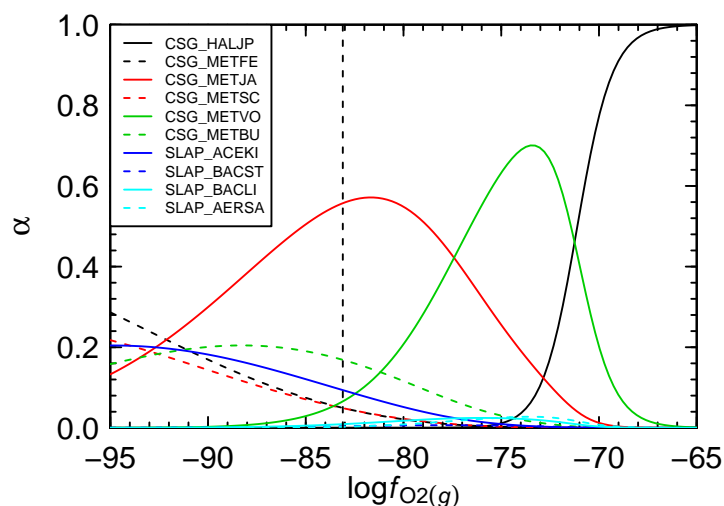Additional File 2

Calculated degrees of formation of ten surface-layer proteins as a function of $\log f_{O_{2(g)}}$ at 25 °C and 1 bar (see text for activities of basis species used). The vertical dashed line denotes the lower (reducing) stability limit of H_2O. The figure was created in CHNOSZ using the following commands:

```
# open plot file
thermo.postscript("alpha.ps")
# set sizes, margins, background color
par(cex=2,lwd=2,mar=c(3,3,1,1),bg="white")
# define basis species
basis("CHNOS+")
# load proteins
species(c("CSG_HALJP","CSG_METFE","CSG_METJA",
   "CSG_METSC","CSG_METVO","CSG_METBU",
   "SLAP_ACEKI","SLAP_BACST","SLAP_BACLI","SLAP_AERSA"))
# calculate affinities of formation reactions
a <- affinity(O2=c(-95,-65))
# plot metastability diagram with options for line
# type, color, and legend
diagram(a,residue=TRUE,alpha=TRUE,lty=rep(c(1,2),5),
   color=rep(palette()[1:5],each=2),
   legend.x="topleft",cex.names=0.5)
# plot water line
s <- subcrt(c("H2O","O2","H2"),c(-1,0.5,1),T=25)
abline(v=2*s$out$logK,lty=2)
# close plot file
dev.off()
```