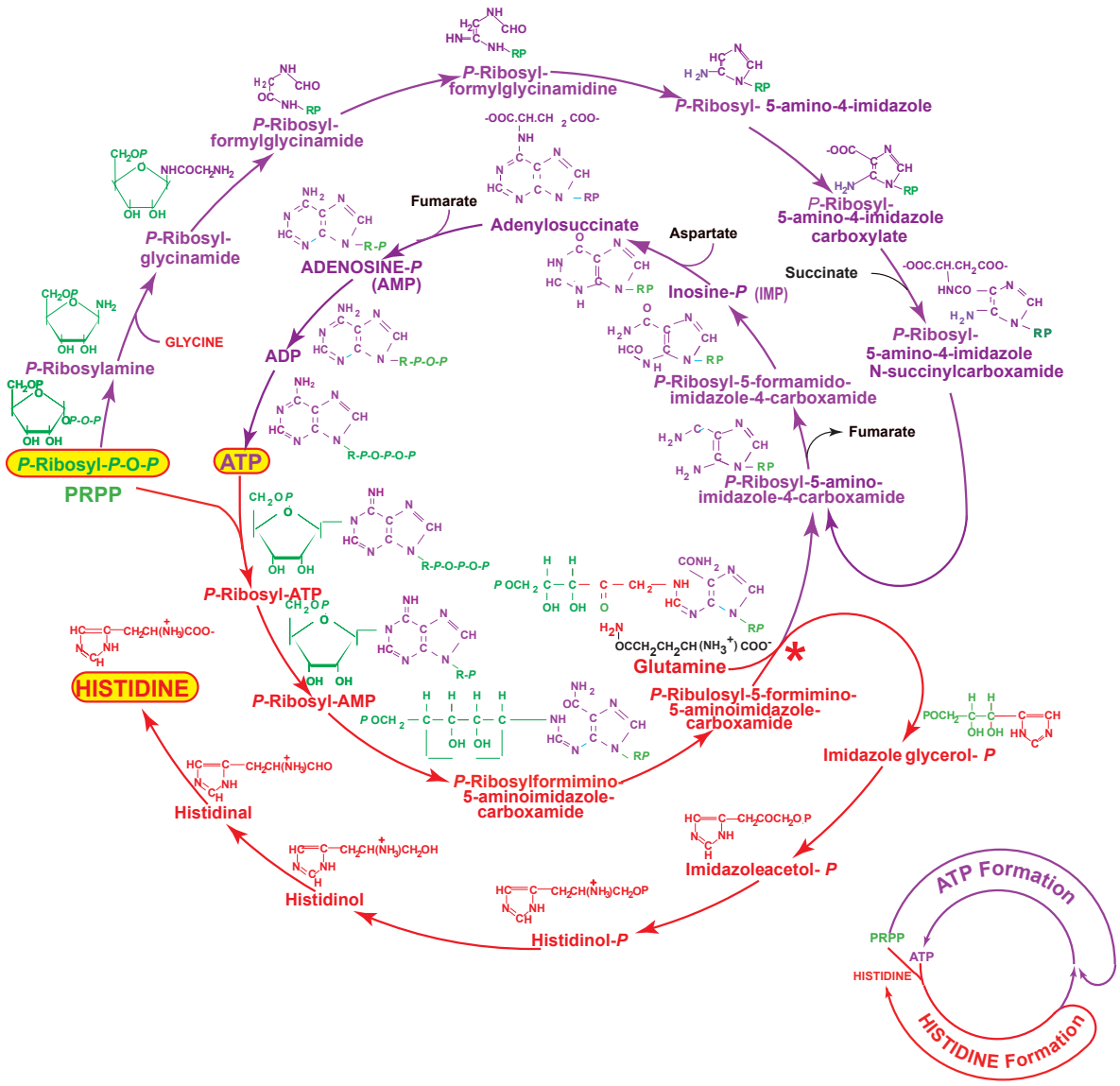
ATP & HISTIDINE INTERRELATIONSHIPS

A CLUE TO PRE-HISTORIC "BIO"- CHEMISTRY ?



Histidine and purines have a unique and fascinating interrelationship. They both originate from the same compound - PRPP. Both are characterised by the heterocyclic imidazole group. ATP is involved in the synthesis of histidine, not as a source of energy but as a supplier of one each of its carbon and nitrogen atoms. One of the intermediary reactions (*) involves the splitting of the molecule into TWO imidazole fragments, one of which becomes the basis of the histidine molecule while the other leads to the re-formation of the ATP - an ATP Cycle ! Since this ATP feeds into a cycle, *de novo* ATP must be derived fron PRPP in the usual way shown in the top (Purple) pathway.

The imidazole component of the histidine molecule is often a major influence in the active site of an enzyme. Could the imidazole component of purines have a similar activity? Some RNAs (Ribozymes) are known to be catalytic. Is this a clue to a pre-historic "RNA World" responsible for catalysis before the evolution of the "Protein World" ?