

Harper - 10th ed

NADPH oxidase / Myeloperoxidase /

* Respiratory burst in neutrophils / Related disorder

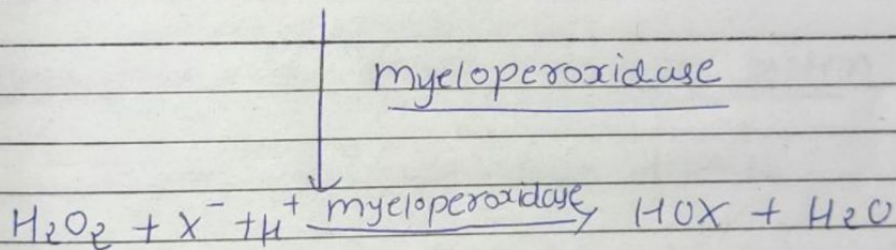
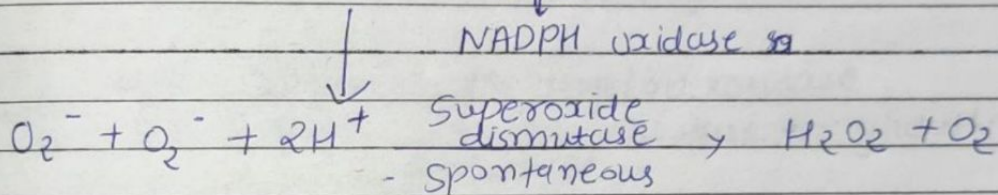
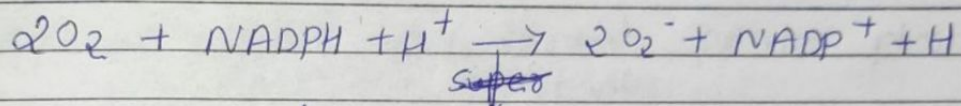
→ Respiratory burst

In neutrophils/ phagocytes

↓
ROS like O_2^- , H_2O_2 , OH^\cdot & $HOCl$ takes place after internalization of encapsulated cell with O_2 & electron from NADPH.

↓
Surge in oxygen consumption called respiratory burst.

→ Formation of ROS in neutrophils:-



[$X^- \rightarrow Cl^-, Br^-, I^-, SCN^-$]
HOX - hypohalous acid

→ Myeloperoxidase role:-

- Catalyzes production of chlorinated oxidants
- $HOCl$ (Hypochlorous acid) - Highly oxidative (highly microbicidal)
- $HOCl$ react with primary or secondary amine present & produce nitrogen-chlorine derivative
 ↓
 less oxidative → act as microbicidal without damaging surrounding tissues

→ NADPH oxidase system :-

↓
Cytochrome b558 - plasma membrane associated heterodimer
+
② Cytoplasmic polypeptide

→ Normally inactive
→ upon activation

↓
Cytoplasmic peptides recruited to plasma membrane & associate with cytochrome b558 & form active complex.

→ In respiratory burst

During phagocytosis flux through pentose phosphate cycle increases markedly

→ H₂O₂ → Substrate for myeloperoxidase
↳ Disposed of by catalase or glutathione peroxidase.

→ Mutation of NADPH oxidase system

↓
Chronic granulomatous disease

↓
Granulomas in skin, lungs & lymph node
↳ Nodular area of inflammation

→ Myeloperoxidase

- Responsible for green color of pus
- Genetic deficiency cause recurrent infections.