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Diagnosis of active TB using aptamers

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Abstract

A lack of simple, rapid, accurate, and affordable point-of-care diagnostic tools tailored to detect active TB early enough for opportune intervention in high HIV and TB prevalence developing countries is one of defining public health problems of our generation. Therefore, to help address this problem of unmet TB diagnostic needs in developing countries; we isolated sensitive and specific classes of novel artificial nucleic acid molecules called aptamers against the 10-kDa culture filtrate protein (CFP-10) and the 6-kDa early secreted antigen target (ESAT-6), which are potent T-cell antigens that are recognised by over 70% of TB patients. We then used these aptamers to develop a TB diagnostic tool that can be used at point-of-care for early and rapid detection of the disease. We have shown in a proof-of-concept case-controlled study that the aptamer-based diagnostic tool was able to accurately detect all cases of active TB from sputum samples of patients, including smear-negative culture positive and samples from patients co-infected with HIV.

Biography

Makobetsa Khati holds several degrees including a Masters in Molecular Medicine from the Imperial College School of Medicine at the Hammersmith Hospital in London; a Masters in Public Health from the School of Public Health and Family Medicine, University of Cape Town; and a Doctorate in Molecular Pathology from the Sir William Dunn School of Pathology, University of Oxford. Makobetsa is currently Head of the Emerging Health Technologies Department at the CSIR. He is also an Honorary Associate in the Department of Medicine at Groote Schuur Hospital and the University of Cape Town.