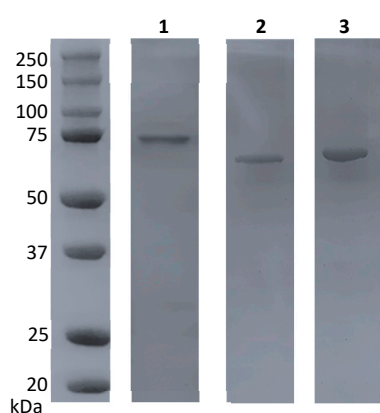


## Supplementary data



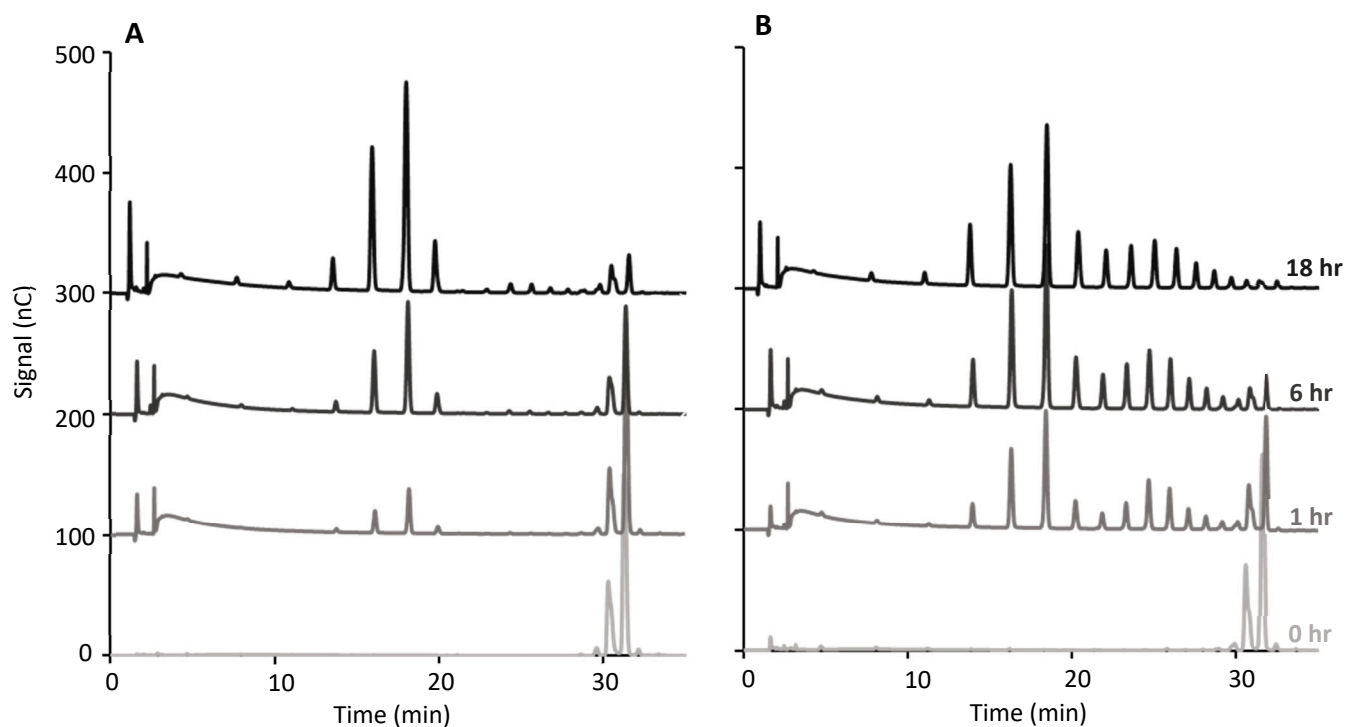
**Figure S1.** SDS-PAGE gel of purified TkGBE57 (*Thermococcus kodakarensis*; 79 kDa, lane 1), MsGBE57 (*Meiothermus sp.*, 56 kDa, lane 2) and TmGBE57 (*Thermotoga maritima*; 63 kDa, lane 3). Protein amount on gel is 1.25 µg.

**Table S1.** Activity of TmGBE57 (*Thermotoga maritima*), TkGBE57 (*Thermococcus kodakarensis*), MsGBE57 (*Meiothermus sp.*) & EcGBE13 (*Escherichia coli*) on amylose and a linear maltodextrin (MD18), analyzed with two different methods (iodine assay and reducing end assay).

