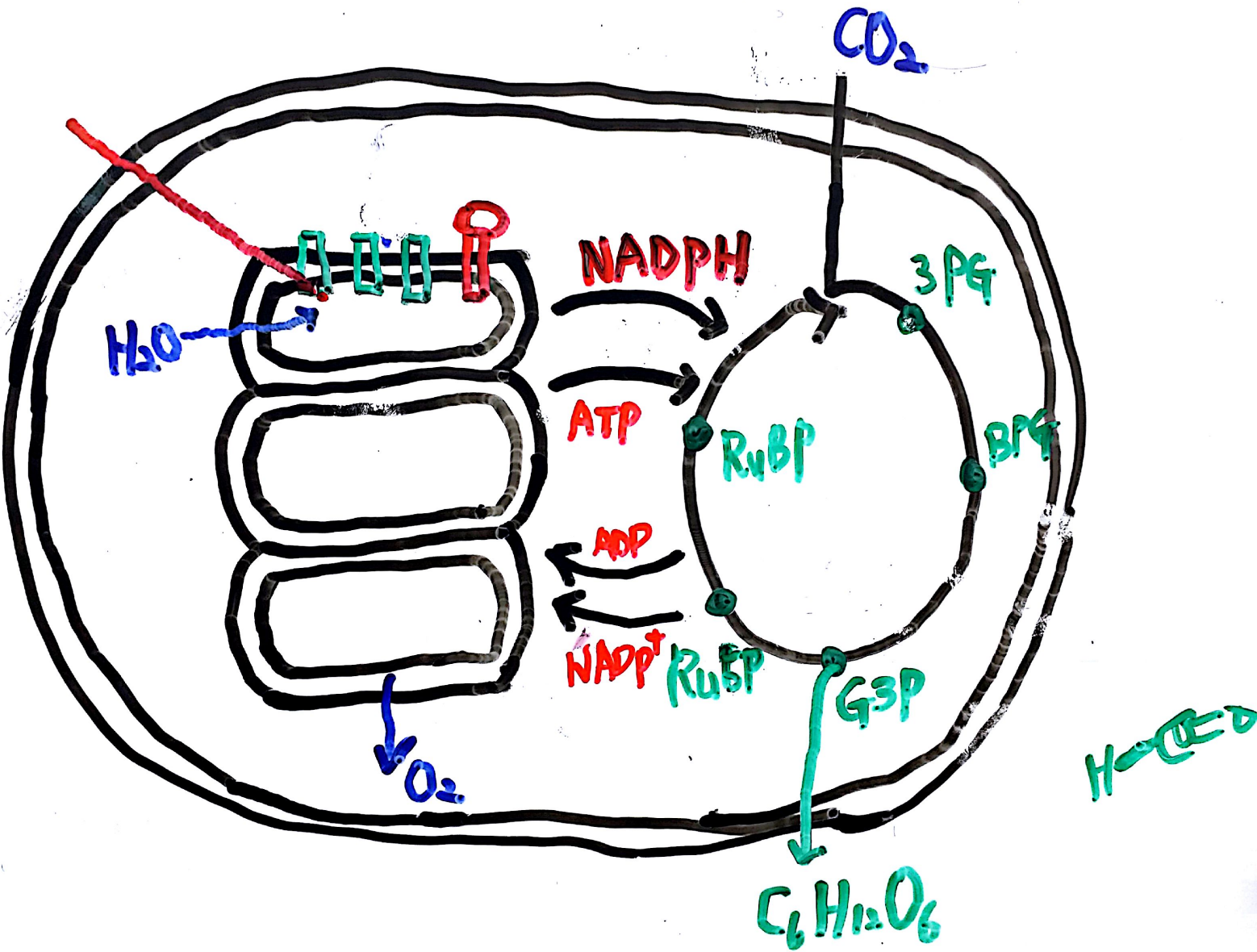
\downarrow \downarrow \downarrow

