

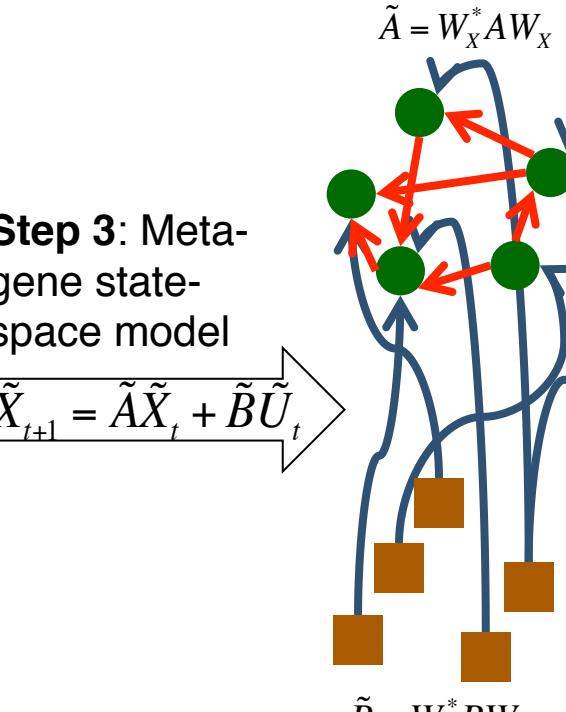
### Step 5: Gene dynamic patterns in Group $X$

- internal regulations in  $X$ ; i.e., iPDP coefficients
- external regulations from  $U$ ; i.e., ePDP coefficients

Internal regulation among genes/meta-genes Group  $X$  by  $A/\tilde{A}$

External regulation from genes/meta-genes in Group  $X$  to genes/meta-genes in Group  $U$  by  $B/\tilde{B}$

● Genes/Meta-genes in Group  $X$  ■ Genes/Meta-genes in Group  $U$



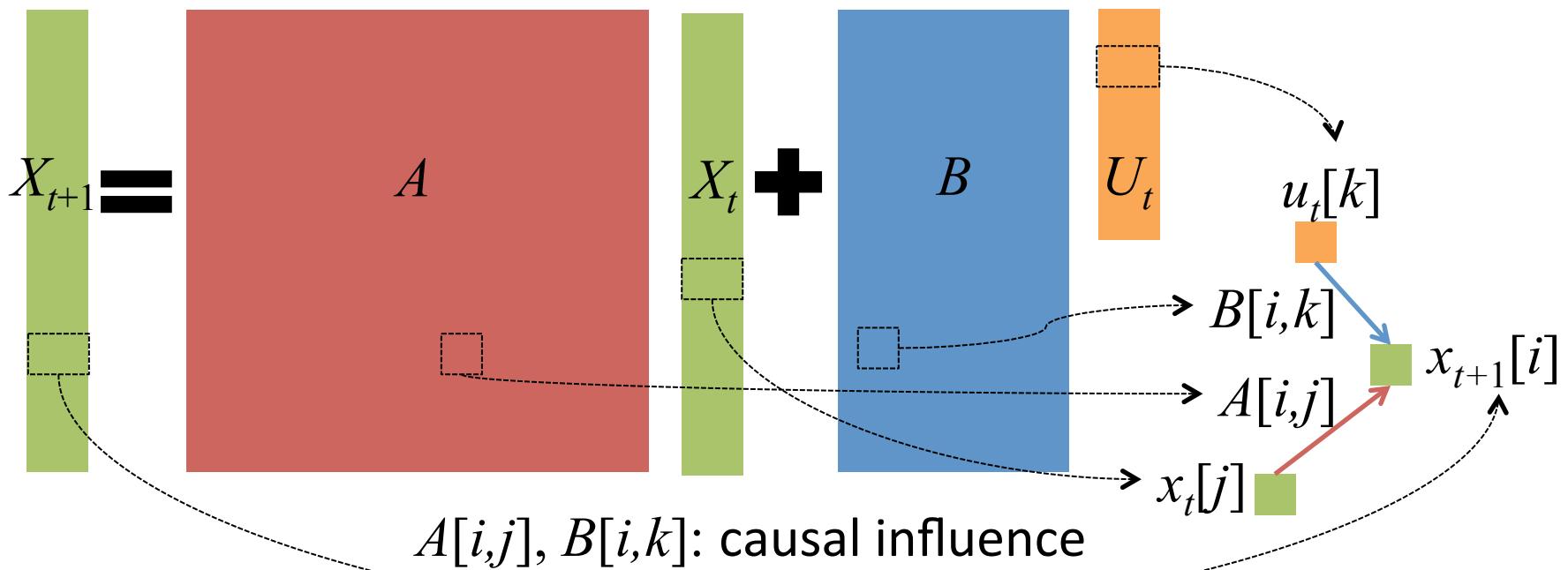
Eigenvalues of  $\tilde{A}$  - dynamics driven by internal regulations => iPDPs

