

## **Additional file 2 — Empirical estimation of false positive rate**

For estimating the false positive rate of the BDS filled up with  $n$   $k$ -mers, we made the following experiment. We generated  $n+100000$  distinct random  $k$ -mers, used first for filling up the BDS with  $n$   $k$ -mers and then for querying the BDS with the 100000 remaining  $k$ -mers. All  $k$ -mers being distinct, if the BDS answers “yes” while querying the presence of a  $k$ -mer, it is a false positive.

The generation of a huge set of  $x$  distinct random  $k$ -mers (with  $x < 4^k$ ) is not trivial. This was done by dividing the space of  $4^k$   $k$ -mers into  $x$  non overlapping blocks, and then by picking up a random  $k$ -mer into each block. This method enables to uniformly cover the whole  $k$ -mer space.