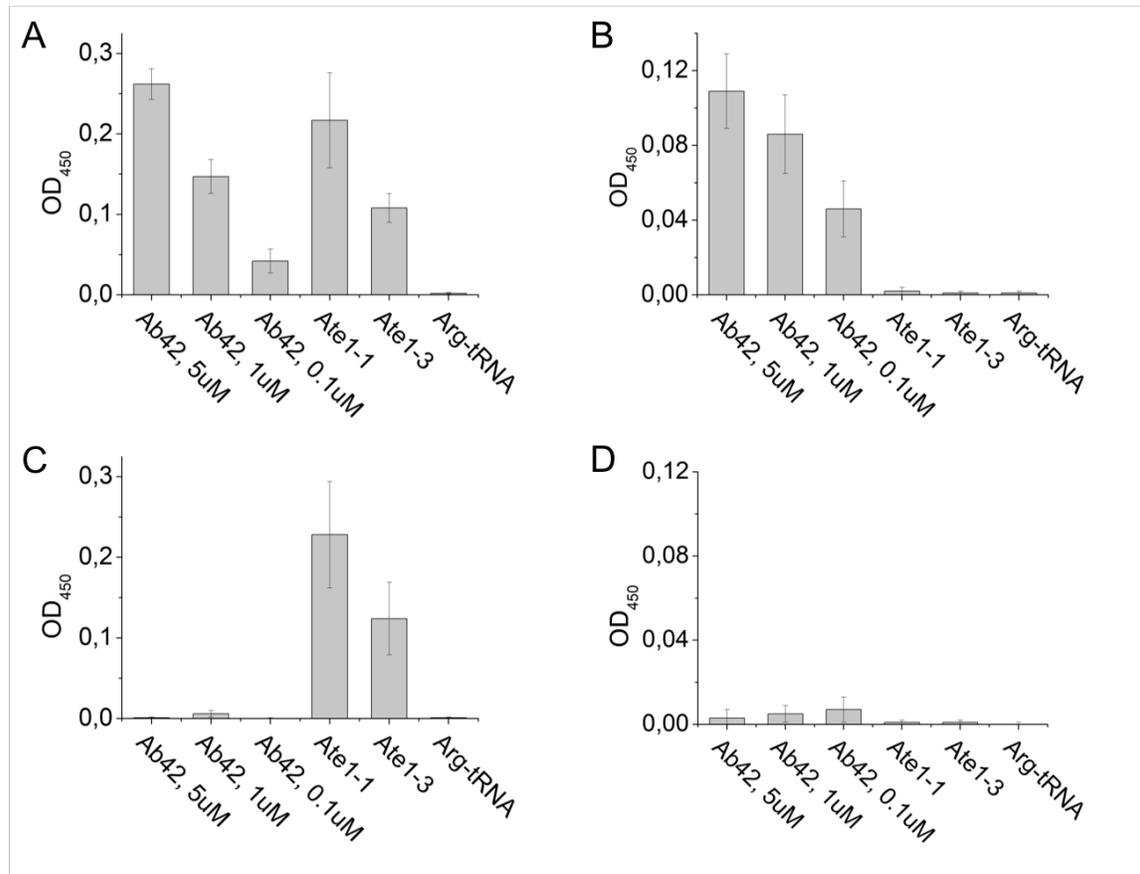
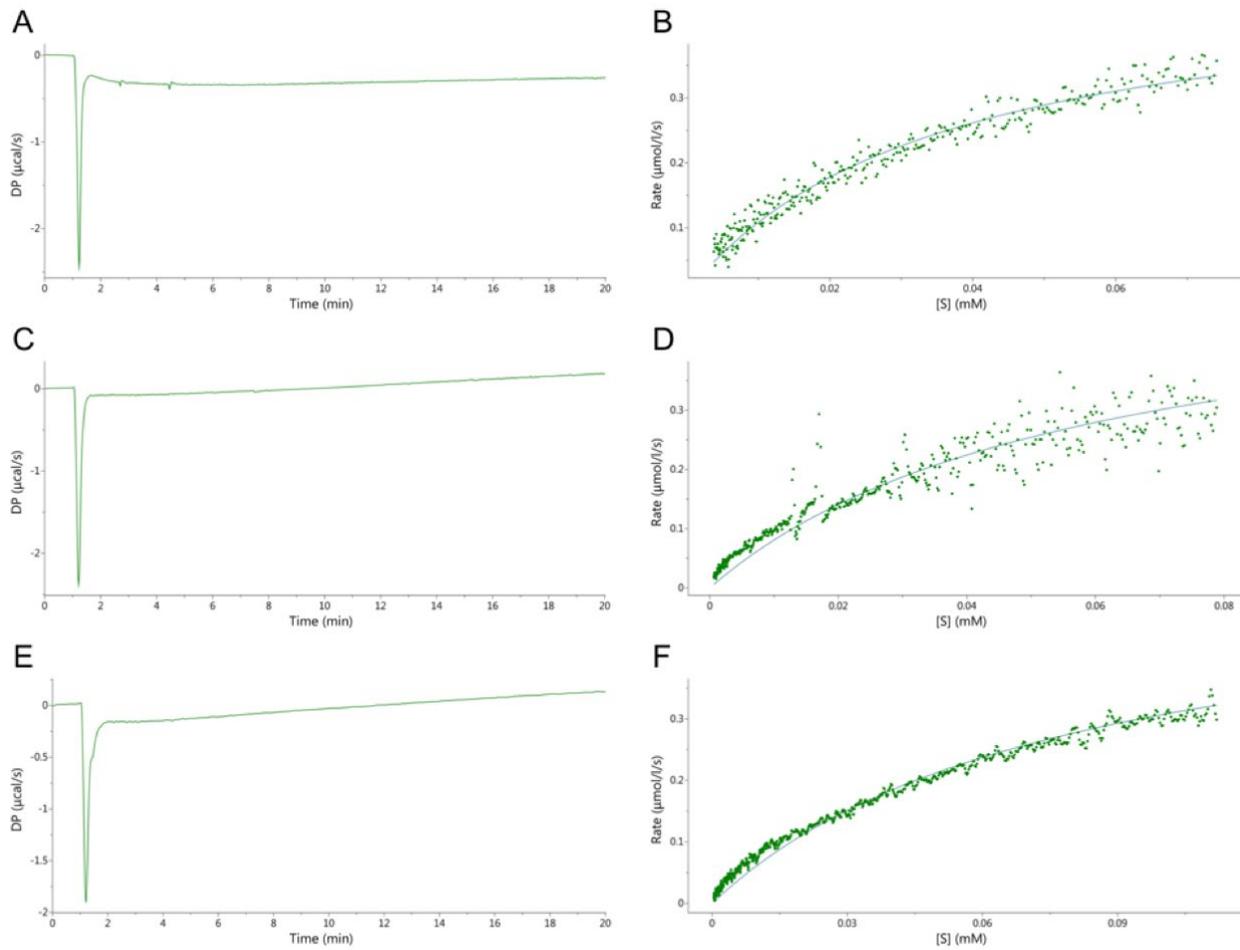


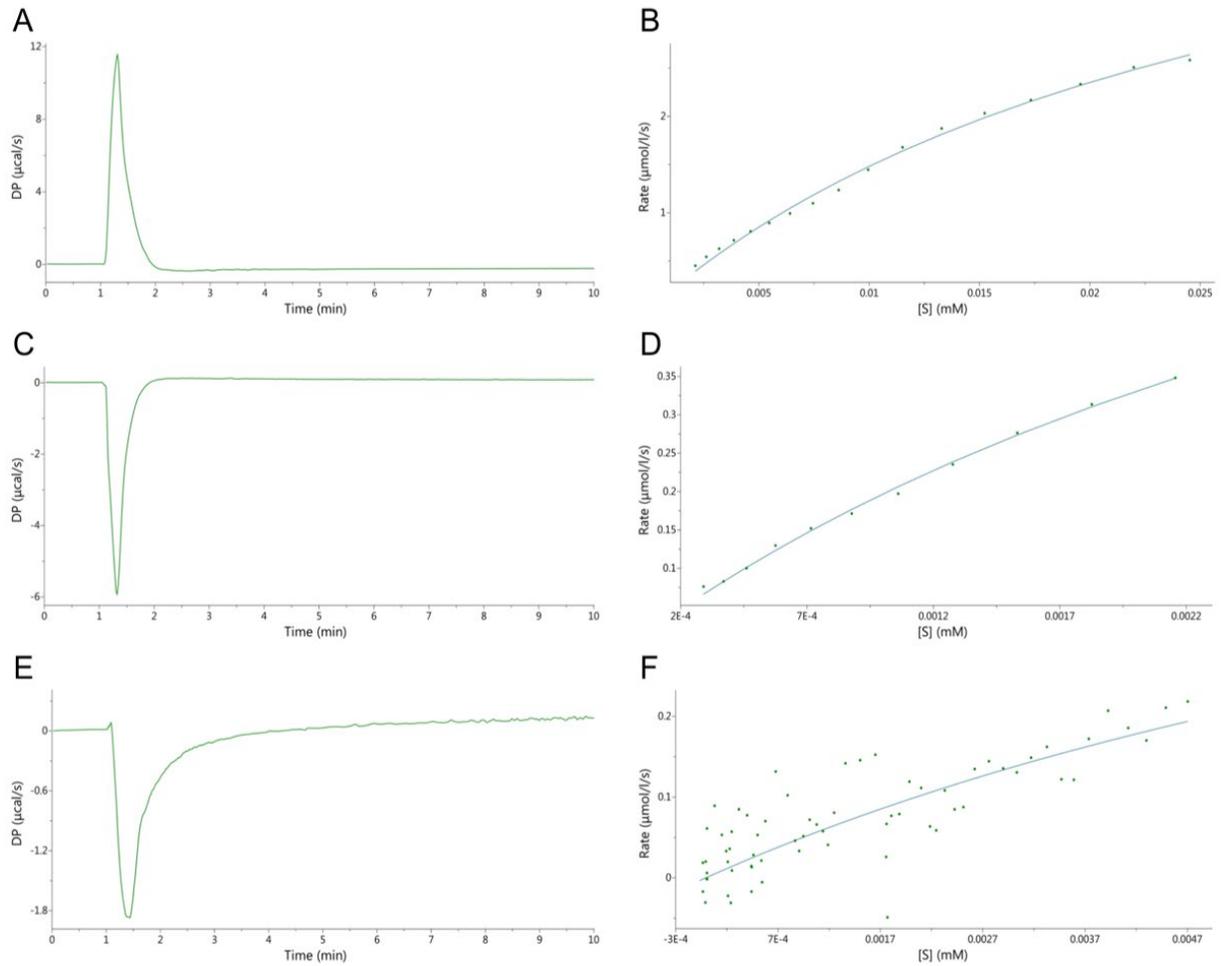
SUPPLEMENTARY FIGURES



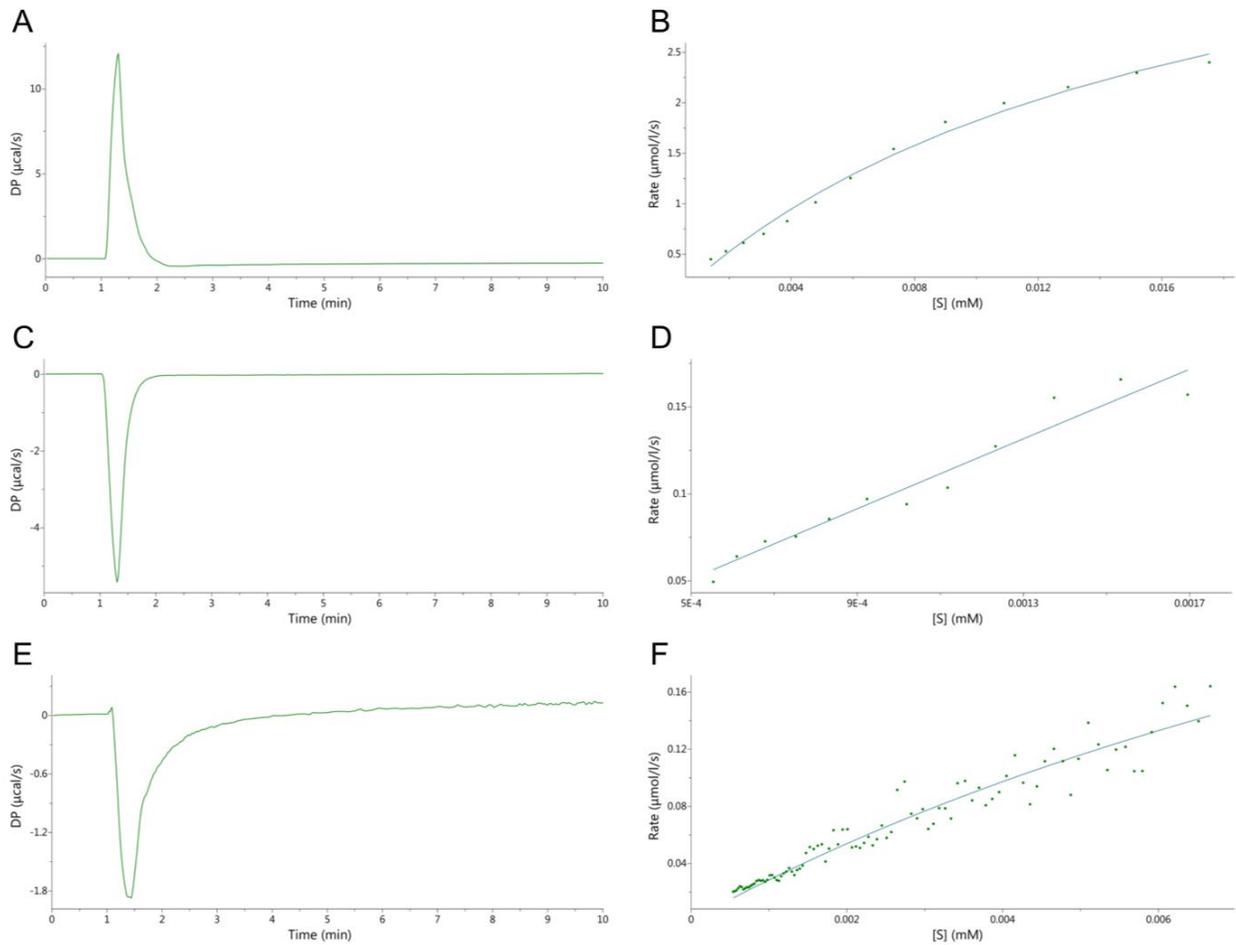
**Supplementary Figure 1.** Specificity of the anti-Aβ<sub>1-17</sub> (A), anti-Aβ<sub>36-42</sub> (B), anti-mouse (C) and anti-rabbit (D) antibodies to Aβ<sub>42</sub>, Ate1 isoforms and tRNA. Specificity of antibodies was probed using the indirect ELISA method. 96-well plate (Thermo Scientific Nunc MaxiSorp Surface) was coated overnight with 50 μl of Aβ<sub>42</sub>, 3 μM Ate1 or 15 μM tRNA followed by washing with phosphate-buffered saline containing 0.05% Tween (PBST) and incubation with 200 μl of blocking buffer for 2 h. 100 μl of antibodies diluted at the optimal concentration (Table 3) was added to each well and incubated for 2 h. For detection OPD (o-phenylenediamine dihydrochloride, Thermo Scientific) was used according to manufacturer’s instruction. OD<sub>450</sub> – optical density measured at 450 nm. Each value is the mean ± SD of at least three independent experiments.



