

**Supplementary information**

**for**

**How global RNA-binding proteins coordinate the behaviour of RNA  
regulons: an information approach**

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## Supplementary tables

Table S1. Example of calculation of information-related parameters for the model hub-centred network shown in Figure 1A at  $T = 5$  and  $1 \leq A \leq 20$ .

Table S2. Example of calculation of information-related parameters for the model of a specific RNA-protein interaction shown in Figure S2A at  $Q = 10$  and  $1 \leq A \leq 20$ .

Table S3. Example of calculation of information-related parameters for the model hub-centred network with an overexpressed target shown in Figure 4A at  $T = 9$ ,  $Q = 10$ , and  $1 \leq A \leq 20$ .

Table S4. Example of calculation of information-related parameters for the model network with two overlapping hub interactomes shown in Figure 7A at  $T = 3$ ,  $S = 4$ , and  $1 \leq A \leq 20$ .

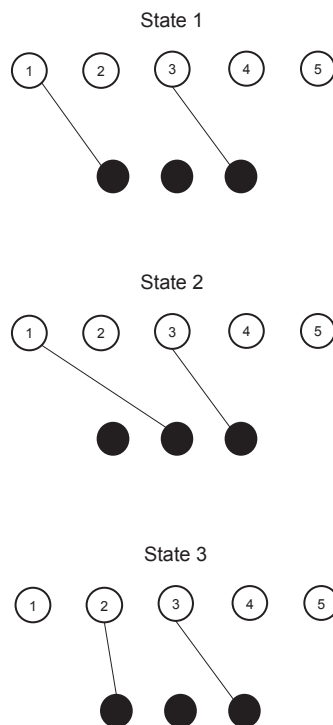
Table S5. Source data for the model hub-centred network shown in Figure 1A.

Table S6. Source data for the model of a specific RNA-protein interaction shown in Figure S2A.

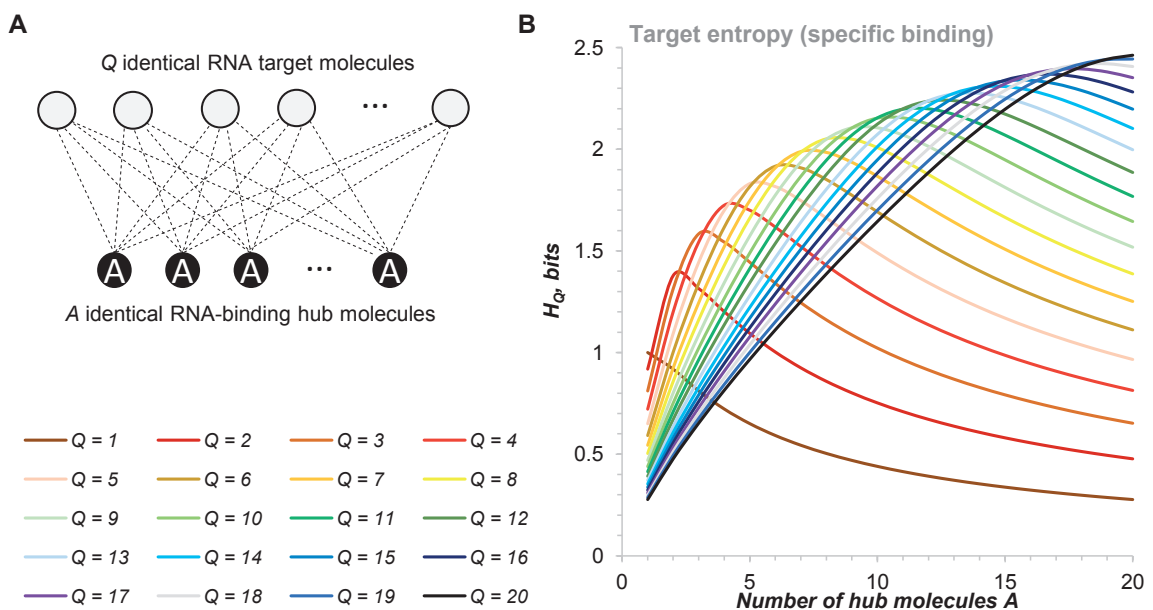
Table S7. Source data for the model hub-centred network with an overexpressed target shown in Figure 4A.

Table S8. Source data for the model network with two overlapping hub interactomes shown in Figure 7A.

