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## Development of pantothenate synthetase inhibitors for mycobacterium tuberculosis infection: Design and enzyme inhibition studies

**Brindha Devi P, Mallika A, Yogeeswari P and Sriram D**
Medicinal Chemistry & Tuberculosis Research Laboratory, Department of Pharmacy, BITS-Pilani, India

Pantothenate synthetase (PS) encoded by panC gene from Mycobacterium tuberculosis a potential target for antituberculosis drugs. PS catalyzes the ATP-dependent condensation of pantoate and ß-alanine to form patothenate in bacteria, yeast and plants. This PS is absent in mammals and both CoA and Acyl carrier protein are essential cofactors for bacterial growth, and hence PS is an attractive chemotherapeutic agent for tuberculosis treatment. The crystal structure of PS were determined from M.tuberculosis and its complexes with AMPCPP, pantoate and pantoyl adenylate. A novel potent PS inhibitors were developed and screened against PS for inhibitory activity. The activity of PS was measured spectrophotometrically through an enzymatic cascade involving myokinase, pyruvate kinase, and lactate dehydrogenase. The rate of PS ATP utilization was quantitated by the reduction of absorbance due to the oxidation of NADH to NAD+ by lactate dehydrogenase, which allowed for an internal control to detect interference from compounds that absorb at 340 nm. This coupled enzymatic reaction was used to screen 100 compounds in a 96-well format. One hundred inhibitory molecules were computationally analyzed using Glide docking, and the inhibitors possessed better binding affinities against the PS enzyme. The in vitro validation of these inhibitors has proved its efficacy as a better target for TB.

### Biography

Brindha Devi P has completed his PhD from Andhra University and pursuing research for Ph.D. in the Department of Pharmacy, Birla Institute of Technology & Science, Pilani, Hyderabad Campus.

pbrindhadevi@gmail.com

## Studies on the production of glutamic acid by Brevibacterium immario philium under solid state fermentation of citrus pulp

**ChV Satya, N. M Yugandhar and D. Sri Rami Reddy**
Centre for Biotechnology, Department of Chemical Engineering, Andhra University, India

L-Glutamic acid was a widespread amino acid present in food stuffs as the free and protein bound form. Foods containing large amounts of free glutamic acid (tomatoes, mushrooms and cheese) are traditionally used to obtain savory dishes. Only the free form of glutamic in its L-configuration presents flavor enhancing properties and for this reason, it was widely used as a flavor enhancer in the food industry, particularly in the form of the monosodium salt. Even though there was no complete agreement about the safety of Monosodium Glutamate, Food and Drug Administration (FDA) includes it among the substances generally recognized as safe(GRAS).

The solid state fermentation (SSF) has number of advantages over submerged fermentation (SMF) like non aseptic conditions, use of raw materials as substrates, use of a wide variety of matrices, low capital cost, low energy expenditure, less expensive downstream processing and it also requires less solvent and lower recovery cost than SMF. SSF has been gaining more and more attention in recent years due to the possibility of cheap and abundant agro industrial waste as substrate. Economic analysis has indicated that SSF technology can considerably reduce the capital investment and total product cost and increase profitability thereby making it an ideal technology in several industrial sectors.

In the present study several agro industrial residues such as black gram husk, rice bran, green gram husk, wheat bran, corn hull, citrus peel and citrus pulp were tested for their potential in the production of L-glutamic acid by eight microorganisms which include Corynebacterium glutamicum, Micrococcus glutamicus, Rhodococcus Sp, Bacillus circulans, Brevibacterium divaricatum, Brevibacterium saccharolyticum, Brevibacterium roscum, and Brevibacterium immario philium.

All the substrates supported the growth and L-Glutamic acid formation by the above eight microorganisms. A high titre of L-Glutamic acid yield (65.1mg/gds) was obtained with citrus pulp by Brevibacterium immario philium.

The maximum L-glutamic acid 245.6µg/gds was achieved with incubation time 96h, temperature 28°C, inoculum level 30% (v/w), salt solution 2.0(v/w), substrate particle size 850µm, pH 7.5 and initial moisture content 60%(v/w).