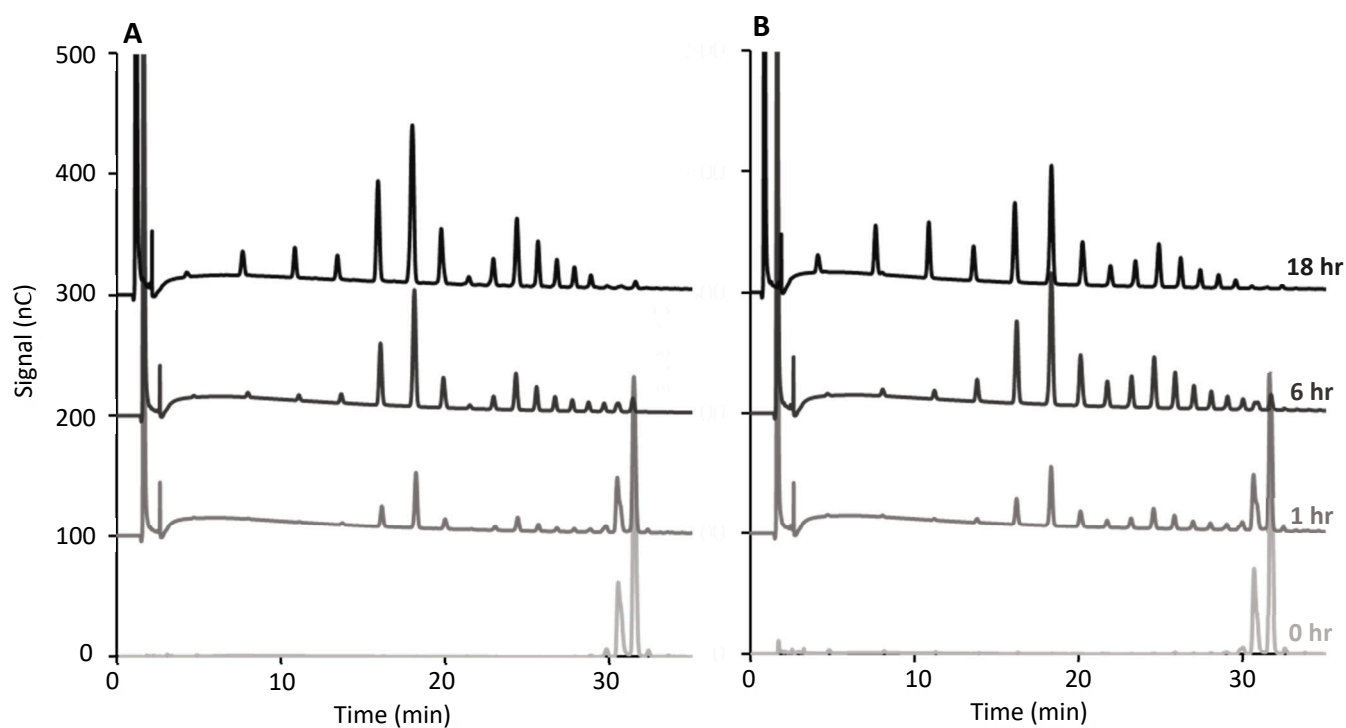
Method		A	B			C		
Substrate		Iodine assay	Reducing end assay			Reducing end assay		
		Amylose	Amylose			MD18		
		Total activity [mU/mg E]	Non-branching activity [mU <sup>NB</sup> /mg E]	Branching activity [mU <sup>B</sup> /mg E]	Ratio B:NB*	Non-branching activity [mU <sup>NB</sup> /mg E]	Branching activity [mU <sup>B</sup> /mg E]	Ratio B:NB*
Enzyme	TmGBE57	84.3 ± 1.0 <sup>#</sup>	2.0 ± 0.2	3.1 ± 0.3	1.5 ± 0.0	4.4 ± 1.0	5.0 ± 0.6	1.2 ± 0.2
	TkGBE57	440.7 ± 30.3	11.0 ± 0.5	44.9 ± 5.7	4.0 ± 0.3	13.0 ± 5.6	92.4 ± 9.5	8.1 ± 2.3
	MsGBE57	20.0 ± 0.7	1.0 ± 0.1	1.9 ± 0.2	2.0 ± 0.3	5.2 ± 0.3	5.6 ± 0.2	1.1 ± 0.0
	EcGBE13	100.5 ± 11.2	13.4 ± 8.6	133.1 ± 27.5	14.6 ± 7.3	120.1 ± 0.9	286.9 ± 42.5	2.4 ± 0.3

