

Single strand DNA aptamers that specifically bind tetracycline group of antibiotics

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Tetracycline group of antibiotics are widely used as human and veterinary medicine that are found accumulated in meat, milk, fish, chicken and eggs. These antibiotics exist as structural analogues of tetracycline that interconvert due to environmental perturbation, which makes their detection difficult. To overcome this problem, we have developed single strand DNA aptamers that specifically bind to analogs of tetracycline (tetracycline, oxytetracycline, and doxycycline) with high specificity. Seven aptamers have been selected that bind strongly to oxytetracycline (OTC), tetracycline (TET), and doxycycline (DOX). All seven aptamers showed binding affinity (K_d in the nanomolar range) with high specificity. The binding of aptamers to target followed the order of OTC > TET > DOX. The ability of the aptamers to bind more than one type of tetracycline antibiotics makes them group specific and serve as potential candidates for detection of tetracycline antibiotics that may exist in different forms in contaminated food products and drinking water.