**Additional file 10: Protein complexes and dN/dS based on orthologs from a variety of species Complexes and dN/dS based on Human-Dog Orthologs**

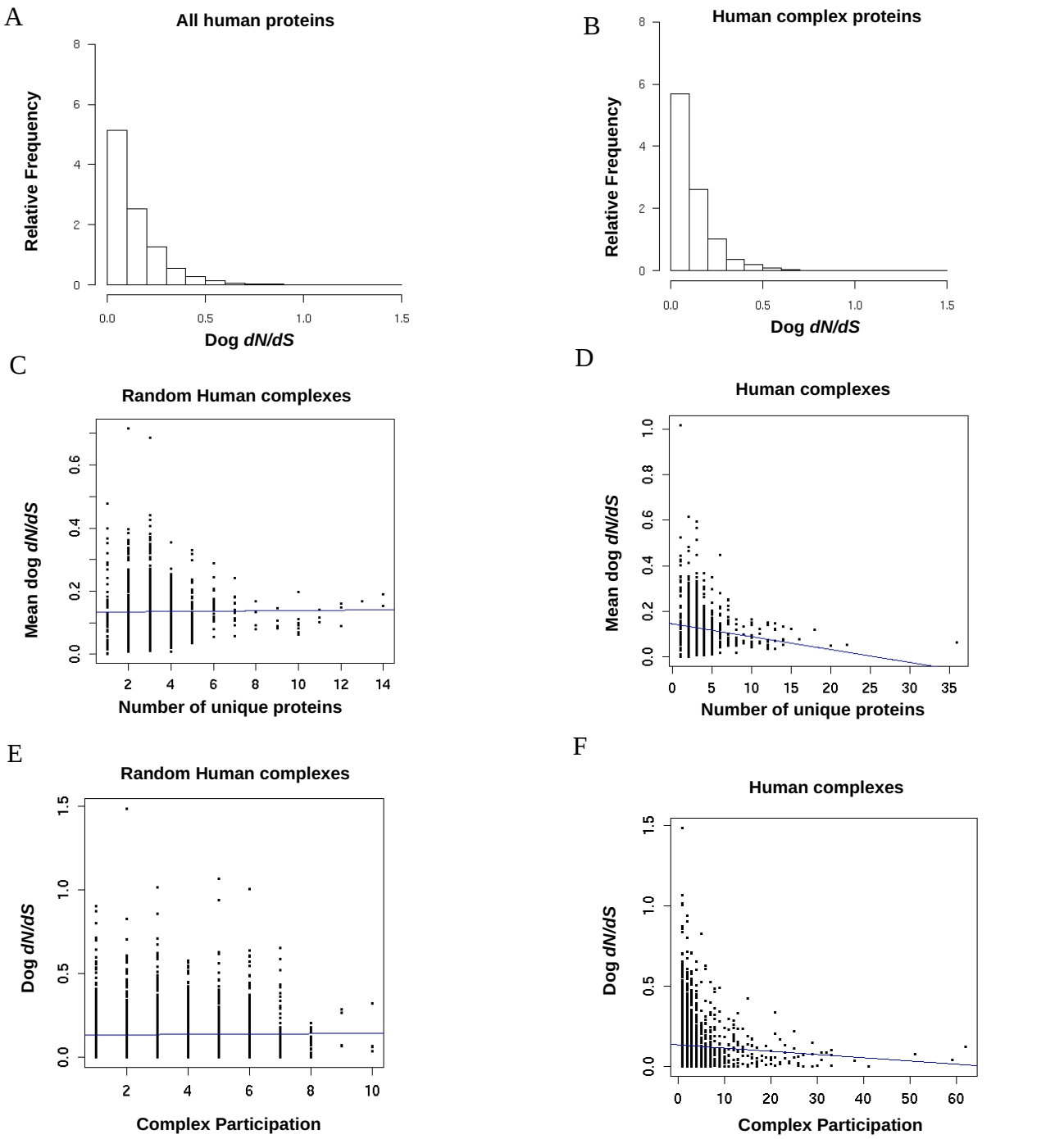



**Figure S10a - Complexes and Selection.** The dN/dS distribution of genes associated with A) all human proteins and B) proteins in the human complex data. D) The mean dN/dS ratio for human-dog orthologs is plotted against the number of unique proteins for each complex. Complexes with more unique proteins tend to have significantly smaller mean dN/dS ratios than those with less unique proteins (t-test: $P < 4.7 \times 10^{-8}$). F) The dN/dS ratios for human-dog orthologs are plotted against the number of complexes they participate in. Proteins participating in more complexes have significantly lower dN/dS ratios than those with less complex participation (t-test: $P < 2.1 \times 10^{-8}$). C,E) Both trends are rarely observed for Model 1 random complexes.