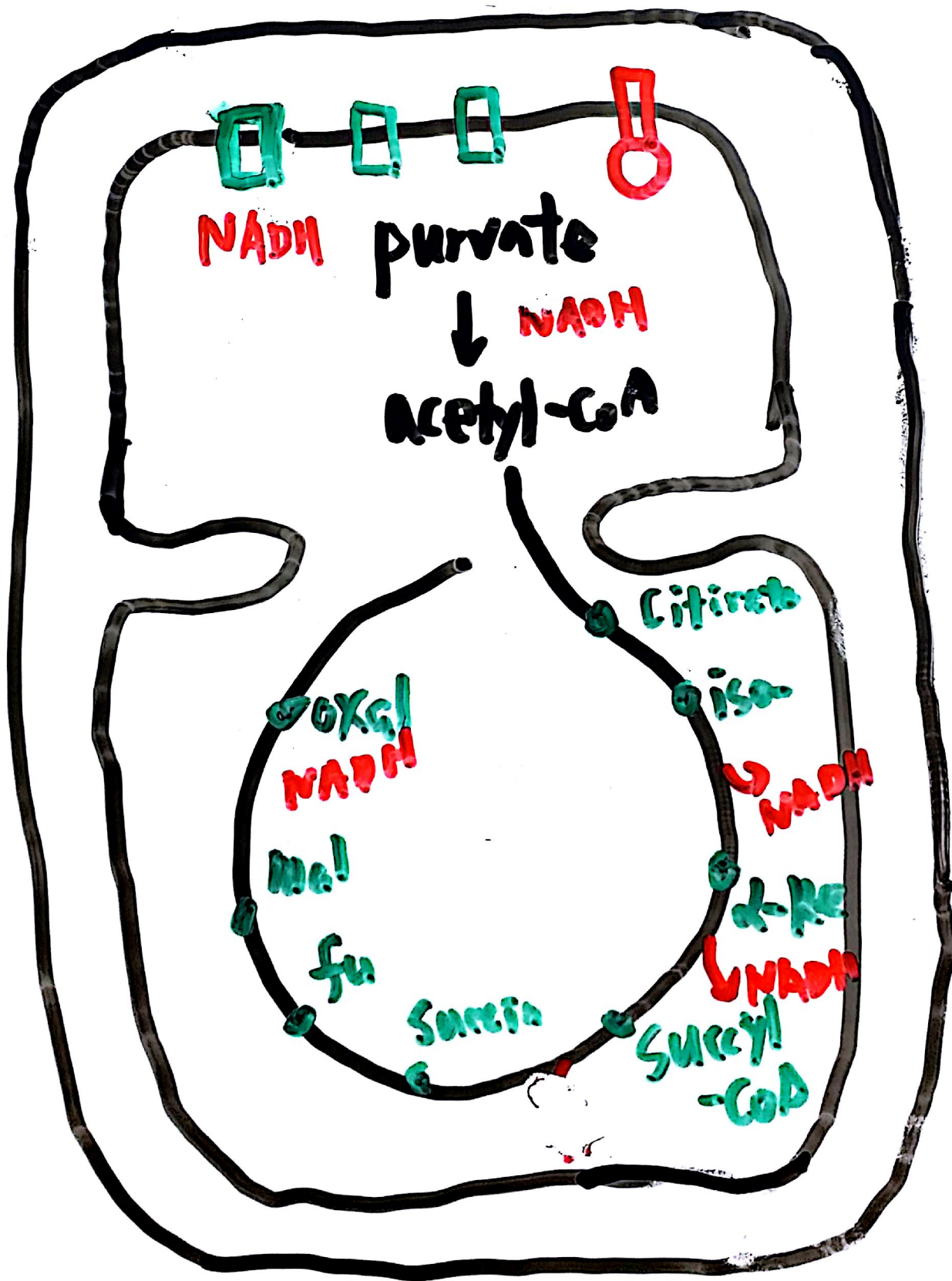
600 nm 560 nm 550 nm

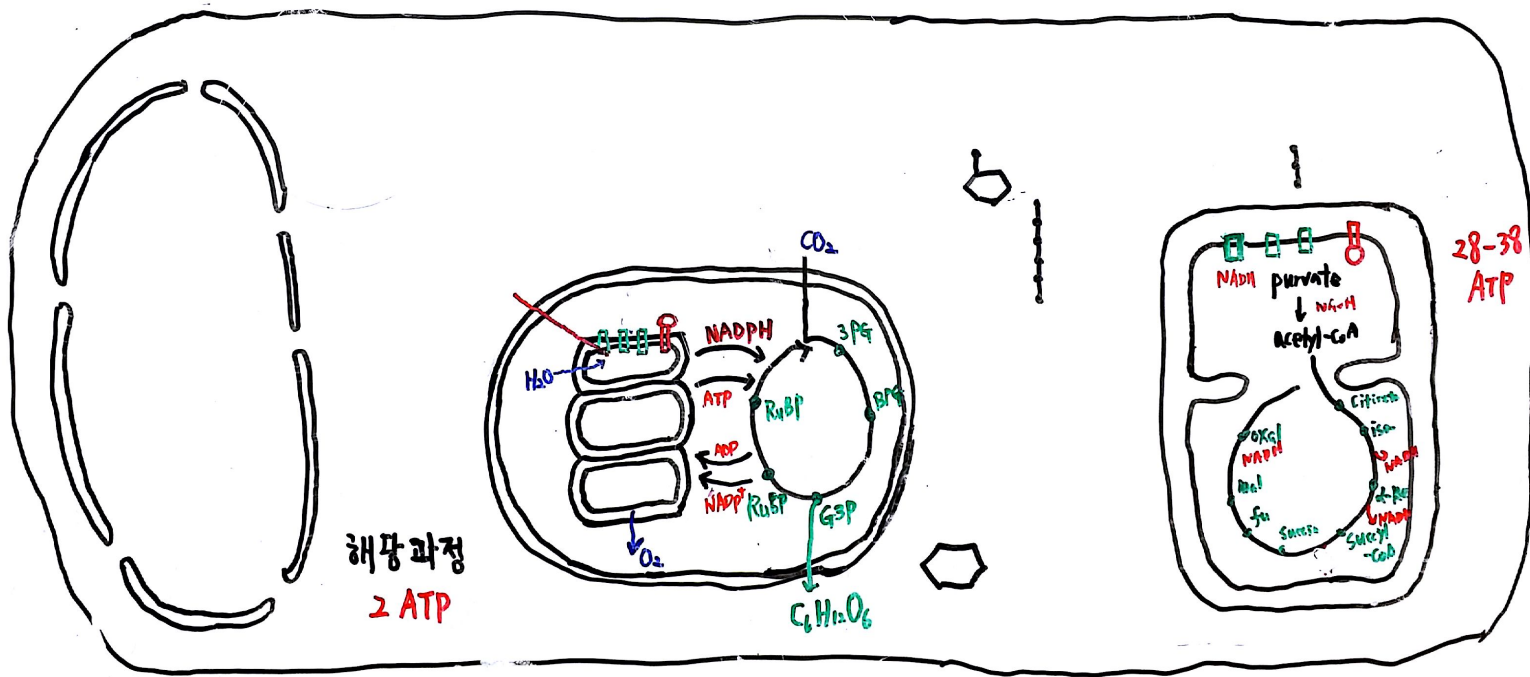
Cyt = Cytochrome