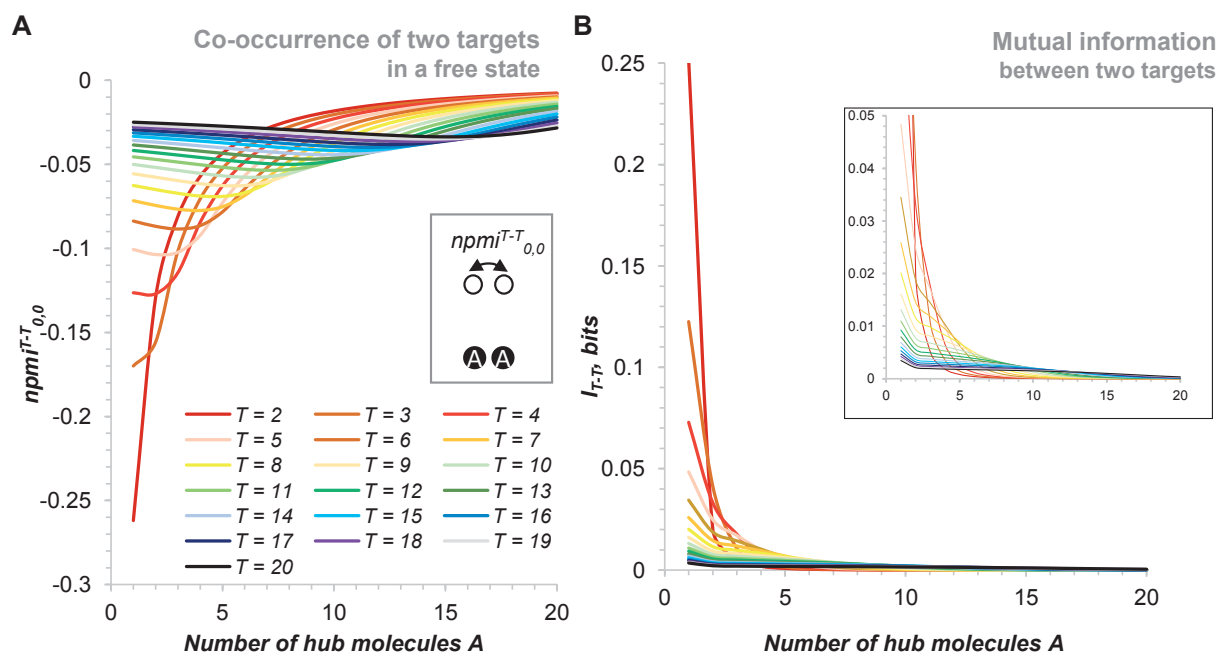
## Supplementary figures



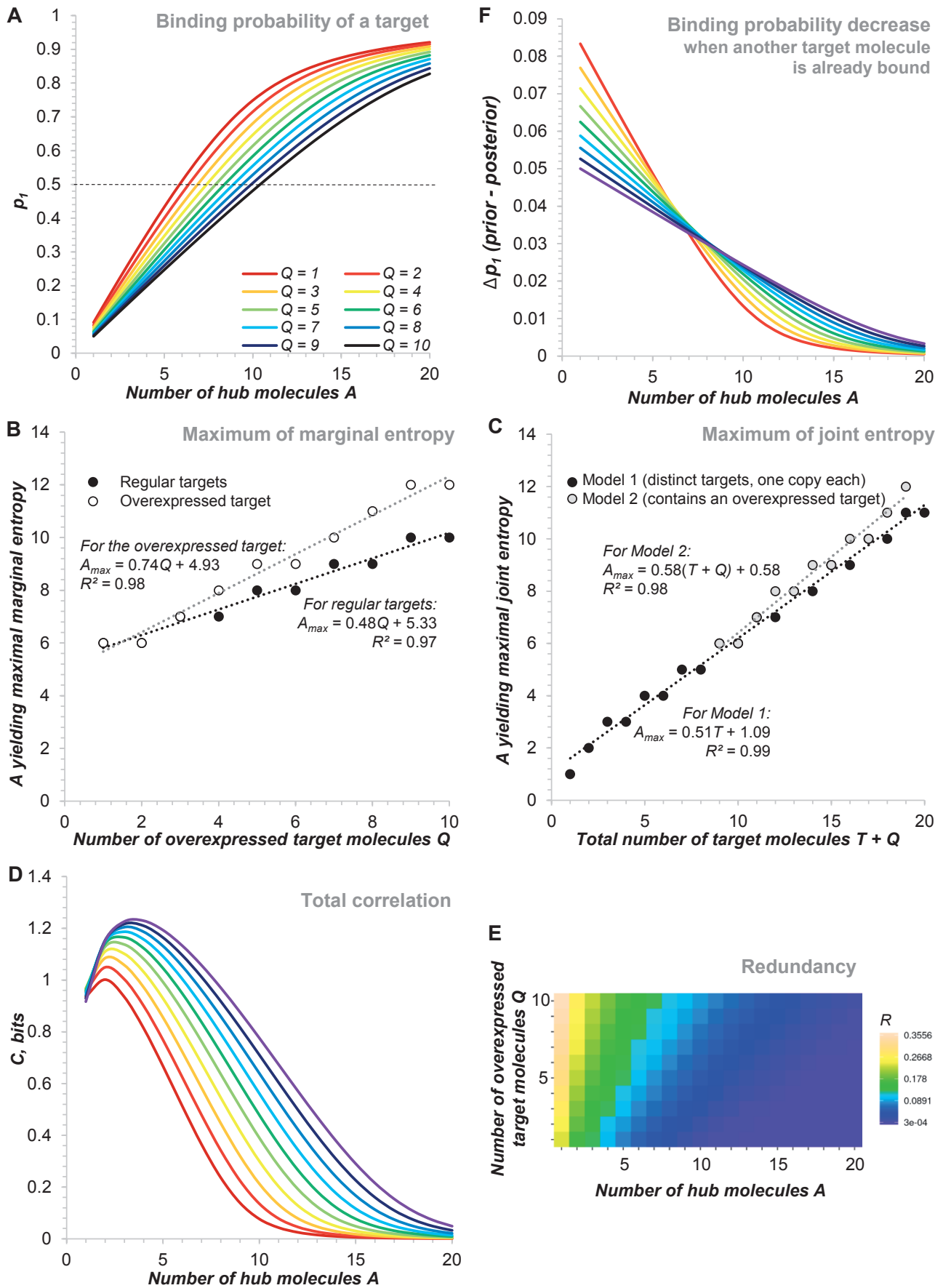
**Figure S1. Examples of different states for a model hub-centred network.** States 1 and 2 are different realisations of the same system configuration where the targets 1 and 3 are bound. By contrast, the States 1 and 3 belong to two different configurations since in the latter case bound are the targets 2 and 3.



**Figure S2. Model of specific binding of a single RNA target, present in  $Q$  copies, to an RBP, present in  $A$  copies. (A) Schematic