In vivo microevolution of *Mycobacterium tuberculosis* and transient emergence of *atpE*_Ala63Pro mutation during treatment in a pre-XDR TB patient

Arash Ghodousi[1,2], Alamdar Hussain Rizvi[3], Faisal Masood Khanzada[3], Nasim Akhtar[4,5], Abdul Ghafoor[4], Alberto Trovato[2], Daniela Maria Cirillo[1,2] and Sabira Tahseen[3]

[1]Vita-Salute San Raffaele University, Milan, Italy. [2]IRCCS San Raffaele Scientific Institute, Milan, Italy. [3]National TB Reference Laboratory, National Tuberculosis Control Program, Islamabad, Pakistan. [4]National Tuberculosis Control Program, Islamabad, Pakistan. [5]Pakistan Institute of Medical sciences, Islamabad, Pakistan.

Corresponding author: Sabira Tahseen (sabira.tahseen@gmail.com)

Cite this article as: Ghodousi A, Hussain Rizvi A, Khanzada FM, *et al*. *In vivo* microevolution of *Mycobacterium tuberculosis* and transient emergence of *atpE*_Ala63Pro mutation during treatment in a pre-XDR TB patient. *Eur Respir J* 2022; 59: 2102102 [DOI: 10.1183/13993003.02102-2021].

This article has an editorial commentary: https://doi.org/10.1183/13993003.00149-2022

Received: 28 July 2021
Accepted: 4 Nov 2021

To the Editor:

Bedaquiline is a novel anti-tuberculosis drug for the treatment of multidrug-resistant tuberculosis (MDR-TB) recommended by the World Health Organization (WHO) [1] and recently upgraded to the group A classification of TB drugs as one of the three key drugs, along with linezolid and fluoroquinolones, to be included in all MDR-TB treatment regimens. Based on this grouping of second-line drugs, extensively drug-resistant tuberculosis (XDR-TB) is redefined as MDR- or rifampicin-resistant-TB that is resistant to a fluoroquinolone and to either bedaquiline or linezolid or both. Moreover, bedaquiline, in combination with pretomanid and linezolid, is a part of BPaL regimen recommended for treating adult pulmonary TB patients having pre-XDR-TB or MDR-TB which is either non-responsive or intolerant to recommended standard treatment [2]. However, globally emerging resistance to bedaquiline threatens the effectiveness of novel treatment regimens for drug-resistant TB.