

# Supplemental Materials

*Molecular Biology of the Cell*

Niepel et al.

## **Supplemental material for:**

### **The nuclear basket proteins Mlp1p and Mlp2p are part of a dynamic interactome including Esc1p and the proteasome**

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## Supplemental Table

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**Table S2.** Proteins identified in gels shown in Figure 1C, 1D and 1E.

**Table S3.** Proteins identified in gels shown in Figure 2A.

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## Supplemental Videos

**Video S1.** Movie of a FRAP experiment of Nup49p-GFP in a *wild type* strain.

**Video S2.** Movie of a FRAP experiment of Nup49p-GFP in *mlp1Δmlp2Δ* strain.

**Video S3.** Movie of a FRAP experiment of Nup49p-GFP in *mlp1Δmlp2Δ* strain.

**Video S4.** Movie of a FRAP experiment of Nup49p-GFP in *mlp1Δmlp2Δ* strain.

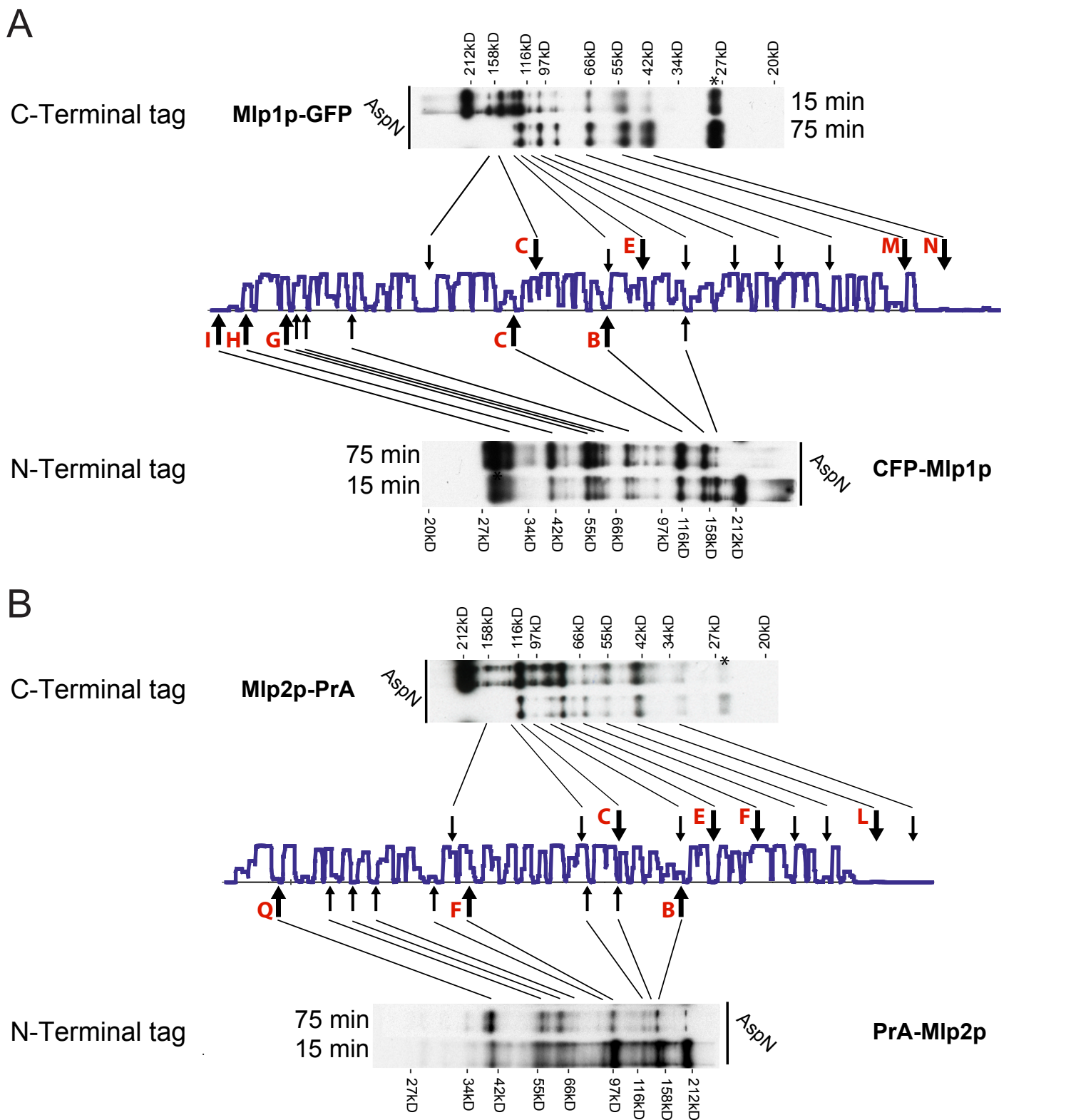
**Video S5.** Movie of a FRAP experiment of Mlp1p-GFP/Mlp2p-GFP in *wild type* strain.