of the model. (B) Target entropy distribution as a function of  $Q$  and  $A$ . See Table S6 for source data.**

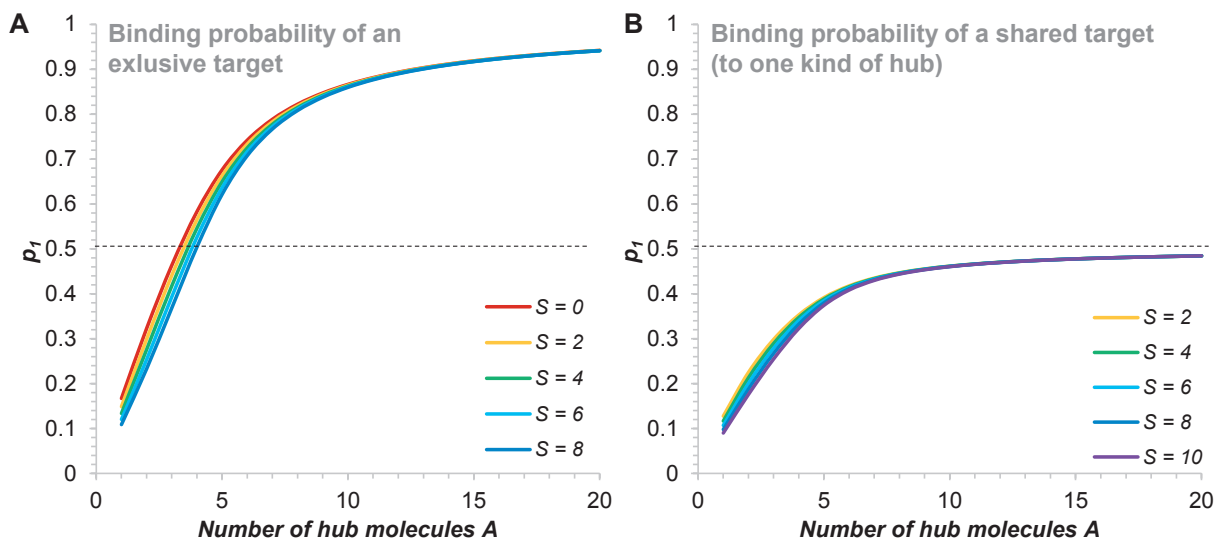


**Figure S3. Pairwise mutual information measures in the model hub-centred network. (A)** The  $npmi$  between two unbound targets as a function of the total number of targets  $T$  and the abundance of the hub  $A$ . **(B)** Mutual information between two targets as a function of  $T$  and  $A$ . The inset shows a more detailed view in the lower left area of the plot. See Table S5 for source data.