Eigenvalues of  $\tilde{B}$  - dynamics driven by external regulations => ePDPs

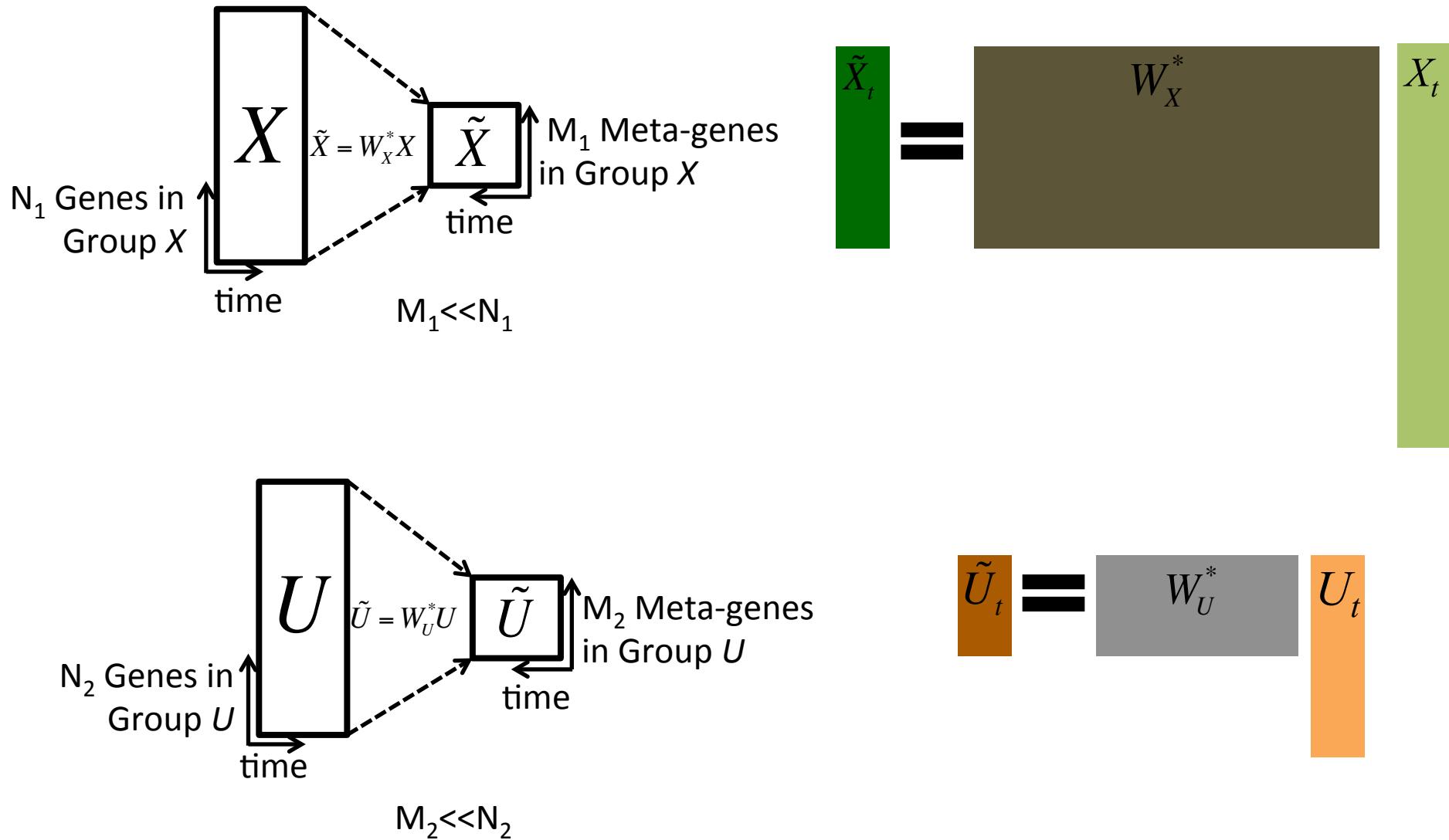