## Supplemental references

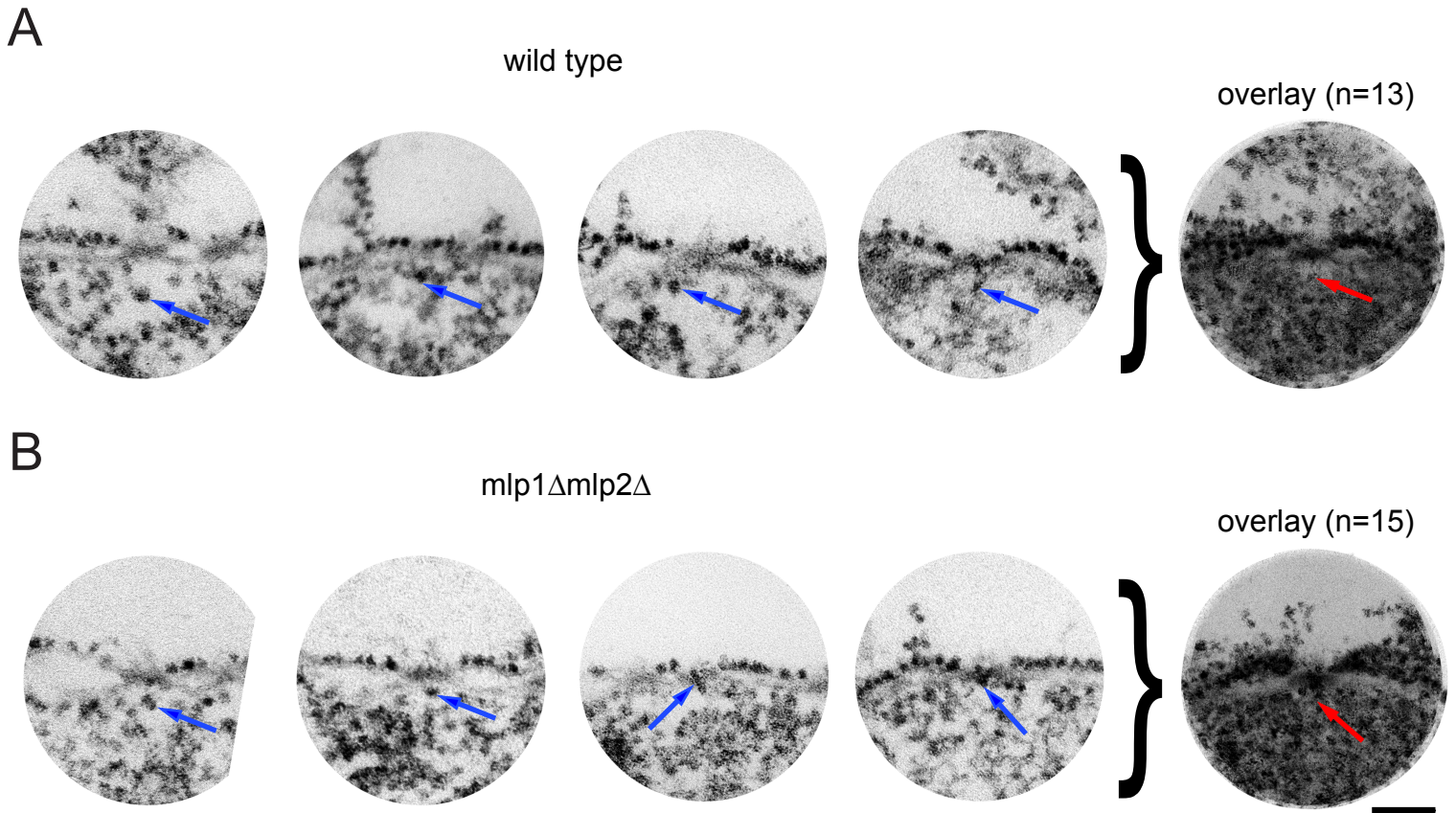
(References associated with Table S7)

