Xylanases (endo-1,4-xylanase, EC 3.2.1.8) hydrolyze the β-1,4-glycosidic bonds between xylose residues in xylan, and have industrial applications in the depolymerization of hemicellulose. Xylanase A, a GH11 family xylanase from Bacillus subtilis (XynA), is inhibited by xylose in a typical product release regulation that decreases the biomass degradation capability of the enzyme. This work aims to create chimeric protein with a domain-domain interface that could upregulate xylanase activity upon binding D-xylose. We constructed a random domain insertion library, where the gene encoding xylanase (xynA) was randomly inserted into the gene encoding Escherichia coli xylose binding protein (XBP). Chimeric xynA-XBP proteins with positive allosteric xylanase activity were selected by screening almost ten thousand clones, and showed a 30-60% increase in xylanase activity in the presence of xylose. This strategy allows the creation of protein chimeras by in vitro recombination of nonhomologous genes, and enabled the engineering of an enzyme that is stimulated by its product, without alterations in the active site of the catalytic domain.