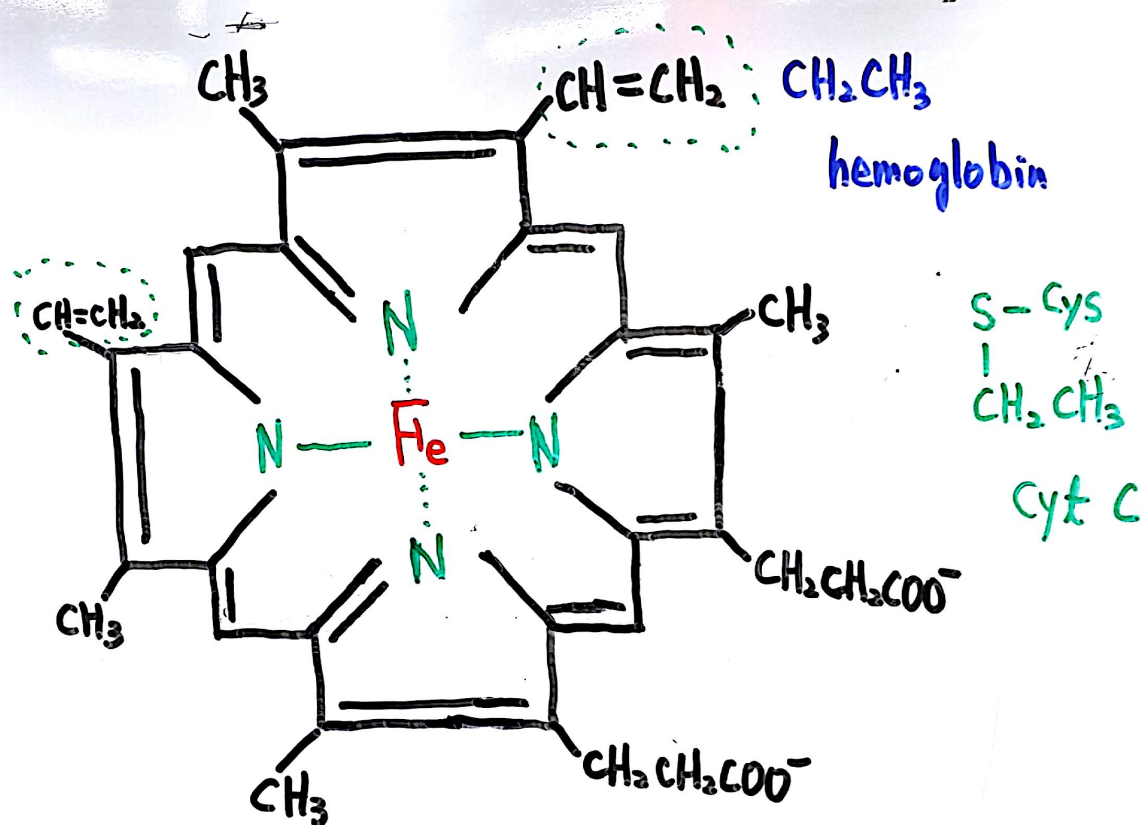
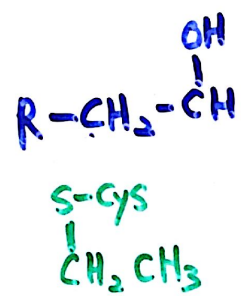
세포 색깔