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**Figure S1.** The coiled-coil region of both Mlp proteins contains multiple discontinuities and protease sensitive regions. Protease accessibility laddering (PAL) of (A) Mlp1p and (B) Mlp2p shows that sites of AspN protease cleavage, indicated above and below PAGE panels (vertical arrows), correspond to PARCOIL-predicted discontinuities in coiled-coil formation as calculated using 14-aa sliding windows. Arrow sizes represent relative degrees of protease sensitivity at the indicated sites, measured by quantifying the band intensity of individual protease fragments. The complete list of the AspN protease fragments with the corresponding estimated molecular weights and cleavage sites is listed in Table S6. Labels on the arrows correspond to labels in Table S6.



**Figure S2.** The nuclear basket keeps the central NPC transporter clear of RNA-rich electron-dense particles. (Left panels) Bernhard's EDTA-stained thin-section electron micrographs of four NPCs showing electron-dense RNA-rich particles (blue arrows), docking at or traversing through NPCs in (A) wild type and (B) *mlp1Δmlp2Δ* cells. In wild type cells, electron-dense particles are found near the distal ring at the nuclear basket. In *mlp1Δmlp2Δ* cells the particles appear to be closer to if not overlapping with the the NPC central tube. (Right panels) Overlays of multiple Bernhard's EDTA-stained images show that in *mlp1Δmlp2Δ* cells the nuclear face of NPCs appear to be significantly more crowded with RNA-containing electron-dense material than in wild type cells (red arrows). Bar: 100 nm.

Supplemental Table 1 - Proteins identified in gels shown in Figure 1A and 1B.

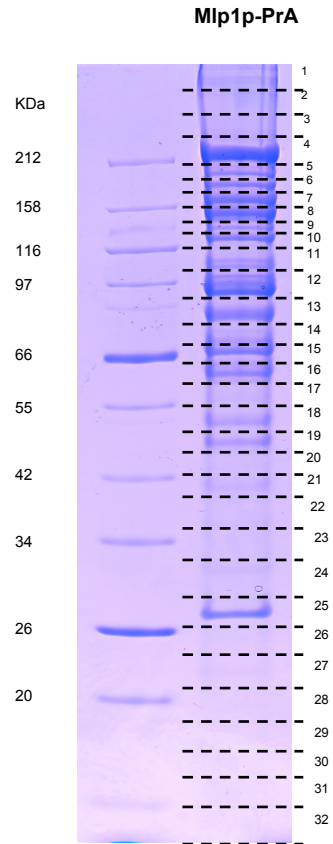
Bait	Target	Target (Systematic)	MS/MS score	NaCl Concentration	Extraction Buffer
Mlp1-PrA	Kap60	YNL189W	10-3	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Kap60	YNL189W	10-13	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Kap95	YLR347C	2.9*10-2	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Mex67	YGL169C	10-11	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Mex67	YPL169C	4.4*10-2	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Mlp1	YKR095W	10-2	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Mlp2	YIL149C	10-5	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nic96	YFR002W	10-6	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nsp1	YIL041W	10-8	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup133	YKR082W	10-8	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup145C	YGL092W	10-4	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup159	YIL115C	10-8	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup170	YBL079W	10-5	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup188	YML103C	10-3	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup192	YIL039C	10-14	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup2	YLR335W	10-4	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup53	YMR153W	10-3	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup60	YAR002W	10-5	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup82	YJL061W	10-7	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup84	YDL116W	10-6	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup85	YJR042W	10-16	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Pdc1	YLR044C	10-4	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Pgk1	YCR012W	10-10	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Rps1a	YLR441C	10-3	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Seh1	YGL100W	10-11	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Ssa1	YAL005C	10-7	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Ssb1	YDL229W	10-10	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Tef1	YPR080W	10-3	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Yef3	YLR249W	10-2	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Yra1	YDR381W	10-10	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Eno1	YGR254W	10-11	100 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Eno1	YGR254W	10-5	100 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Eno2	YHR174W	10-12	100 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Eno2	YHR174W	10-4	100 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Tef2	YBR118W	10-2	100 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Mlp2	YIL149C	10-2	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nic96	YFR002W	10-6	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nsp1	YIL041W	10-38	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup116	YMR047C	10-8	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup120	YKL057C	10-9	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup133	YKR082W	10-12	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup145	YGL092W	10-7	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup159	YIL115C	10-16	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup170	YBL079W	10-7	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup192	YIL039C	10-7	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup2	YLR335W	10-15	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup53	YMR153W	10-4	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup57	YGR119C	8*10-2	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup82	YJL061W	10-6	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup84	YDL116W	10-5	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Nup85	YJR042W	10-6	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Sac3p	YDR159W	10-8	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Seh1	YGL100W	10-7	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Yra1	YDR381W	10-3	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Kap60	YPL169C	10-2	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Kap60	YPL169C	10-7	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Mex67	YPL169C	10-8	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Mex67	YPL169C	10-6	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Mlp1	YKR095W	10-7	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Mlp1	YKR095W	0.08	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Mlp1	YKR095W	10-2	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Mlp1	YKR095W	10-2	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp1-PrA	Mlp1	YKR095W	10-2	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF

Bait	Target	Target (Systematic)	MS/MS score	NaCl Concentration	Extraction Buffer
Mlp2-PrA	Dbp3	YGL078C	10-2	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Etf2	YDR385W	10-6	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Fpr3	YML074C	10-3	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Kap60	YPL169C	10-3	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Mex67	YPL169C	10-4	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Nic96	YFR002W	10-3	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Nop58	YOR310C	10-6	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Nup82	YJL061W	10-3	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Nup84	YDL116W	10-5	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Pdc1	YLR044C	10-4	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Plk1	YGR240C	10-2	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Rpl2b	YIL018w	10-3	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Rps1b	YML063W	10-8	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Rps5	YJR123W	10-4	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Ssa2	YLL024C	10-9	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Ssa2	YLL024C	10-2	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Ssb1	YDL229W	10-10	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Yef3	YLR249W	10-3	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Yra1	YDR381W	7.6X10-8	0 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Act1	YFL039C	10-5	100 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Adh1	YOL086C	10-7	100 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Fba1	YKL060C	10-4	100 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Pdc1	YLR044C	10-2	100 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Psa1	YDL055C	10-2	100 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Seh1	YGL100W	10-7	100 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Tdh1	YJL052W	10-4	100 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Tdh3	YGR192C	10-10	100 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Tef2	YBR118W	10-4	100 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Bfa1	YJR053W	10-2	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Mlp2	Yil149c	10-2	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Mlp2	Yil149c	10-2	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Mlp2	YIL149C	10-5	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Mlp2	Yil149c	10-5	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Nic96	YFR002W	10-5	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Nsp1	YJL041W	10-29	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Nup1	YOR098C	10-5	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Nup133	YKR082W	10-6	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Nup188	YML103C	10-2	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Nup192	YJL039C	10-3	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Sac3p	YDR159W	10-3	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Spc110	Ydr356w	10-9	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Spc110	YDR356W	10-8	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Tsa1	YML028W	10-5	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Yki056c	Yki056c	10-2	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Yki171w	Yki171w	10-2	150 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Cdc31	YOR257W	10-11	200 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Nsp1	YJL041W	10-3	200 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Nup188	YML103C	10-3	200 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Nup192	YJL039C	10-4	200 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF
Mlp2-PrA	Pom152	YMR129W	10-9	200 mM	20 mM Na-Hepes, pH 7.4, 0.5 % Triton-X-100, 1 mM DTT, 4 g/ml pepstatin, 0.2 mg/ml PMSF

Supplemental Table 2 - Proteins identified in gels shown in Figure 1C, 1D, and 1E

