

choose  $\gamma$ : resolution parameter

$$Q = \frac{1}{2N} \sum_{ij} (W_{ij} - \gamma E_{ij}) \delta_{\sigma_i \sigma_j}$$

Optimize  $Q$  over all possible partitions

a modified  
Louvain algorithm

Define boundary scores  
and consensus boundaries

output

consensus TADs

adjacent chromosomal bins  
every bin has its own domain id



increase  $Q$ ?

a random bin is selected, update  
is based on the neighbors' id



domain id is updated, another  
bin is selected



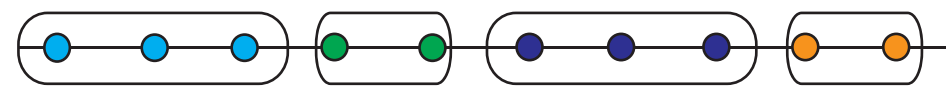
increase  $Q$ ?

No more update; iteration stops

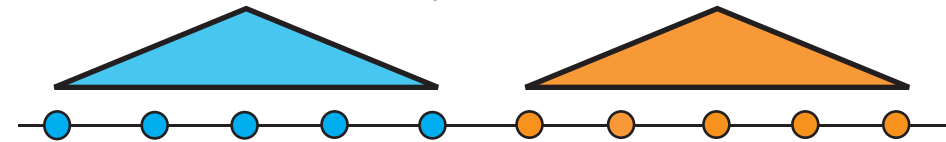


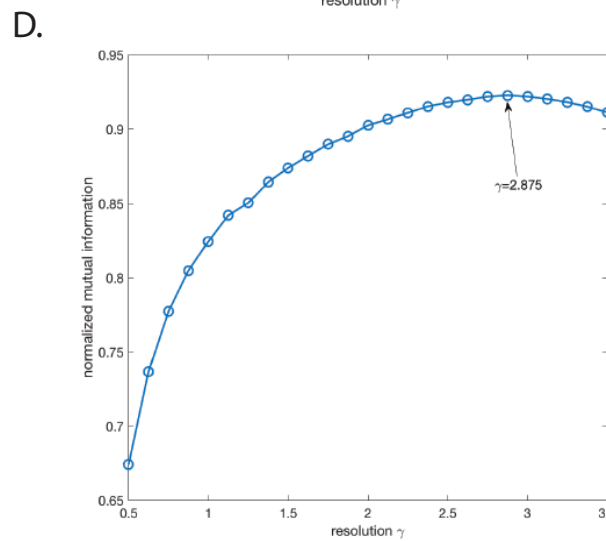
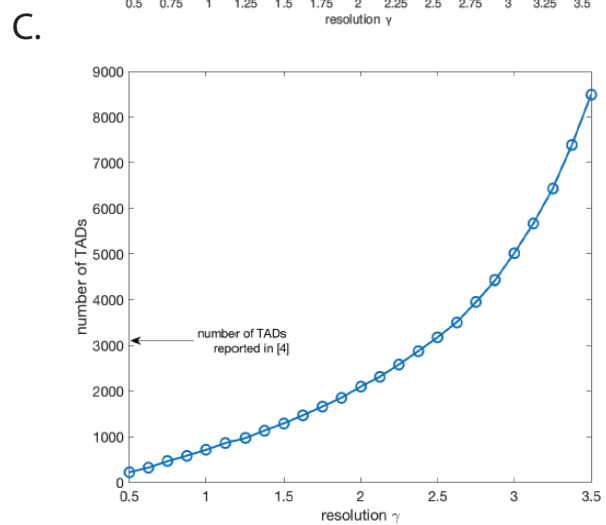
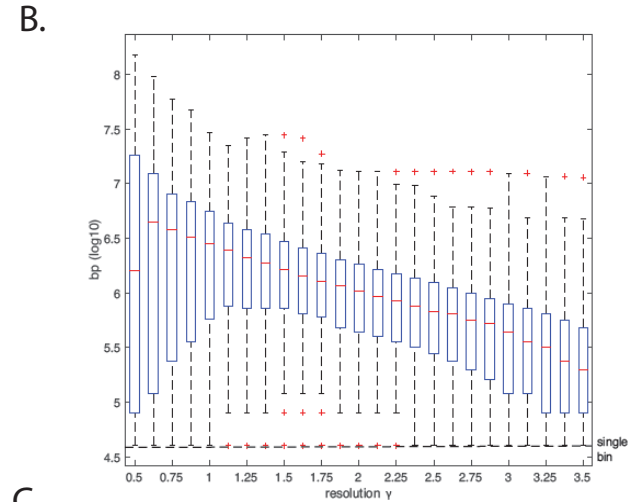
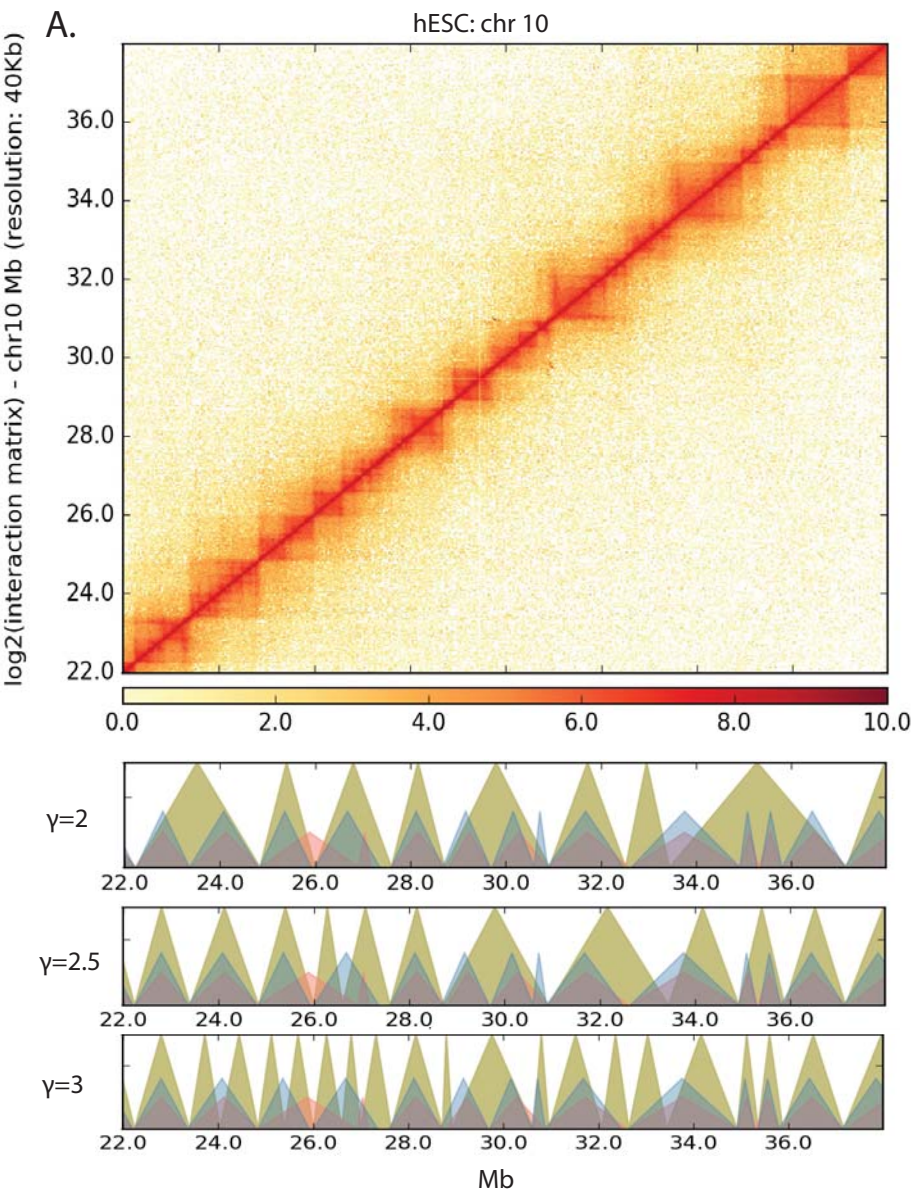
increase  $Q$ ?