## Complexes and dN/dS based on Human-Chimp Orthologs

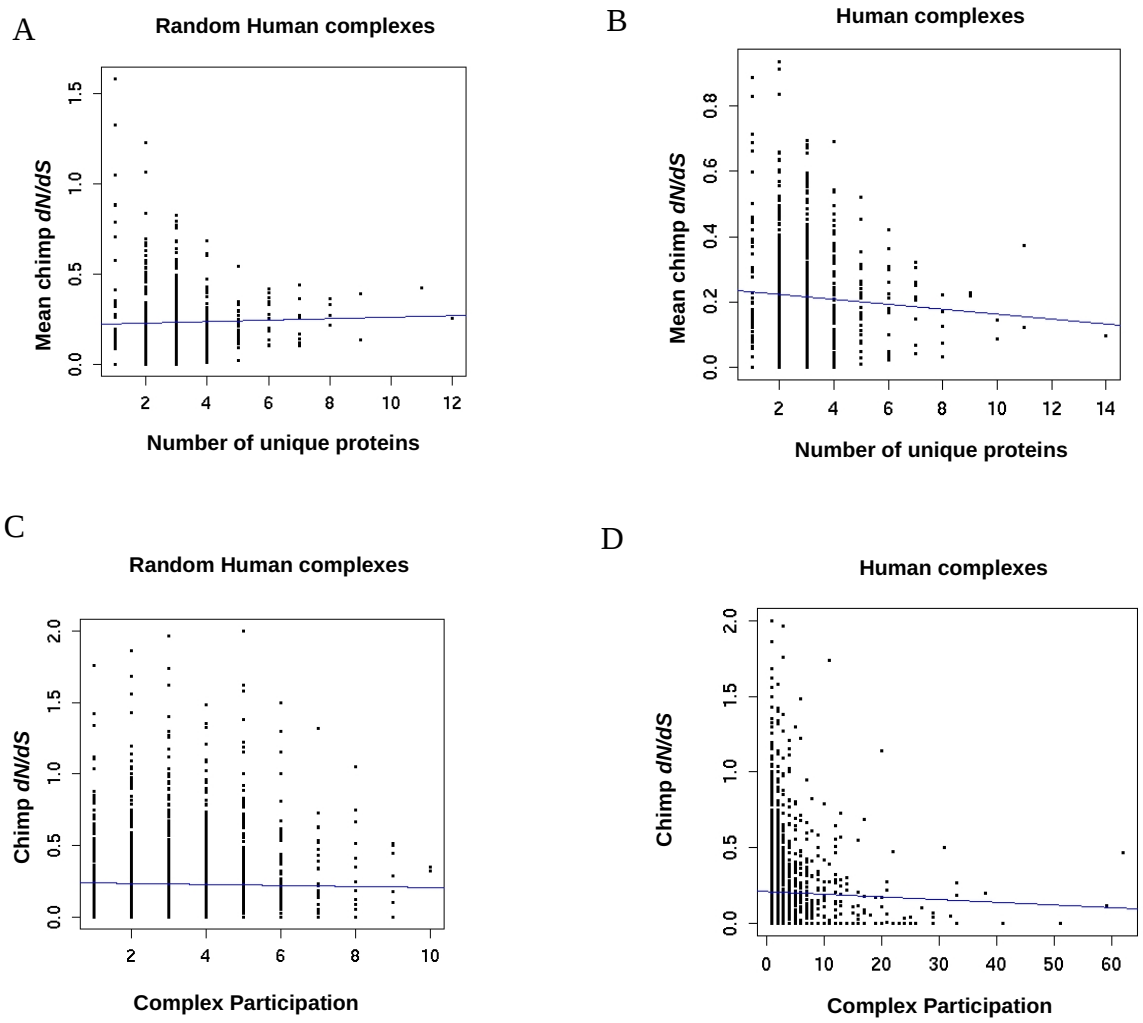
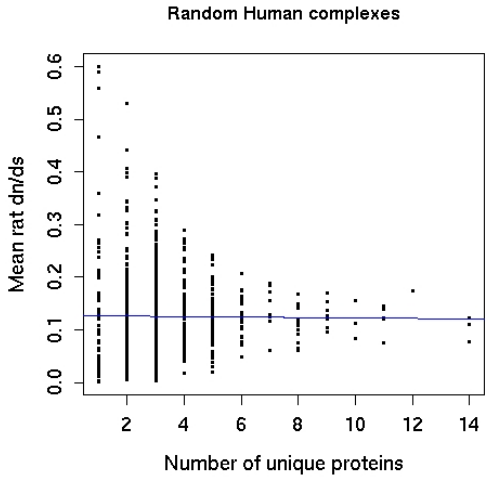


