



Technology	Lead Inventor	Vaccine	Therapeutic	Diagnostic	Reagent	Utility	Description
Method for Early Detection of TB	John T. Belisle, Ph.D.			•			Protein and glycoprotein antigens have shown reactivity in TB infected individuals prior to symptoms demonstrating advanced infection.
Mid-Life TB Boosting Vaccine	Ian M. Orme Ph.D.	•					A purified mycobacterial protein when given to mice previously vaccinated with BCG boosted the resistance to aerosol TB challenge. This technology shows promise as a boost for BCG vaccinations.
Gram-Positive Antibacterial	Dean C. Crick, Ph.D.		•				Lead compounds have been discovered that demonstrate activity at low MIC in multiple drug-resistant bacterial species (including tuberculosis and staph infections).
Serodiagnostic TB Antigens	John T. Belisle, Ph.D.			•			Mycobacterium proteins have been identified as candidates to produce a rapid serodiagnostic for early detection of TB.
Vaccine Antigens for TB	John T. Belisle, Ph.D.	•					Fusion proteins were created that show efficacy as a vaccine in murine models.
Lipoproteins as Therapeutics and Adjuvants for TB	Randall J. Basaraba, PH.D.	•	•				Proteins that modulate hypoxia inducible factor 1 (HIF-1 $\alpha$ ) have potential application to treat latent and active TB infections. Additional uses as a vaccine adjuvant.
Improved Capuramycin Synthesis	Michio Kurosu, Ph.D.					•	Researchers at CSU have significantly improved the synthesis of Capuramycin.



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Inhibitors of TB Cell Wall Structural Enzymes	Michael R. McNeil, Ph.D.		•				Lead compounds have been elucidated to inhibit an enzyme used in the formation of linker molecules that are essential to bacterial cell wall structural. Testing has demonstrated robust inhibition of the enzyme in vitro.
Alternative Treatments for Chronic TB	Randall J. Basaraba, Ph.D.		•				A rationale for the treatment of chronic TB based on non-immunological factors. Specifics of the treatment are under development.
Substituted Ureas as Novel TB Drugs	Michael R. McNeil, Ph.D.		•				Newly elucidated TB drugs based on a substituted urea. Lead compounds are being developed.
Latent TB Diagnostic and Vaccine	Ian M. Orme Ph.D.	•		•			Recombinant proteins constructed with strong ELISA reactions to sera from children with latent TB infections. Potential future as a vaccine.
Sulfonamide Derivatives as TB treatments	Prabakaran Narayanasamy, Ph.D.		•				New compounds were synthesized and purified that act on Menaquinone A, a bacterial synthesis pathway not present in mammals.
Post-Exposure TB Vaccine	Ian M. Orme Ph.D.	•					A series of proteins that reduce bacterial load and lung pathology in guinea pigs, when administered 30-60 days after exposure to TB.
Diagnostic Skin Test for TB and Leprosy	Karen Dobos-Elder, Ph.D.			•			Heat shock proteins that enhance antigen presentation and stimulate innate immune responses can be used in an assay utilizing newly isolated purified mycobacterial proteins.



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Biomarkers to Assess Early Treatment of TB	John T. Belisle, Ph.D.			•		•	Biomarkers from urine and sputum of TB infected individuals. These markers change in relative abundance throughout the course of treatment and could be used to assess treatment efficacy.
RNAi Therapeutic for Chronic Bacterial Lung Infection	Mercedes Gonzalez-Jaurero, Ph.D.		•				Intrapulmonary delivery of an siRNA to a host protein has demonstrated a reduction in bacillary load in chronically infected mice.
Guinea Pig Biomarkers to Predict Vaccine Efficacy	Diane Ordway-Rodriguez, Ph.D.			•		•	The guinea pig is the preferred animal model for TB research. Biomarkers have been identified that can predict the reactivation of a latent infection. These markers could be used to prevent reactivation and reduce drug resistance.
Inhibitors of Gram-Positive Metabolism	Prabakaran Narayanasamy, Ph.D.		•				New compounds have been created that inhibit the Menaquinone A metabolic pathway. Primary experiments have shown success in TB, but the target is ubiquitous in gram positive bacteria.