Tuberculosis — drugs in the 2016 development pipeline

Barbara E. Laughon and Carol A. Nacy

In their recent Primer article (*Tuberculosis*, *Nat. Rev. Dis. Primers* 2, 16076 (2016))¹, Madhukar Pai and colleagues give an important and comprehensive update on the advances made in epidemiology, diagnosis, prevention and treatment for combatting the global tuberculosis (TB) epidemic. The Primer included the global TB drug pipeline (Figure 5) that represented the status of the field as of April 2016. However, several important new developments were reported at two major scientific conferences later in 2016: the EMBO Conference Tuberculosis 2016 in Paris, France, 19–23 September 2016 (<http://www.tuberculosis2016.org/>), and the 47th Union World Congress on Lung Health and associated meetings in Liverpool, UK, 26–29 October 2016 (<http://liverpool.worldlunghealth.org/>). We believe that updates to the 2016 status of the TB drug pipeline would be of interest to readers of the journal.

Among these updates is the novel cyclopeptide SATB-082, a preclinical development candidate by Sanofi and the TB Alliance²; the macrolide SEQ-9 has been deprioritized by the same group. Nearmedic Plus announced results from phase I testing of the

benzothiazinone PBTZ-169 (REF. 3) and has initiated a phase II early bactericidal activity study in Russia. Otsuka Pharmaceutical announced that its novel carbostyryl compound OPC-167832 has entered phase I clinical safety testing⁴. Sequella, Inc. reports completion of a phase II/III trial of SQ109 by their partner Infectex in Russia^{5,6} and maintains SQ109 as an active candidate in the phase II stage in the United States^{5,7,8}. A new oxazolidinone, LCB01-0371, is being developed by LegoChem Biosciences in South Korea and is in phase II testing⁹.

Despite these advances, many more TB drug candidates are needed to sustain an effective and productive drug pipeline. Given the known attrition rate of new chemical entities, a robust number of candidates will be needed to achieve the goals of shortening current treatment and effectively dealing with the increasing level of drug resistance worldwide.

As referenced in the Primer, the STOP TB Partnership's Working Group on New Drugs maintains an active inventory of new molecular entities in development, as well as a listing of ongoing clinical trials of new drug regimens for the treatment of TB. The website is www.newtbdrugs.org/.

Barbara E. Laughon is with the STOP TB Partnership's Working Group on New TB Drugs, 24th Floor, 40 Wall Street, New York, New York 10005, USA.

Carol A. Nacy is at Sequella, Inc., Suite 200, 9610 Medical Center Drive, Rockville, Maryland 20850, USA.

Correspondence to B.E.L.
blaughon@gmail.com

Article number: 17015
[doi:10.1038/nrdp.2017.15](https://doi.org/10.1038/nrdp.2017.15)
Published online 9 Mar 2017

1. Pai, M. *et al.* Tuberculosis. *Nat. Rev. Dis. Primers* 2, 16076 (2016).
2. Kling, A. *et al.* Antibiotics. Targeting DnaN for tuberculosis therapy using novel griselimycins. *Science* 348, 1106–1112 (2015).
3. Makarov, V. & Cole, S. First clinical trial with the novel drug candidate PBTZ169: expected results and surprises [abstract 56]. *Tuberculosis2016.org* <http://www.tuberculosis2016.org/images/Public/Maquette-27sep2016.pdf> (2016).
4. [No authors listed.] New TB compound to be developed for Pan-TB regimen. *StopTB* http://www.stoptb.org/news/frompartners/2016/fp16_094.asp (2016).
5. Phipps, A. Sutezolid and SQ-109 update. Talk presented at the Clinical Path to TB Drug Regimens (CPTDR) Workshop, May 2016 <https://www.youtube.com/watch?v=94I6qForpHl&feature=youtu.be> (2016).
6. Skorniyakov, S. N. *et al.* Effectiveness and safety of a chemotherapy regimen that includes SQ109 in pulmonary tuberculosis patients with MDR-TB. Talk presented at the National Scientific and Practical Conference of Phthisiologists, Moscow <http://roftb.ru/conf/russian> (2016).
7. Boeree, M. J. *et al.* High-dose rifampicin, moxifloxacin, and SQ109 for treating tuberculosis: a multi-arm, multi-stage randomized controlled trial. *Lancet Infect. Dis.* 17, 39–49 (2016).
8. Ruslami, R. & Menzies, D. Finding the right dose of rifampicin, and the right dose of optimism. *Lancet Infect. Dis.* 17, 2–3 (2016).
9. US National Library of Medicine. *ClinicalTrials.gov* <https://clinicaltrials.gov/show/NCT02836483> (2016).

Competing interests

C.A.N. is the Founder and CEO of Sequella, Inc., which is the commercial developer of sutezolid and SQ109. B.E.L. declares no competing interests.