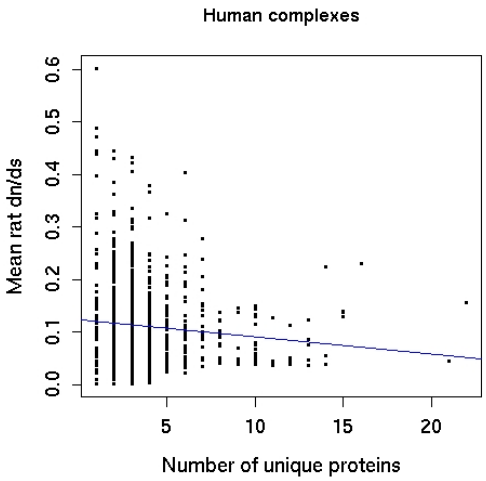

**Figure S10b - Complexes and Selection.** B) The mean dN/dS ratio for human-chimp orthologs is plotted against the number of unique proteins for each complex. Complexes with more unique proteins were not considered to have significantly smaller mean dN/dS ratios than those with less unique proteins (t-test: P = 0.1). D) The dN/dS ratio for human-chimp orthologs is plotted against the number of complexes they participate in. Proteins participating in more complexes have significantly lower dN/dS ratios than those with less complex participation (t-test: P < 0.0002). A,C) Such trends were not observed in model 1 random complexes.

## Complexes and dN/dS based on Human-Rat Orthologs

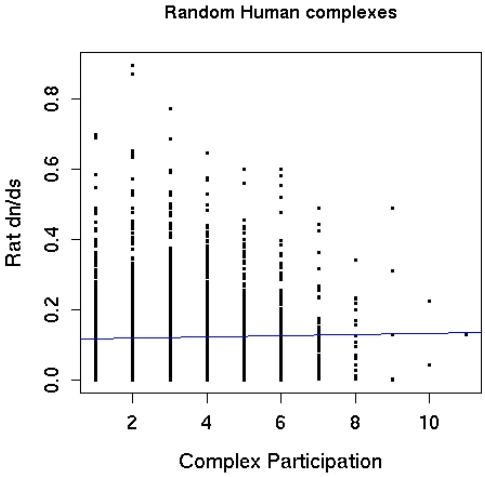
A




B




C




D

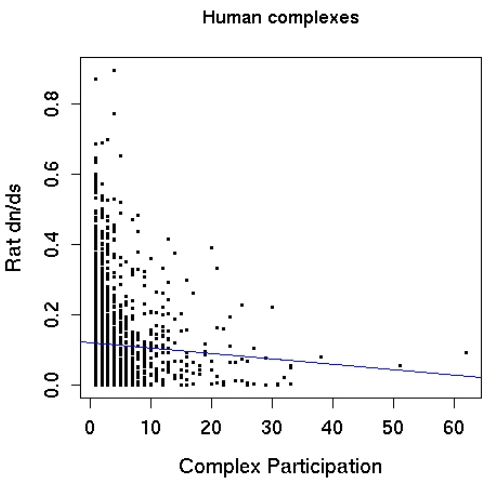
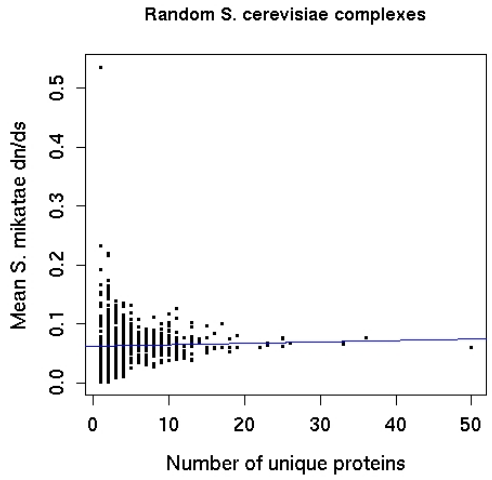