1931 노벨



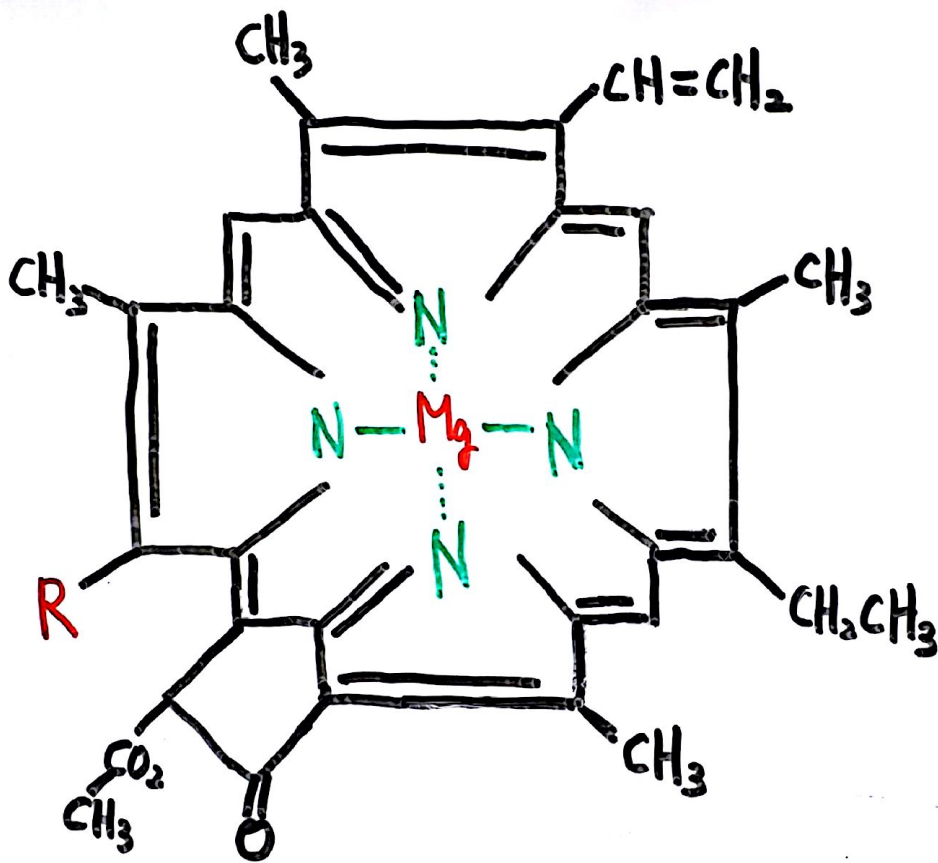






protoporphyrin
 \Rightarrow Cyt b

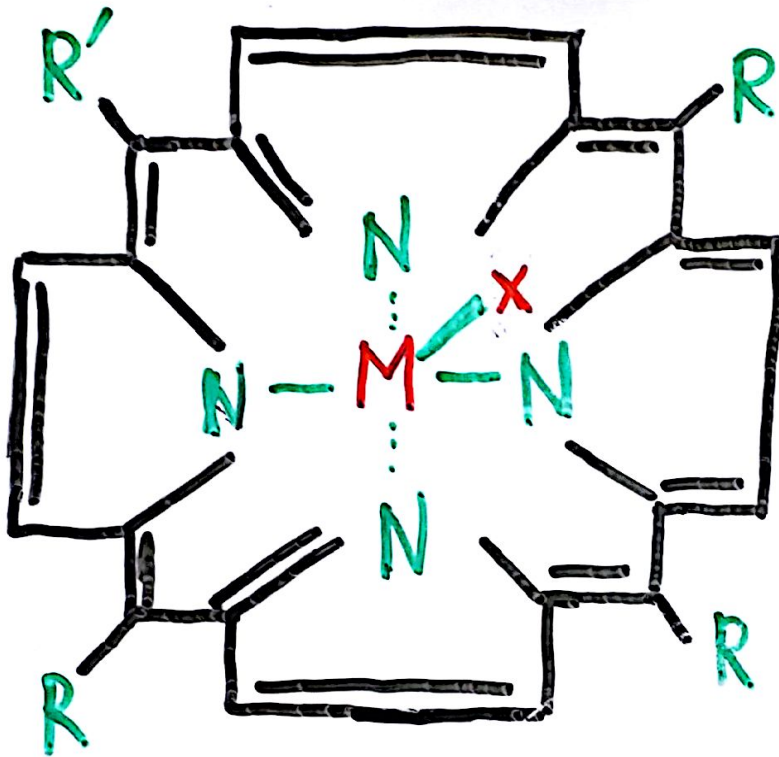
ATP



chlorophyll a \Rightarrow $C_{55}H_{72}MgN_4O_5$

R \Rightarrow phytol $R = CH_2CH_2COOC_{20}H_{39}$