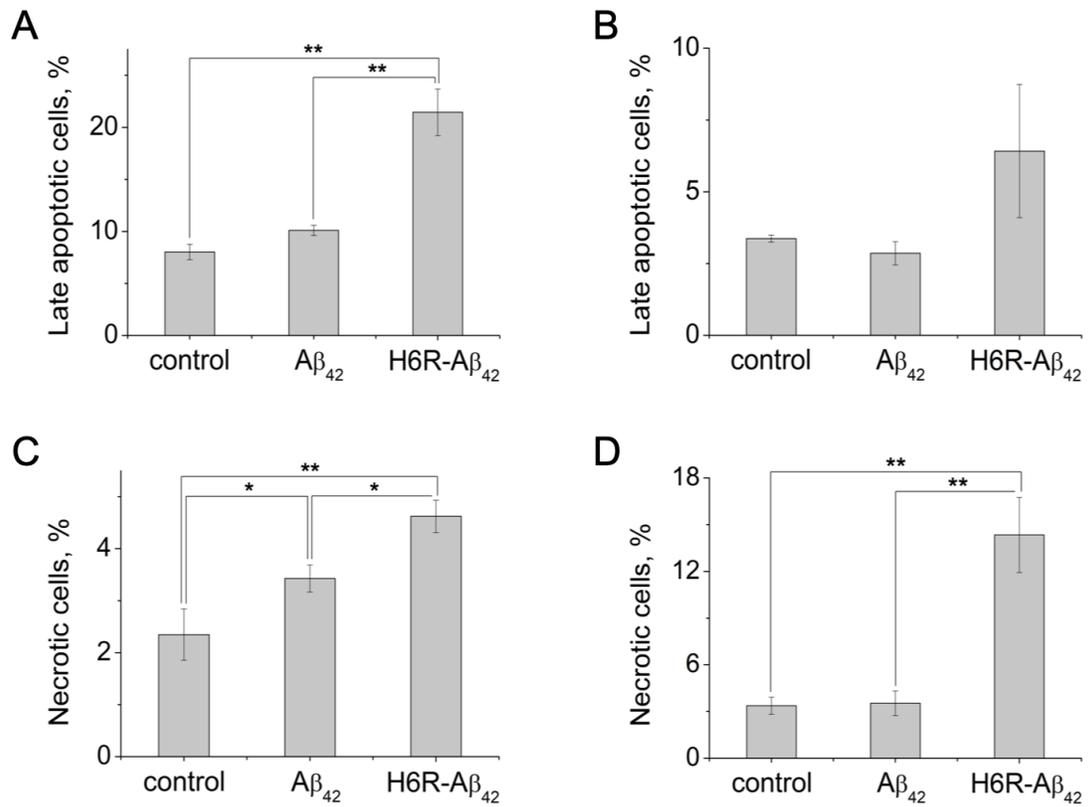
**Supplementary Figure 2. Effect of A $\beta$  on the ATP hydrolysis mediated by RS.** (A) Raw thermal power obtained in the single injection ITC assay by injecting ATP (to 200  $\mu$ M) into 1  $\mu$ M RS and 1 mM tRNA at 37°C. (B) To determine RS kinetic parameters thermal power was converted to enzyme turnover and fitted by non-linear least squares. (C) and (E) same as (A) but in the presence of A $\beta_{42}$  and H6R-A $\beta_{42}$  in the calorimetric cell, respectively. Inhibition effect of A $\beta_{42}$  (D) and H6R-A $\beta_{42}$  (F) on ATP hydrolysis was evaluated using parameters of RS kinetic from (B) and non-linear least squares fitting.



**Supplementary Figure 3. Enzymatic kinetics of Ate1-1 with different substrates.** Raw thermal power was obtained in the single injection ITC assay, performed at 37°C with injections of BSA (A), A $\beta$ <sub>42</sub> (C) or H6R-A $\beta$ <sub>42</sub> (E) into a mixture of Ate1-1, RS, and tRNA in the calorimetric cell. Kinetic curves for BSA (B), A $\beta$ <sub>42</sub> (D), and H6R-A $\beta$ <sub>42</sub> (F) were fitted to the Michaelis–Menten equation to determine the kinetic parameters of Ate1-1.



**Supplementary Figure 4. Enzymatic kinetics of Ate1-3 with different substrates.** Raw thermal power was obtained in the single injection ITC assay, performed at 37°C with injections of BSA (A),  $A\beta_{42}$  (C) or H6R- $A\beta_{42}$  (E) into a mixture of Ate1-3, RS, and tRNA in the calorimetric cell. Kinetic curves for BSA (B),  $A\beta_{42}$  (D), and H6R- $A\beta_{42}$  (F) were fitted to the Michaelis–Menten equation to determine the kinetic parameters of Ate1-3.



**Supplementary Figure 5.** Toxic effects of A $\beta$  peptides (10  $\mu$ M, 20 h) on differentiated Neuro-2a (**A, C**) cells and Ate1 knockout Neuro-2a cells (**B, D**). Cells stained by Annexin-V and propidium iodide (PI) are late apoptotic. The Annexin-V negative and PI positive cells were considered necrotic. Each value is expressed as a percentage of the total number of cells  $\pm$  SD. The experiments were performed three times in triplicates; \* $p < 0.05$ , \*\* $p < 0.01$ .