bins are renormalized to form  
super-bins; previous steps  
are repeated

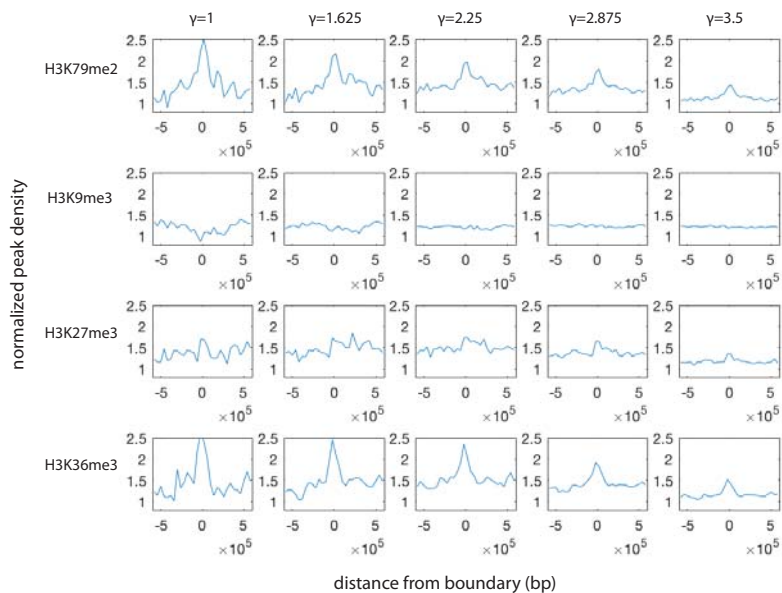


No more update;  
No more renormalization  
two TADs are obtained

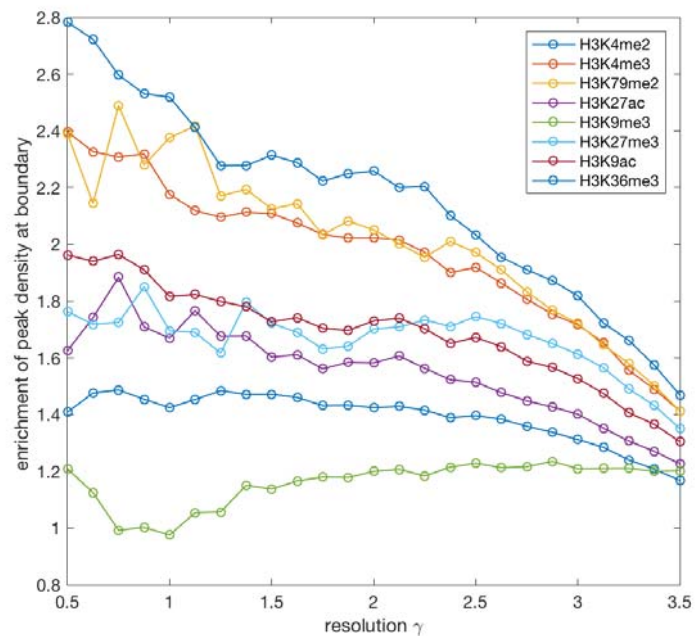




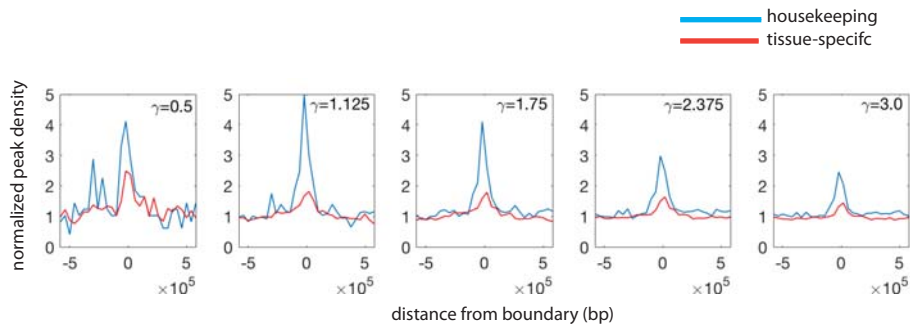
A.



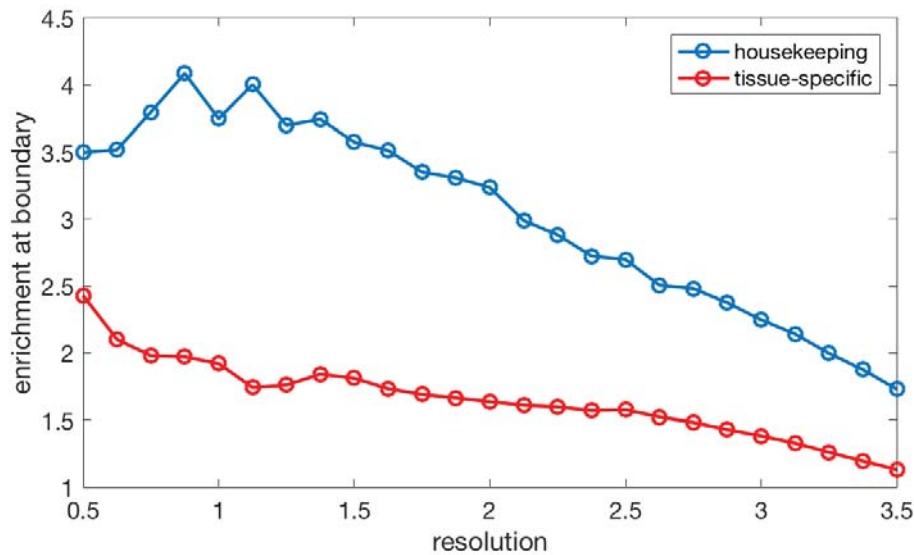
B.



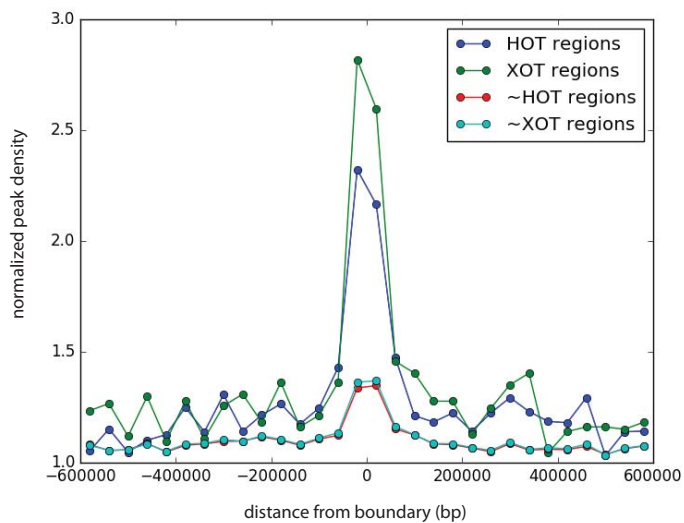
A.



B.



A.



B.