bacteriochlorophyll a \rightarrow $C_{55}H_{74}MgN_4O_5$



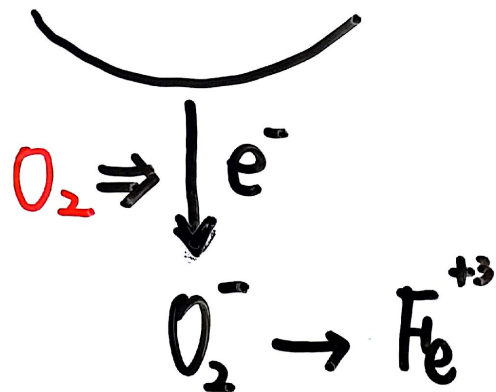
Catalase $M = Fe, X = O$



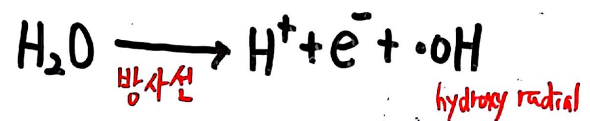
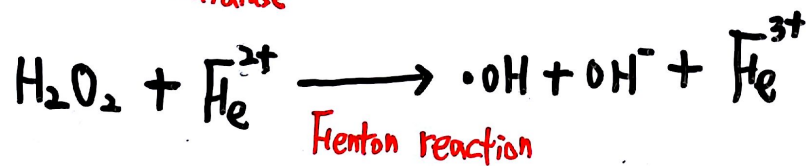
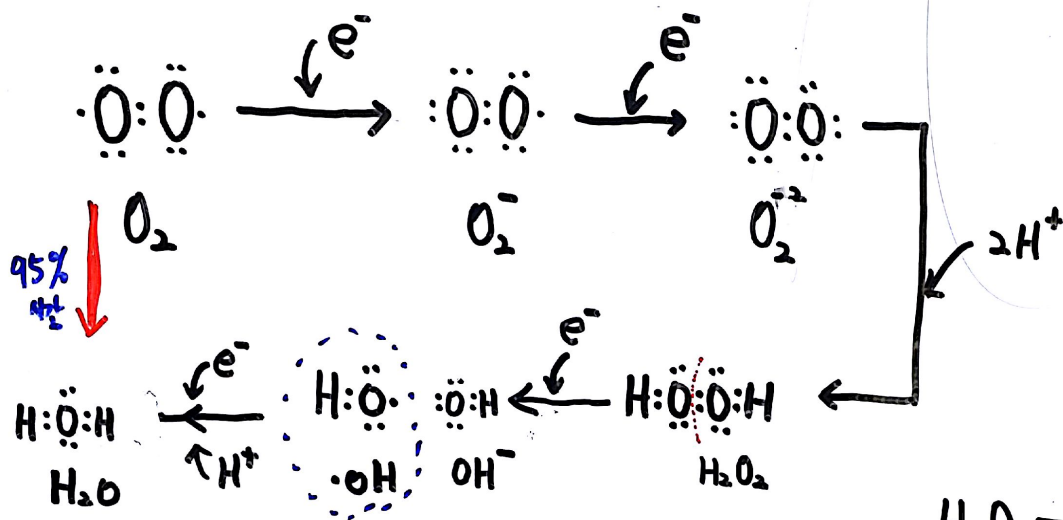
peroxydase $M = Mn, X = O$



