Figure 3
TNFα/NF-κB Signaling Pathway. The TNFα/NF-κB signaling pathway. (a) The network. (b) The Tree of Complexes representation. The flow of action is visually represented by background colors: green for activators (IKKs) and yellow for inhibitors (IκBs, and p100). The NIK kinase is in the first functional group (A), together with all three members of the IKK complex and p100. Functional group B includes, in addition to p100, the IKKs and two inhibitors IκBα and IκBβ. This group is the beginning of interaction between IKKs and IκBs. Functional group C loses some of the IKKs, continues to show IκB and begins to show interaction between IκBs and NF-κB factors. Finally, in group E we see the entrance of NIK-independent Col-Tpl2 kinase.

nected to either *D* or *C*. The representation that maximizes the number of leaves is shown in Figure 3(b). One can clearly see the interplay between the activators and inhibitors. Proteins p105 and NF-κB participate in the same functional groups and thus follow the same path in the tree. The same is true for the pair of proteins IkBα and IkBβ. The Tree of Complexes captures this by grouping p105 and NF-κB, and IkBα and IkBβ.

Pheromone signaling pathway
The yeast *Saccharomyces cerevisiae* may be present in one of two haploid cell types, which are able to mate. Pheromones released by one type of cell bind to a specific receptor

of the other type. This triggers the activation of a scaffold protein-bound mitogen-activated protein kinase (MAPK) cascade and subsequent activation of nuclear proteins that control subsequent cellular events. In a recent paper, Spirin *et al.* [13] identified a subnetwork of proteins involved in this process within a yeast protein interaction network [21]. We analyzed this subnetwork using the COD to see if our method can extract elements of temporal ordering. The subnetwork identified by Spirin *et al.* and its Tree of Complexes representation is given in Figure 4. In this case, the protein network is not chordal. First, the COD method identifies and connects a pair of weak siblings, *MKKl* and *MKK2* .Then, to transform the network to a chordal graph,