**Figure 1**

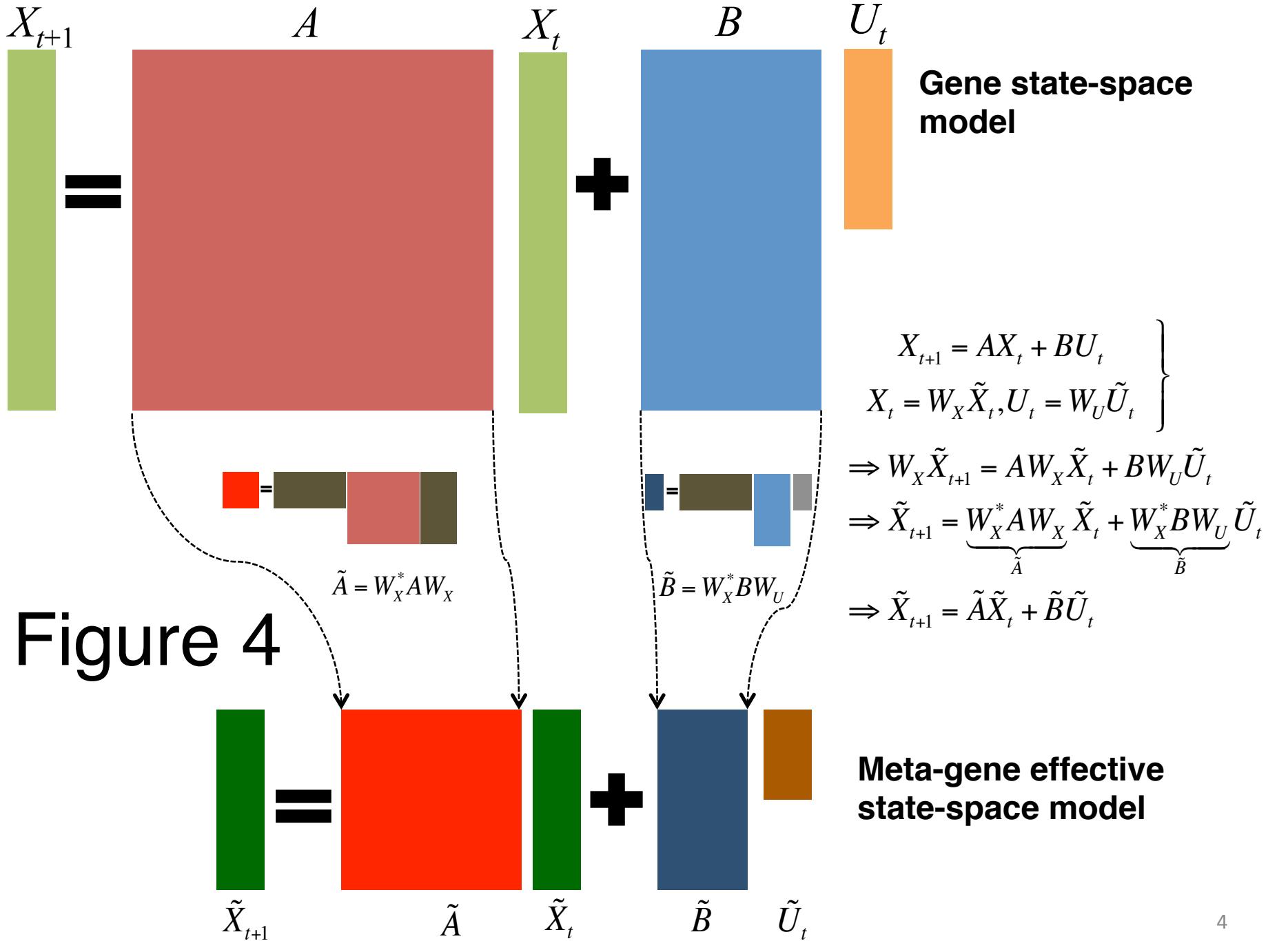
# Figure 2

- Linear difference equation:  $X_{t+1} = AX_t + BU_t$



