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REPLY

# Rational antibiotic sustainability for transrectal prostate biopsy prophylaxis

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With regard to our article (Prophylactic antibiotic for prostate biopsy: the carbapenem gamble. *Nat. Rev. Urol.* **14**, 394–396 (2017))[1], we thank Maxim Bloomfield and Timothy Blackmore for their correspondence (Prophylactic ciprofloxacin for prostate biopsy: a losing bet? *Nat. Rev. Urol.* http://dx.doi.org/10.1038.org/nrurol.2017.154 (2017))[2]. We applaud the work of Bloomfield and colleagues investigating the role of single-dose ertapenem prophylaxis in the development of selective carbapenem-resistant Enterobacteriaceae[3]; in fact, prospective studies in this domain are severely lacking.

Although the study was well executed, it is underpowered to detect changes in bacterial culture and clinical infection. It is well known that, despite fluoroquinolone-resistant faecal flora rates of ~20%, only a small percentage of men undergoing transrectal ultrasonography-guided prostate biopsy (TRUPB) develop clinical infection and an even smaller percentage of those develop sepsis[4,5]. Indeed, in a population-based study using data from the English cancer registry of 198,361 men who underwent TRUPB, only 1.1% of patients developed UTI/sepsis[6]. It is common knowledge that overuse of crucial antibiotics by overtreating the vast majority of patients with these agents would not be a sound long-term solution. Moreover, it has become clear that certain patients will develop infection because either they harbour more virulent bacteria or the patient's inherent resistance to infection is compromised. This notion is best exemplified in one large study that demonstrated that 88% of men who developed sepsis were treated with an antibiotic to which the sepsis-causing organisms were culture-proven sensitive[7].

We do not suggest that carbapenems pose a greater risk than fluoroquinolones in the development of carbapenem resistance. We are concerned because carbapenems are used for serious life-threatening bacterial infections, and widespread prophylactic use to prevent a sepsis rate of 1% seems to discount the importance of ertapenem antibiotics to the treatment armamentarium. The crux of the studies cited in the Correspondence by Bloomfield and Blackmore[2] clearly support our argument about the development of antibiotic resistance and the need for antibiotic stewardship[8–10]. They emphasize that previous antibiotic exposure increased the risk of carbapenem-resistant *Klebsiella pneumoniae*, and that treatment duration is an important driving factor of resistance development. Antibiotic resistance becomes inevitable the more the antibiotic is used. This has been the history of all frequently used antibiotics.

Other means of preventing sepsis exist, such as reducing microbial load with prebiopsy rectal enemas or avoiding the rectum with transperineal biopsy. Possibly more prudent measures include careful patient selection using optimized and well-validated prebiopsy tests, such as rectal culture, to guide the use of carbapenems in a selected group rather than broadly.

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**Competing interests statement**
The authors declare no competing interests.