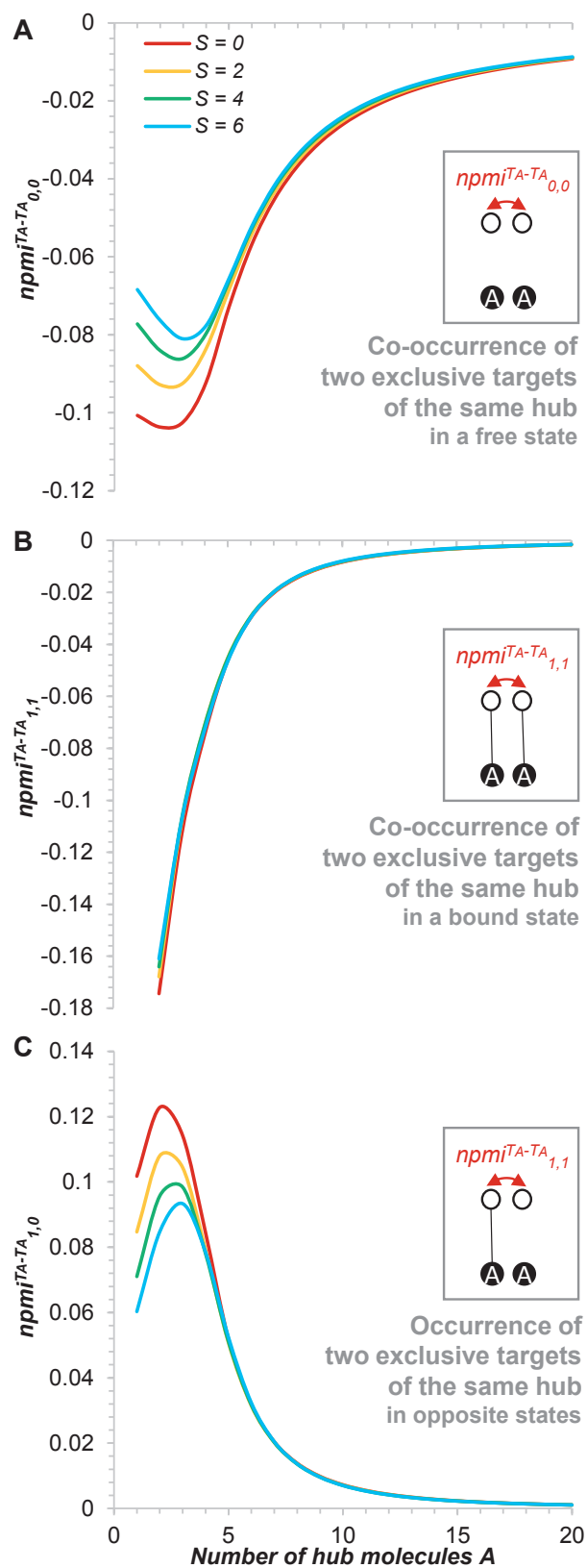


**Figure S4. Binding statistics and information properties of a model hub-centred network with an overexpressed target.** (A) Binding probability of a target (either regular or overexpressed) as a function of the overexpression level  $Q$  and the hub abundance  $A$ . (B) Peak

positions of the marginal entropy distributions for regular and the overexpressed targets shown in Figure 4D, E. (C) Peak positions of the joint entropy distributions shown in Figure 4F (grey circles). For comparison, the peak positions of joint entropy from the model without overexpression (Figure 1C) are shown. (D) Total correlation as a function of  $Q$  and  $A$ . (E) Redundancy as a function of  $Q$  and  $A$  (heat map generated in Heatmapper, Babicki et al., 2016). (F) Reduction of binding probability upon binding of another target molecule, as a function of  $Q$  and  $A$ . Both regular and overexpressed targets show identical binding probability shifts caused by competitive interactions of other target molecules. See Table S7 for source data.



**Figure S5. Binding probabilities of exclusive (A) and shared targets (B) in the model network with two hubs sharing  $S$  targets. See Table S8 for source data.**



**Figure S6.**  $npmi$  between two exclusive targets interacting with the same hub as a function of the overlap between two interactomes  $S$  and the abundance of the hubs  $A$ . See Table S8 for source data.