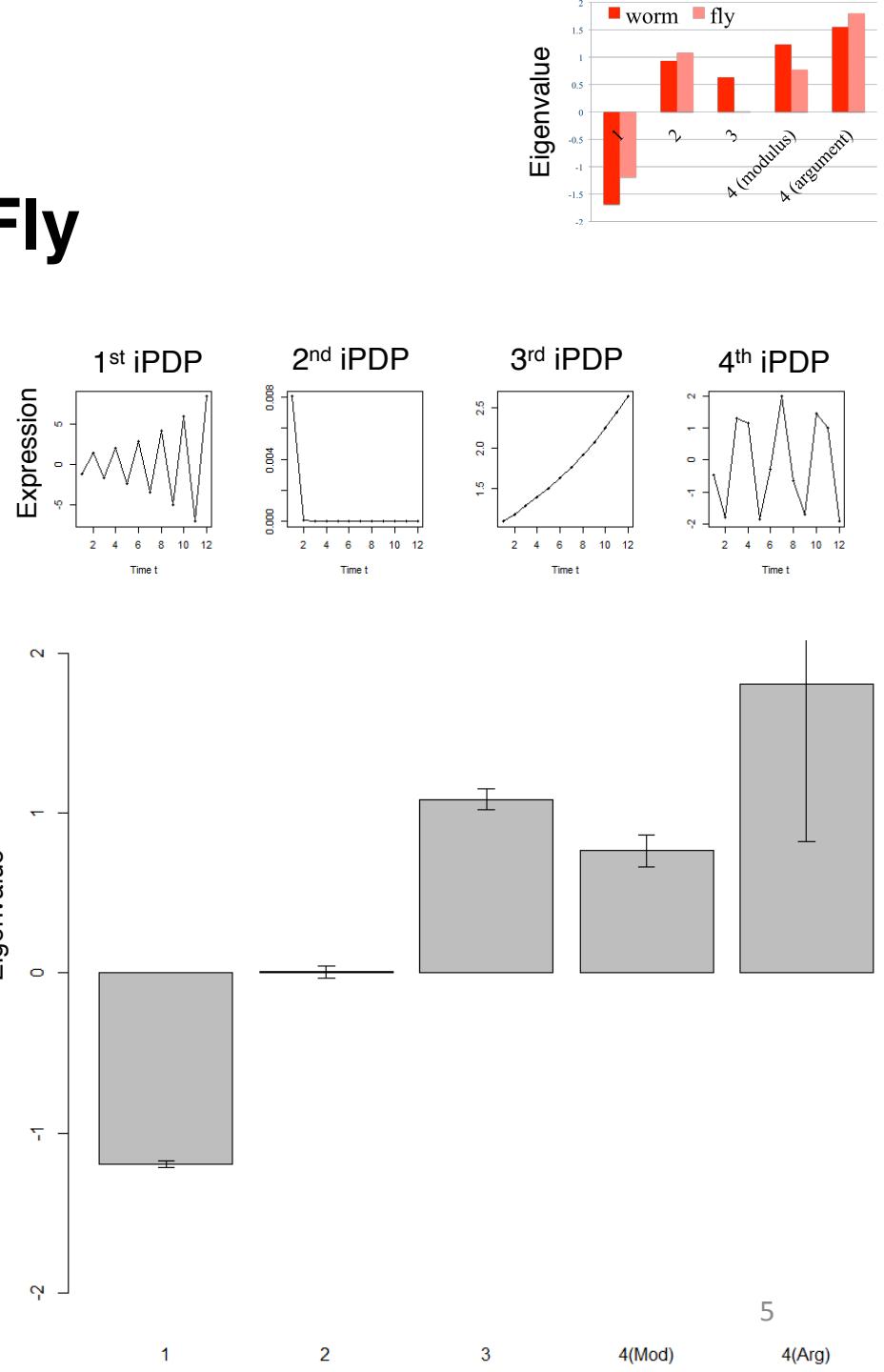
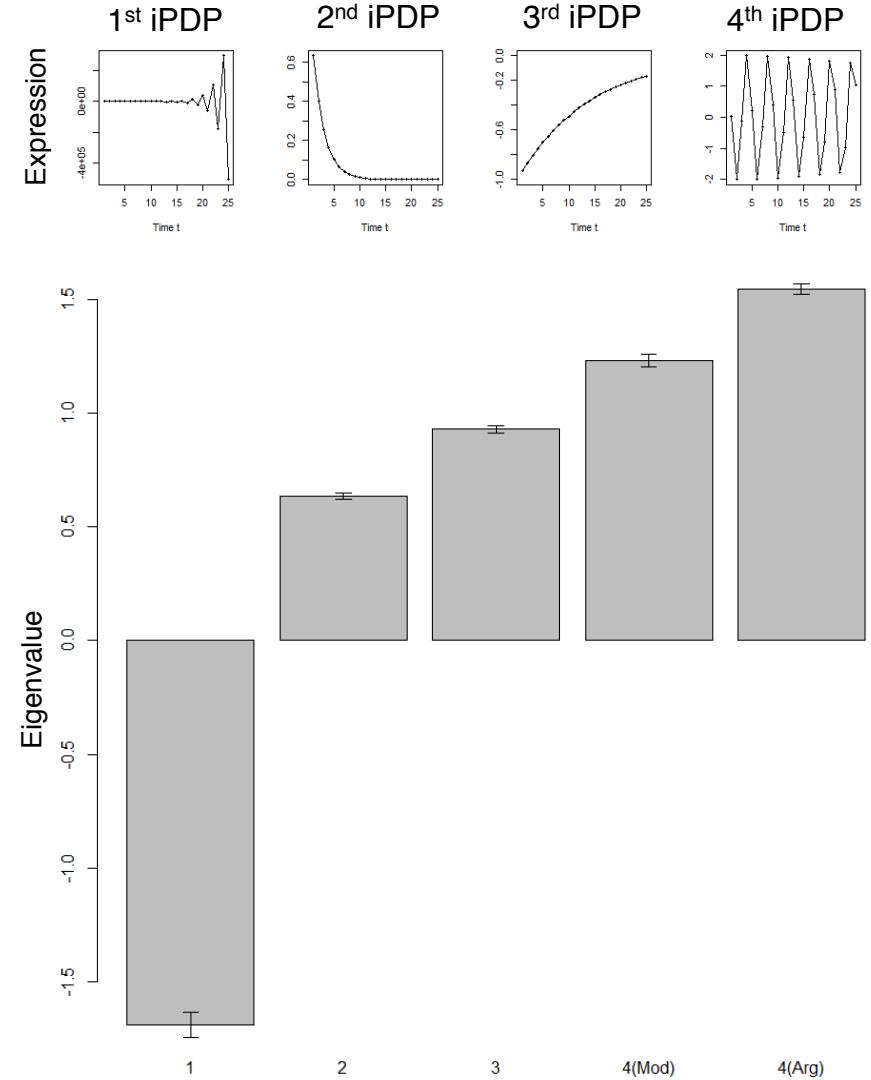
# Figure 3





