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## Drug discovery against category A-C pathogens through MEP pathway

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The World Health Organization estimates that around 1.5 billion people are currently infected with latent tuberculosis (TB). Each year, 8 million people develop active disease and of these approximately 20% of the cases are multiple drug resistant and 2% are extensively drug resistant. In all, the annual death toll from TB is 2-3 million people worldwide. However, in spite of recent intensive research no new classes and delivery methods of anti-TB drugs have been developed for clinical use since the 1960's. In this context, designing, developing and delivering a new drug is very important. To date two different biosynthetic pathways have been reported leading to isopentenyl diphosphate, the universal precursor of isoprenoids. The mevalonate pathway is found in animals whereas the methylerythritol phosphate (MEP) or non-mevalonate pathway is found in many bacteria, some protozoa and plants. Since the MEP pathway is not found in mammalian cells, it is considered an attractive target for the development of antimicrobials, antimalarials and herbicidal agents; a hypothesis that is being explored by raising number of researchers recently. In recent years, we reported enantioselective synthesis of DXS, MEP, CDPME, CDPME2P and MECPP, the substrates for assay development. In addition the kinetic studies of mycobacterial DXS, IspC, IspD, IspE, and IspF were also reported while developing assay. Computational screening against 14 million compounds gave us a good drug lead. With the newly synthesized MEP, CDPME substrate and developed assay a new IspD and IspE inhibitor were discovered showing good  $IC_{50}$  and MIC.

### Biography

Prabakaran Narayanasamy is a faculty member in the Department of Pharmacology and Experimental Neurosciences at the University of Nebraska Medical Center. He received his PhD at IIT in Organic Chemistry and did his postdoctoral studies at North Dakota State University, Harvard University and University of Illinois Urbana-champaign. Later, he joined as a Research Scientist at Colorado State University to explore drug discovery. He has been a faculty at University of Nebraska Medical Center since 2012. His research interests are on development, delivering and discovering drug for anti-mycobacterial medicine and antiretroviral therapy. He has funding from NIH and also reviewer for proposals.

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