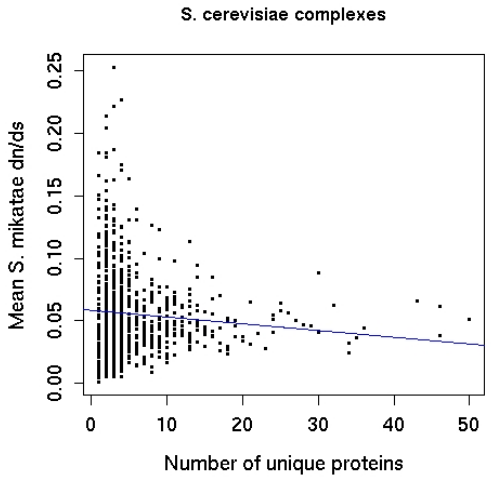

**Figure S10c - Complexes and Selection.** B) The mean dN/dS ratio for human-rat orthologs is plotted against the number of unique proteins for each complex. Complexes with more unique proteins tend to have significantly smaller mean dN/dS ratios than those with less unique proteins (t-test: $P < 0.002$). D) The dN/dS ratio for human-rat orthologs is plotted against the number of complexes they participate in. Proteins participating in more complexes have significantly lower dN/dS ratios than those with less complex participation (t-test: $P < 2.1 \times 10^{-5}$). A,C) Such trends were not observed in model 1 random complexes.

## Complexes and dN/dS (S. cerevisiae-S.mikatae Orthologs)

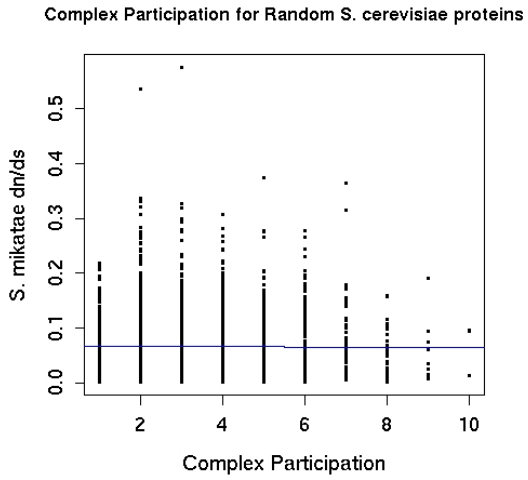
A




B




C




D

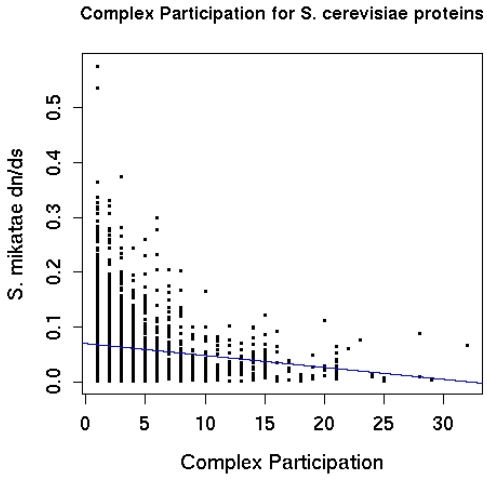
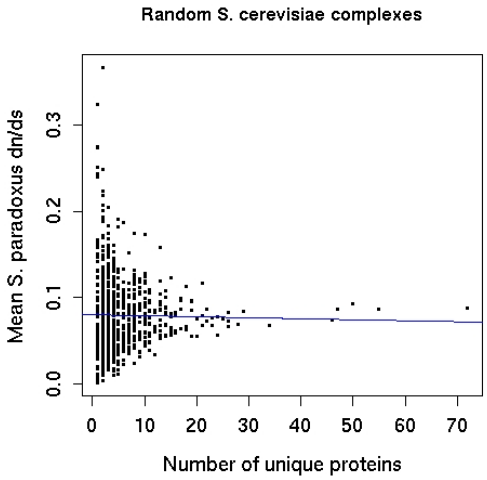