hydrogenase $M = Co, X = H \quad H^+ \rightarrow H_2$



OH
hydroxy radical



NAD

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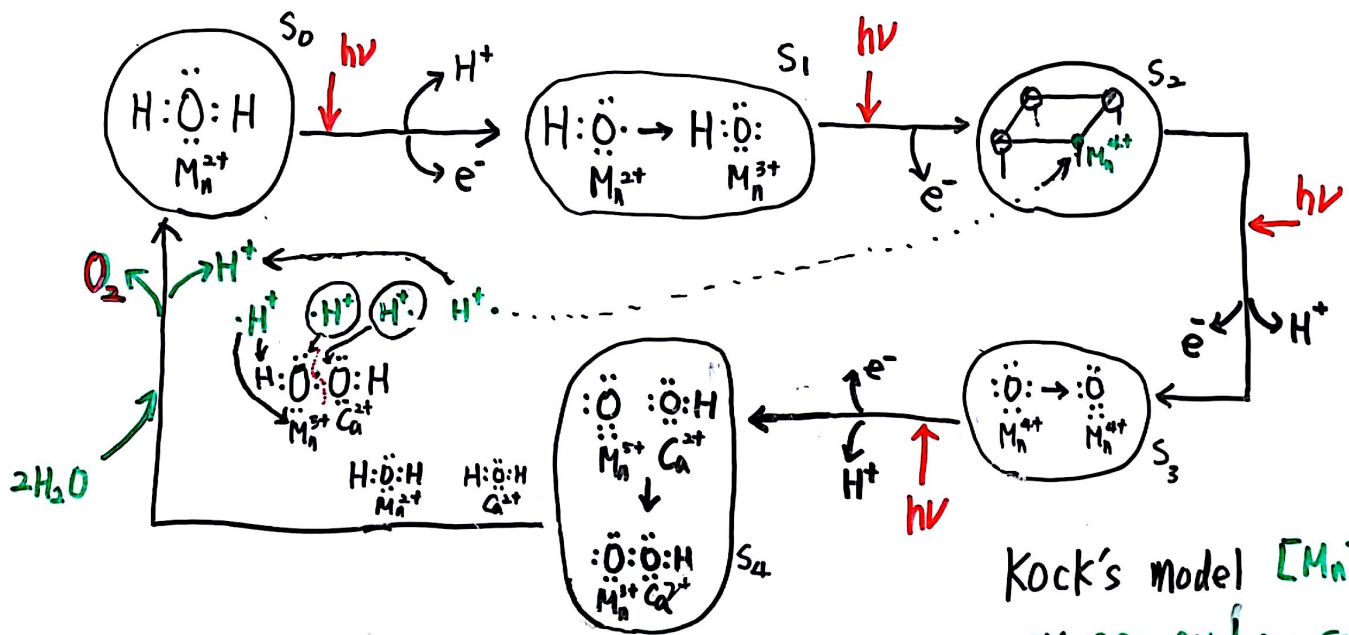
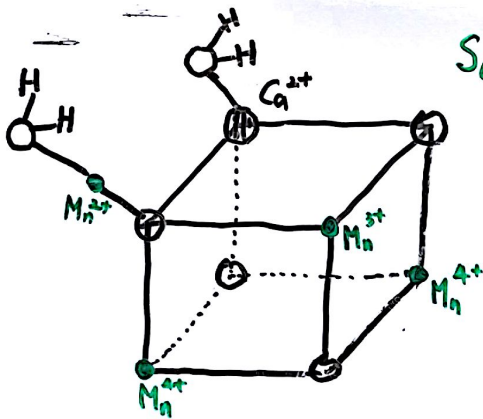
\downarrow \downarrow \downarrow

600 nm 560 nm 550 nm

Cyt = cytochrome

세포 색갈

1931 노벨



Kock's model [Mn]₄
 oxygen evolving complex OEC
 → Catalase

