

Amino acid metabolism as target for Filarial drugs

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Filarial infections represent a continuum of diseases and are responsible for substantial morbidity in human and minimal populations. Manifestations may range from transient fever or mild itching to extensive and virtually immobilizing edema of limbs, skin atrophy, and blindness. Currently available drugs, such as diethylcarbamazine and ivermectin, are active mainly against circulating microfilariae. The main problem regarding the chemotherapy of filariasis is that no safe and consistent chemotherapeutic agent is available yet to combat the adult human filarial worms. One of the main reasons is the prolonged existence, i.e. survival of filarial worms in mammalian hosts for many years, and having a very strong antioxidant system. Glutathione (GSH) has been identified as an important part of the antioxidant system of many, if not all, living cells and, together with glutathione reductase (GR), it maintains the correct intracellular redox balance. It protects the cell against oxidative damage by nonenzymatic scavenging of free radicals and by enzymatic neutralization of toxic hydrogen peroxide, lipid hydroperoxides, and derivatives by glutathione-dependent peroxidases (GPXs) and glutathione-S-transferases (GSTs).

Work in this direction reveals that filarial worms can synthesize and recycle GSH, and its depletion may be useful in chemotherapeutic situations in which the cells to be killed and the cells to be spared have substantially different quantitative requirements for GSH. All normal mammalian cells have a considerable amount of GSH, whereas filarial worms may have GSH concentrations close to that required for their survival and, therefore, a little manipulation of the glutathione metabolism of filarial worms may have drastic consequences. The present review details the application of the glutathione metabolism of filarial worms as a target for the design and synthesis of new antifilarial agents.

Biography

Manisha Mishra has completed his Ph.D at the age of 29 years from Banaras Hindu University and postdoctoral studies from Institute of Medical Sciences, Banaras Hindu University, Varanasi. She is Post Graduate Teacher (Biology) in Central Hindu Girl's School, (Kamachha), B.H.U., Varanasi. She has published more than 25 papers in reputed journals with high impact factor and serving as an editorial board member of reputed, i.e., International Journal of Pharma & Biosciences.

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