<sup>#</sup> average of three independent measurements with standard deviation

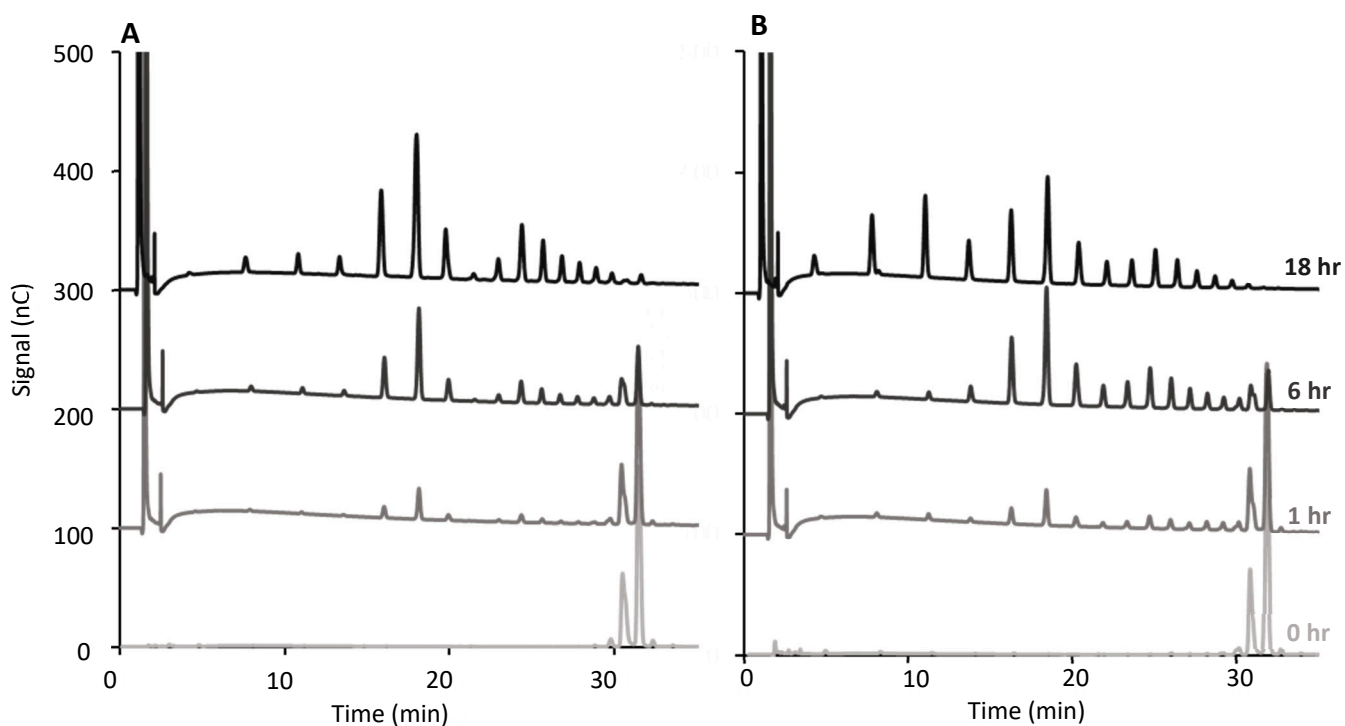
\*ratio branching activity to non-branching activity



**Figure S2.** Chain length distribution of MD18 modified with TkGBE57 (*Thermococcus kodakarensis*;  $1\text{U}^{\text{B}}/\text{g S}$ ) over time before [A] and after [B] debranching compared to the untreated substrate.



**Figure S3.** Chain length distribution of MD18 modified with TmGBE57 (*Thermotoga maritima*;  $1\text{U}^{\text{B}}/\text{g S}$ ) over time before [A] and after [B] debranching compared to the untreated substrate.



**Figure S4.** Chain length distribution of MD18 modified with MsGBE57 (*Meiothermus sp.*; 1U<sup>B</sup>/g S) over time before [A] and after [B] debranching compared to the untreated substrate.