# Figure 5

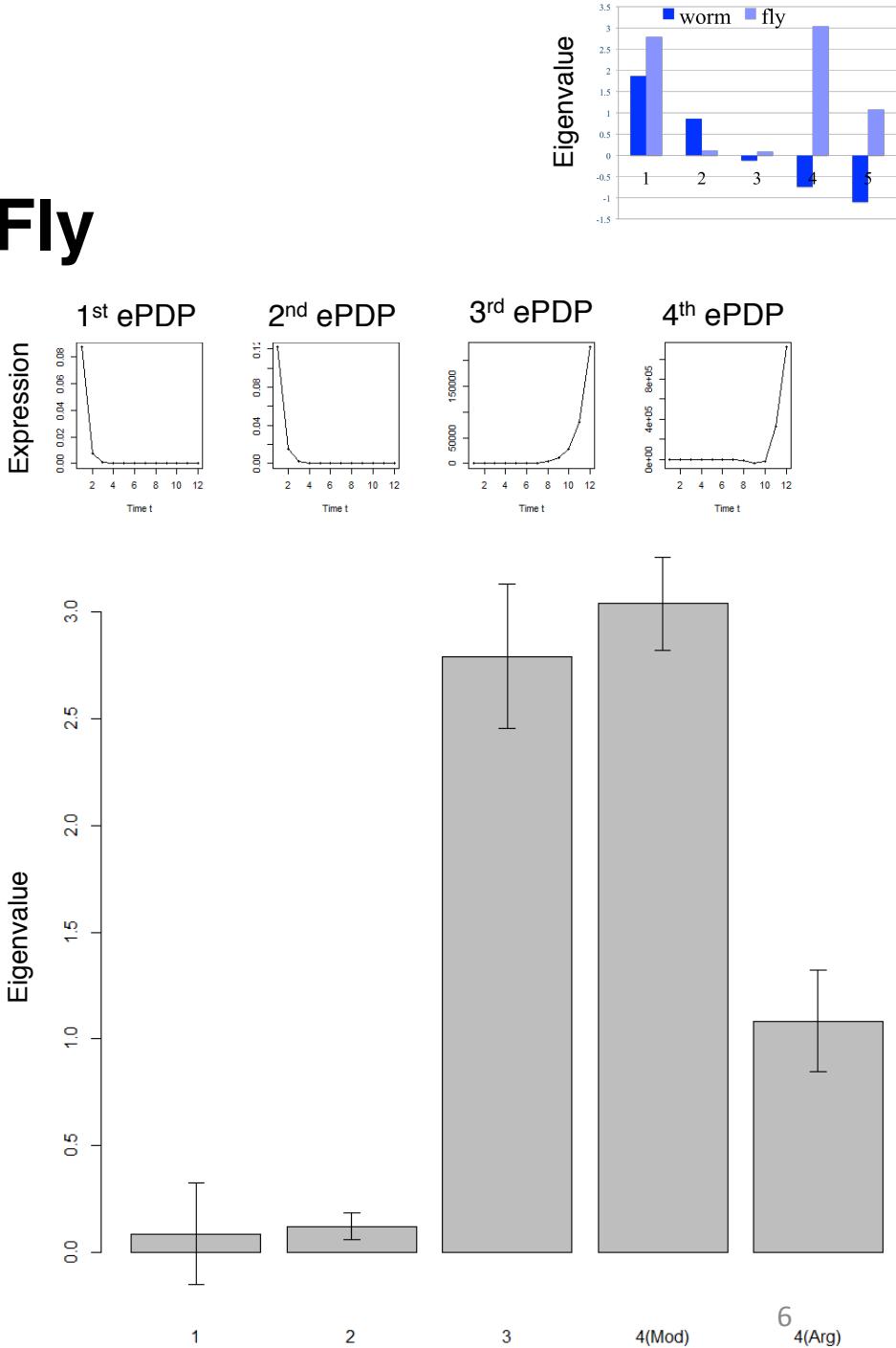
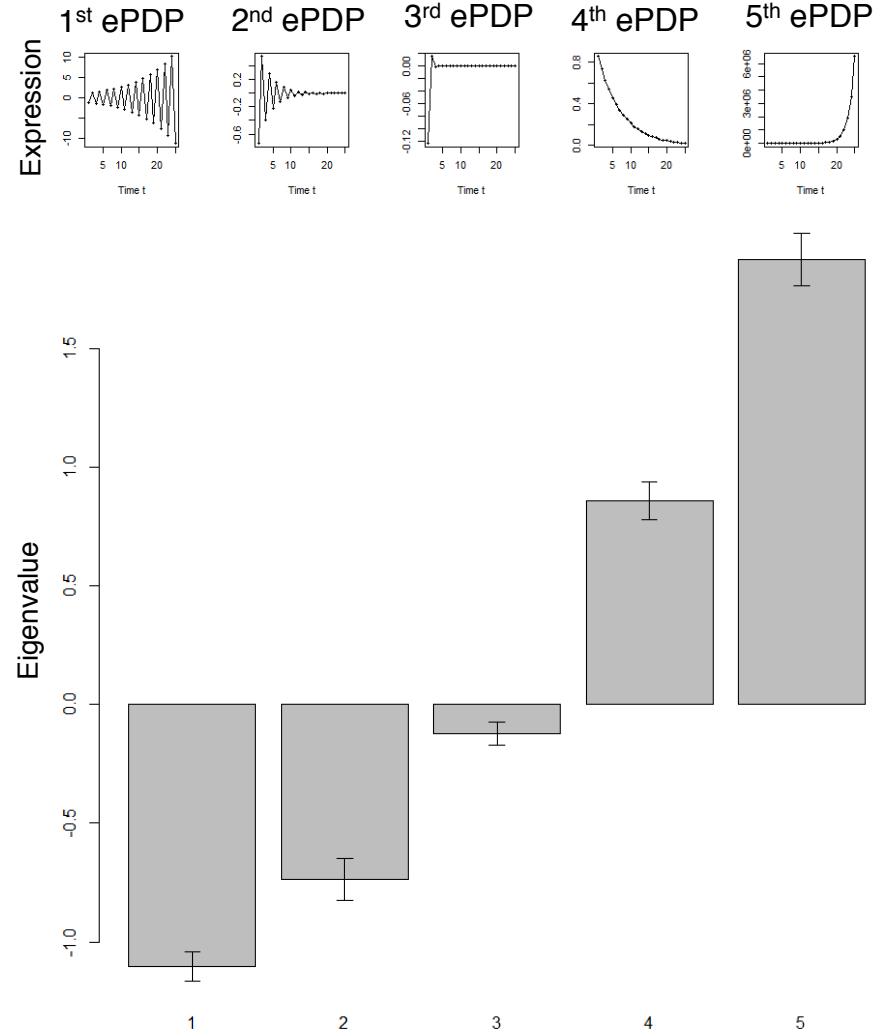
## Worm Fly