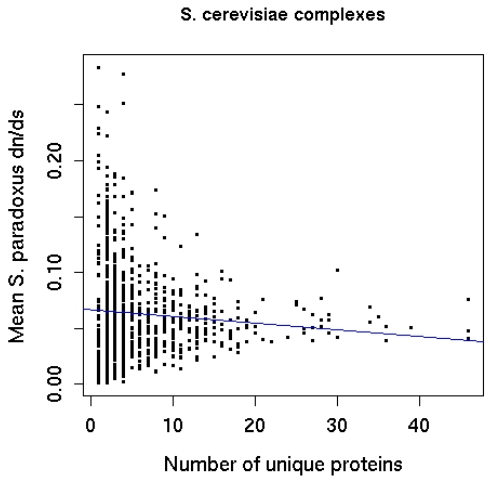

**Figure S10d - Complexes and Selection on Yeast Genes.** B) The mean dN/dS ratio for S. cerevisiae-S. mikatae orthologs is plotted against the number of unique proteins for each yeast complex. Complexes with more unique proteins tend to have significantly smaller mean dN/dS ratios than those with less unique proteins (t-test: $P < 0.001$). D) The dN/dS ratios for S. cerevisiae-S. mikatae orthologs are plotted against the number of complexes they participate in. Proteins participating in more complexes have significantly lower dN/dS ratios than those with less complex participation (t-test: $P < 2 \times 10^{-16}$). A,C) Such trends were not observed in model 1 random complexes.

## Complexes & dN/dS (S.cerevisiae-S.paradoxus Orthologs)

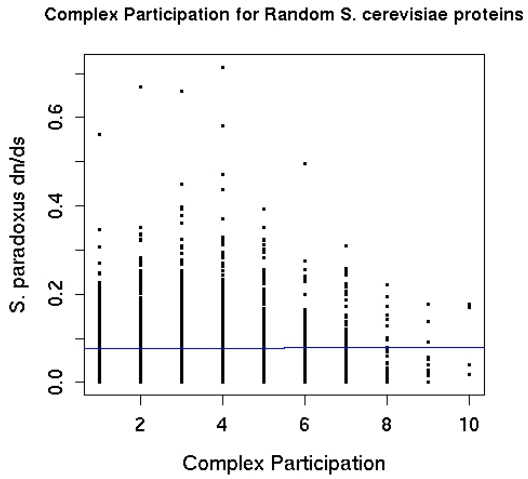
A




B




C




D

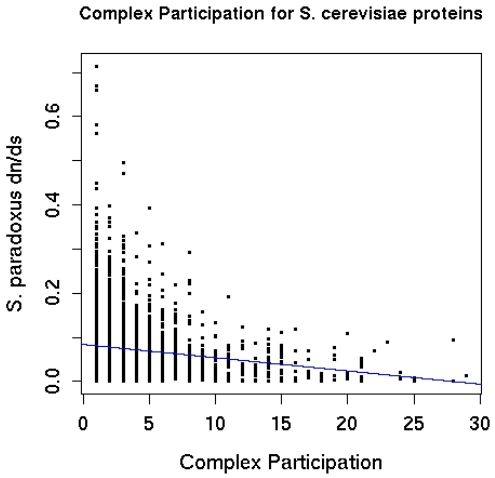



**Figure S10e - Complexes and Selection on Yeast Genes.** B) The mean dN/dS ratio for S. cerevisiae-S. paradoxus orthologs is plotted against the number of unique proteins for each yeast complex. Complexes with more unique proteins tend to have significantly smaller mean dN/dS ratios than those with less unique proteins (t-test: $P < 0.002$). D) The dN/dS ratios for S. cerevisiae-S. paradoxus orthologs are plotted against the number of complexes they participate in. Proteins participating in more complexes have significantly lower dN/dS ratios than those with less complex participation (t-test: $P < 2 \times 10^{-16}$). A,C) Such trends were not observed in model 1 random complexes.