

## Supplementary Materials

### Catalytic Activities of Ribozymes and DNAzymes in Water and Mixed Aqueous Media

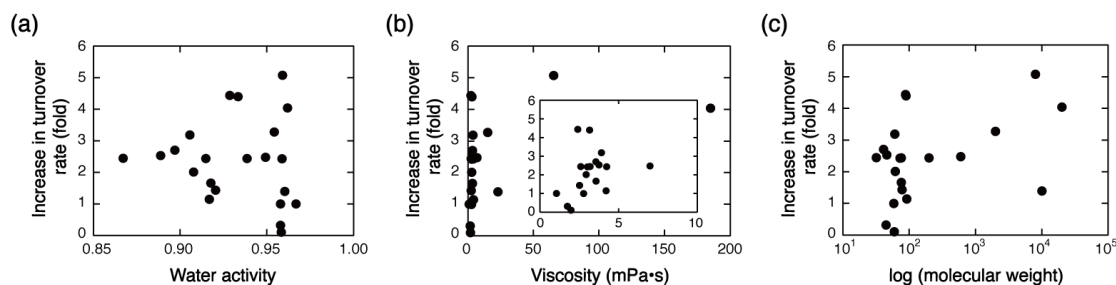
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**Table S1.** Fold increase in the rate of the **17E(S)**-catalyzed single-turnover reaction in mixed solutions in the presence of 10 mM MgCl<sub>2</sub> over the rates in the absence of organic additives

Solution <sup>1</sup>	Fold increase	Solution <sup>1</sup>	Fold increase	Solution <sup>1</sup>	Fold increase
PEG20000	0.71	PDO	0.32	FA	<0.0003
PEG8000	0.51	MME	0.093	DMF	<0.0003
PEG2000	0.43	DME	0.25	AcAm	0.0086
PEG600	0.29	MeOH	0.28	AcCN	0.017
PEG200	0.25	EtOH	0.11	DMSO	0.092
EG	0.35	PrOH	0.0048	DOX	0.062
Glyc	0.46	Urea	<0.0003	Dex	0.70

<sup>1</sup> Abbreviations: PEG (polyethylene glycol with an average molecular weight ranging from  $2 \times 10^4$  to  $2 \times 10^5$ ), EG (ethylene glycol), Glyc (glycerol), PDO (1,3-propanediol), MME (2-methoxyethanol), DME (1,2-dimethoxyethane), MeOH (methanol), EtOH (ethanol), PrOH (1-propanol), FA (formamide), DMF (*N,N*-dimethylformamide), AcAm (acetamide), AcCN (acetonitrile), DMSO (dimethyl sulfoxide), DOX (1,4-dioxane), and Dex (dextran with an average molecular weight of  $1 \times 10^4$ ).

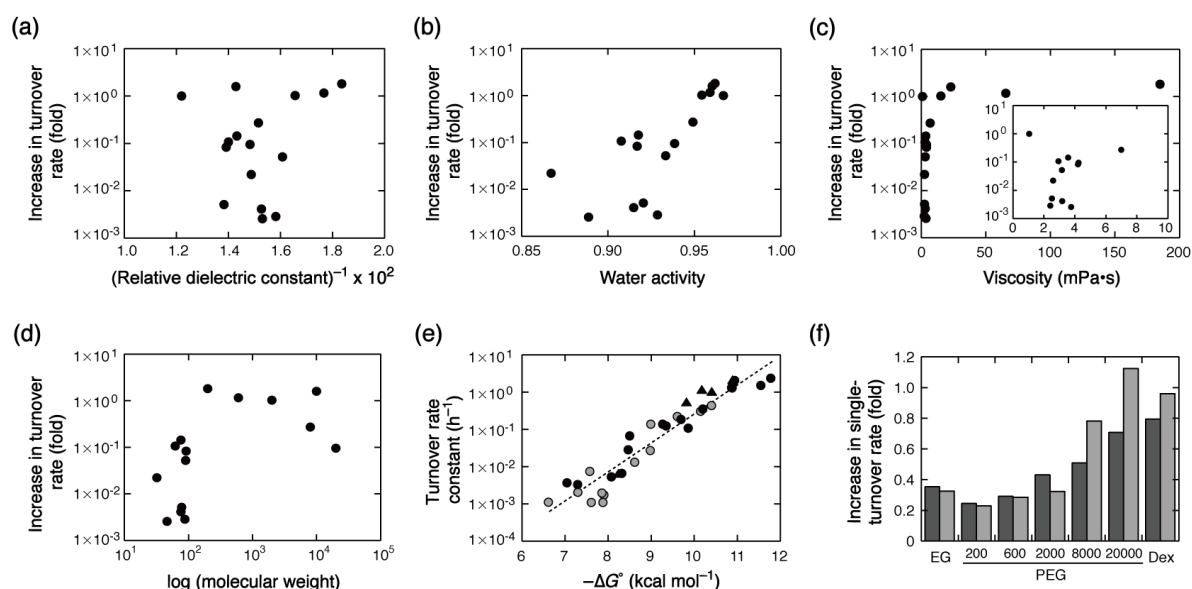
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**Figure S1.** Plots of the increments of the turnover rate of the **HH(S)**-catalyzed reaction in the presence of 10 mM  $\text{MgCl}_2$  against (a) water activity, (b) viscosity, or (c) the logarithm of the additives' molecular weight.

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**Figure S2.** Plots of the increments of the turnover rate of the **17E(S)**-catalyzed reaction in the presence of 10 mM  $\text{MgCl}_2$  against (a) the inverse of the relative dielectric constant, (b) water activity, (c) viscosity, (d) the logarithm of the additives' molecular weight, or (e) the free energy change at 37°C (the symbols are the same those in Table 2e). (f) Increments of the single-turnover rates of the reactions catalyzed by **17E(S)** (black) or **17E(L)** (gray) in solutions containing 10 mM  $\text{MgCl}_2$ , with EG, PEGs, or Dex.

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