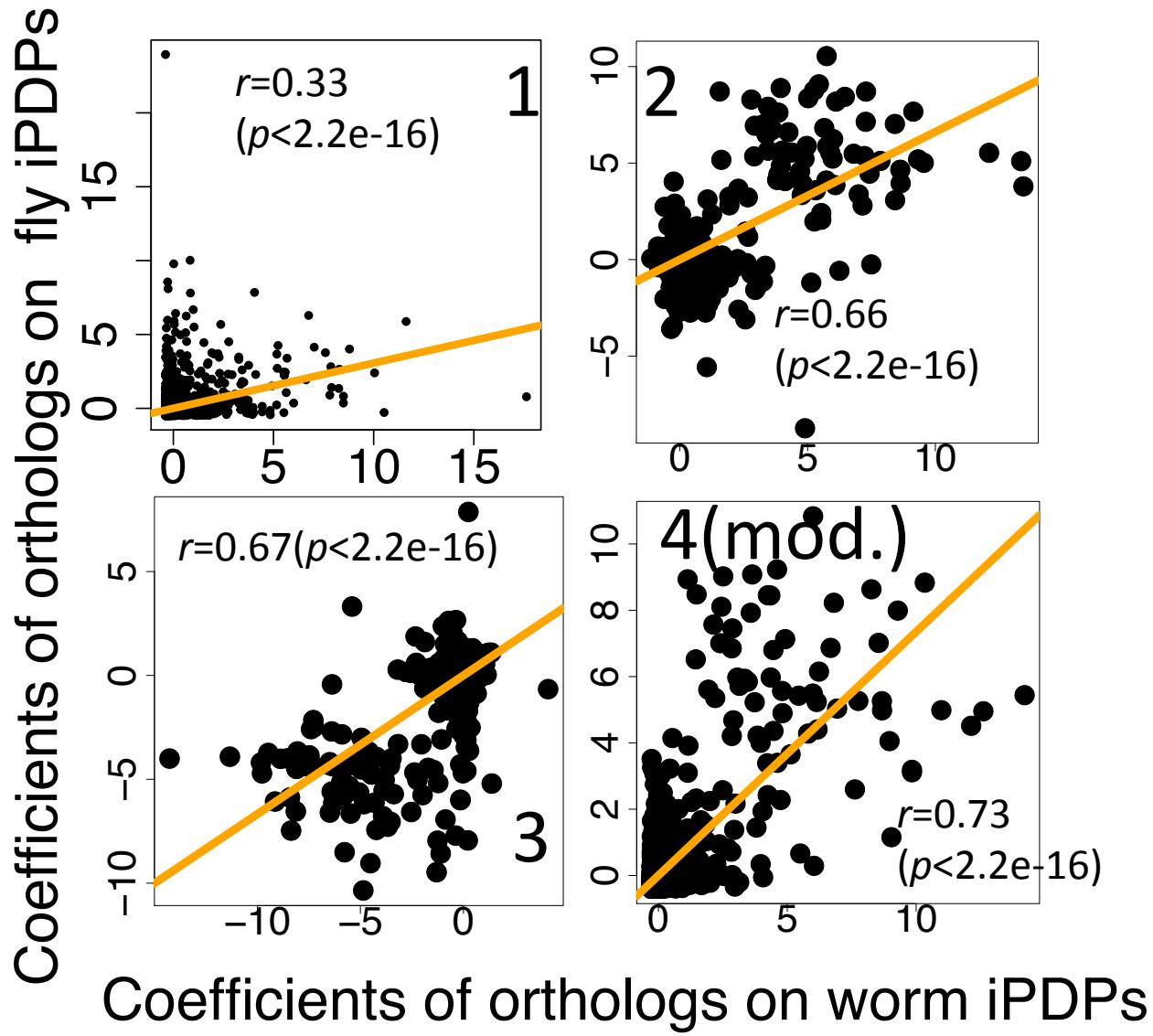
# Figure S1

**Worm**

**Fly**

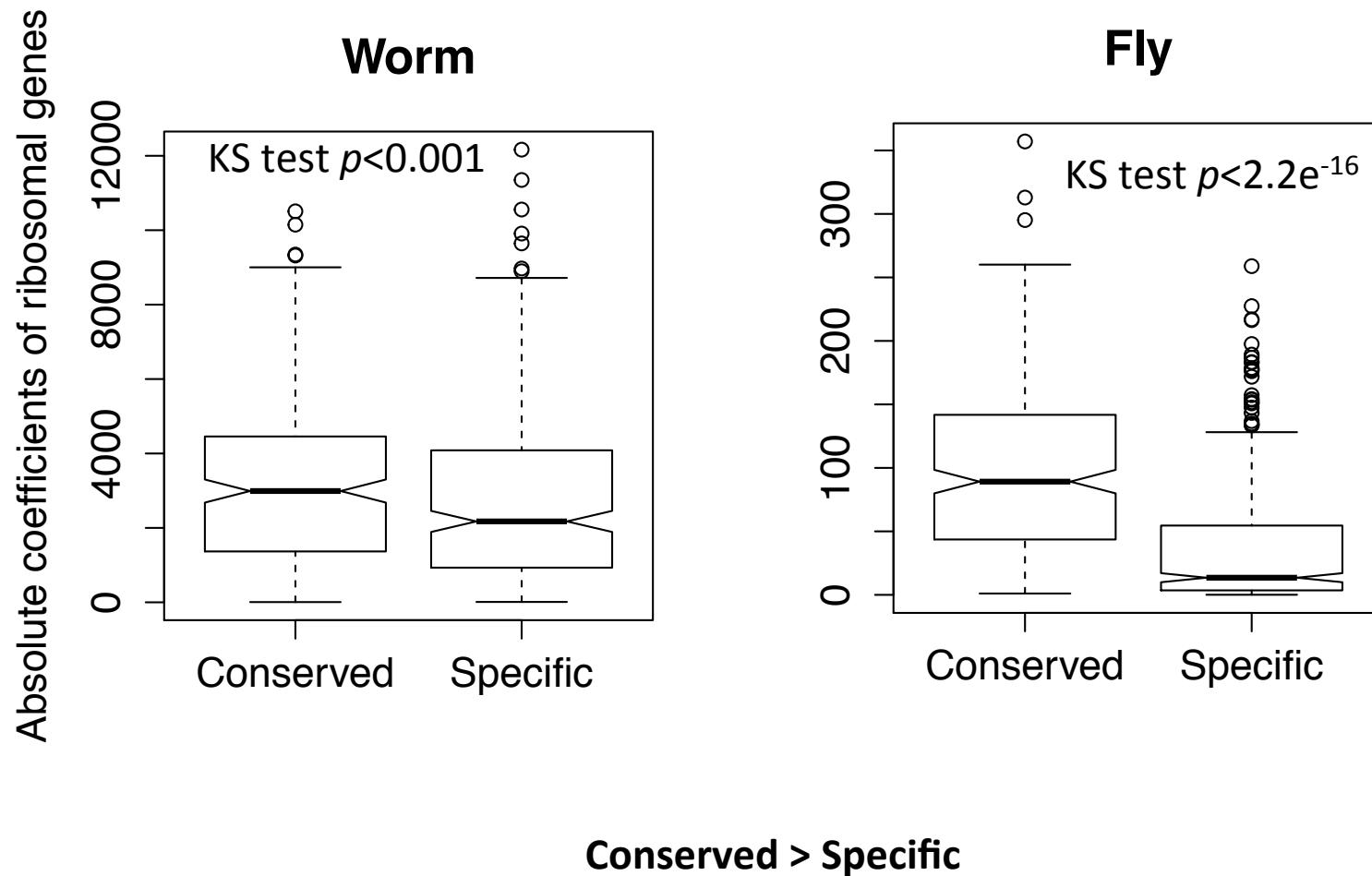


# Figure 6



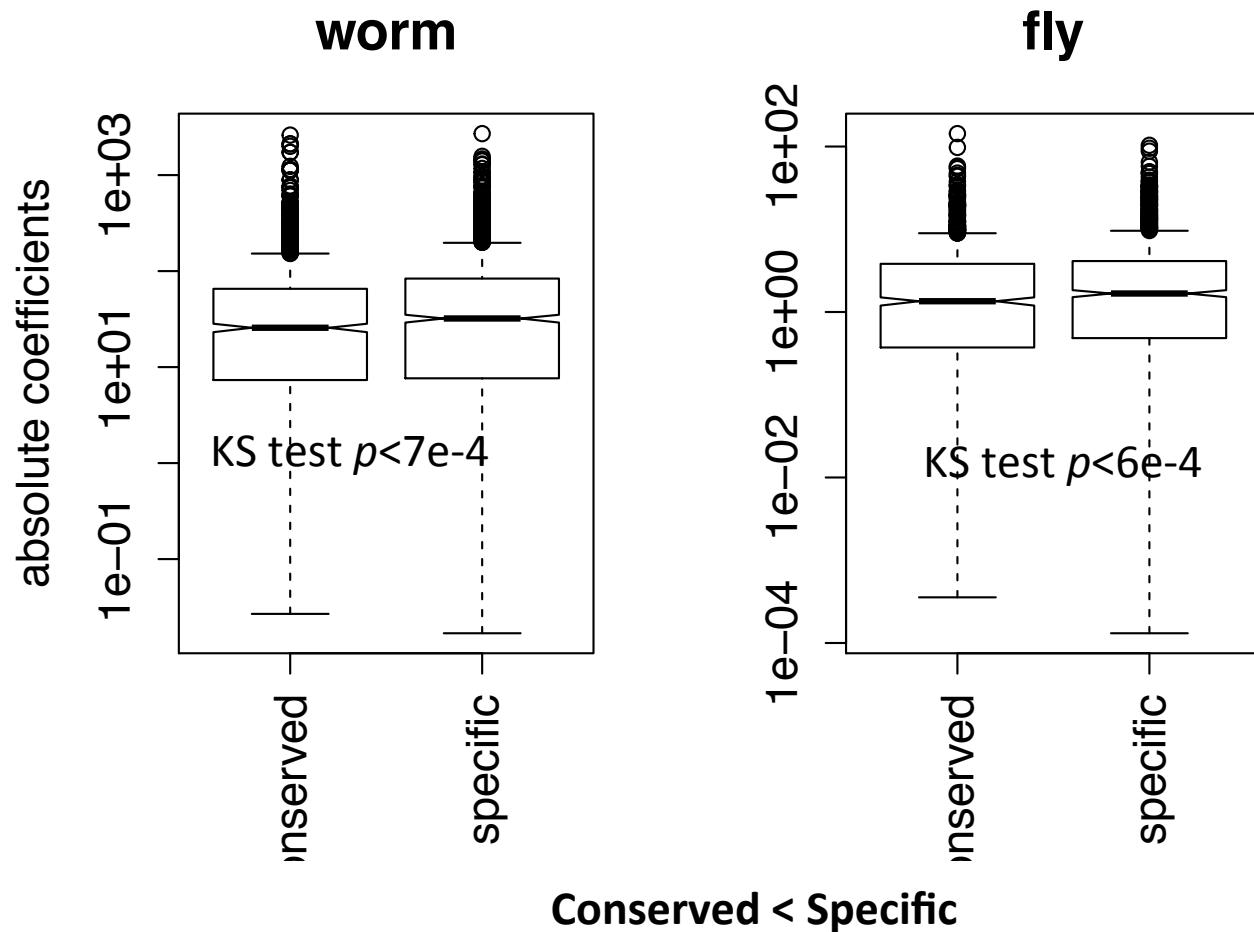
# Figure 7A

## Ribosomal genes: coefficients over conserved (iPDP) and specific (ePDP) meta-patterns



# Figure 7B

## Signaling genes: coefficients over conserved (iPDP) and specific (ePDP) meta-patterns



Top 10% orthologous genes have most negative coefficients on 2<sup>nd</sup> iPDP; i.e., fast growing pattern

# Figure 8