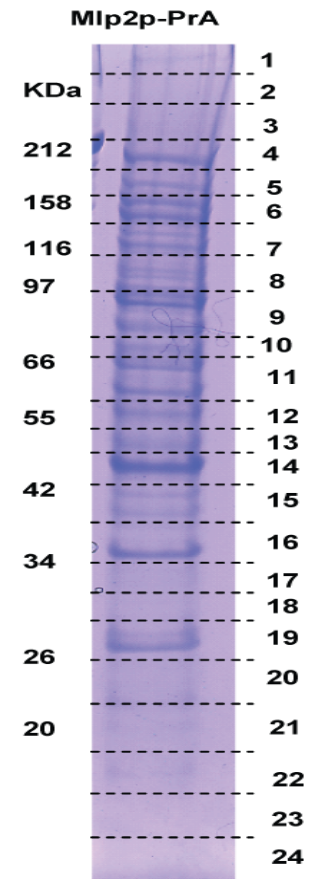
**Mlp1p-PrA**

Band	NCBI-GI	NAME	MS (nr. peptides)	Sequence coverage (%)	MS score
1	6322948	Mlp1p	66	40	39.5
2	171959	Mlp1p	48	33	19.3
3	171959	Mlp1p	51	32	23.4
	6323875	Ese1	23	17	9.1
4	172170	photolyase	14	31	1.7
	171959	Mlp1p	72	40	36.4
5	6322948	Mlp1p	45	25	15.9
	6322042	Mlp2p	41	28	14
6	6322076	Nup159p	45	46	37.1
7	6323533	Nup188p	35	24	19.5
	6322421	Nup192p	33	22	19
8	6323777	Pom152p	34	32	18.8
	6320952	Nup157p	32	31	17.8
	6319392	Nup170p	25	20	13
	6320363	Sac3p	24	22	8
	6322421	Nup192p	16	9	4.3
9	6323533	Nup188p	16	12	1.7
	6324672	Nup1p	21	26	25.2
	6322935	Nup133p	26	20	23.4
10	6323691	Nup116	7	9	1.9
	6322935	Nup133	28	24	22.5
11	6323691	Nup116	14	16	7.4
	6322793	Nup120p	23	20	23.3
12	6322782	Nup100p	9	15	8
	14318524	Nie96	33	37	47.7
	6322420	Nsp1	29	48	40.2
	6323367	Nup2	18	38	24
13	6323379	Kap95	9	13	11.9
	14318558	Qcr6	4	43	3.2
	6321346	Nup145C	23	18	13.6
14	6320087	Nup84	17	28	12
	6322502	Nup85	16	24	11.6
	172054	Nsp1	17	32	9.7
	6322400	Nup82	15	24	6.1
15	6319318	Nup60p	13	36	4.6
	6321346	Nup145N	13	12	4
16	6325088	Mex67p	14	31	24.3
	6319318	Nup60p	13	31	15.2
	732941	Asm4	5	10	6.8
17	1945327	Nup57	9	16	6.4
	58177142	Kap60	10	23	5.3
	6320115	Asm4	8	22	4
18	6322815	Ugp1p	8	18	4.1
	6324620	Dbp5p	7	18	2.5
19	6321266	Nup49	9	17	9.5
	32693293	Tef1	9	33	6.1
20	32693293	Tef1	11	27	11.5
	6324500	Thp1p	10	23	11
	6320137	Ildp1p	7	15	3.2
21	6321338	Sch1p	9	25	10.2
	6320954	Gle2p	5	19	4
22	49258842	DchamD sordarin	6	28	6.5
	50882584	Yhr131cp	6	9	4
23	6321631	Tdh3	10	32	7.9
	45269784	YLR018C	5	20	3.8
24	6323237	Sec13p	15	43	18.6
25	6320589	Yra1p	7	25	7.1
26	6325058	Rpl7bp	4	16	1
27	1370295	glutamate synthase	9	4	2.4
28	110590423	Cdc31	5	24	4.8
	110590423	Cdc31	8	35	16.9
29	6320918	Rps24ap	8	41	13.9
	49258832	MchainM sordarin	5	36	6.6
	49258830	KchainK sordarin	6	38	5.6
	171031	histone H2A-1	3	33	2.9
30	6319424	Ede1p	8	4	8.4
31	6324485	YOL087cp	4	5	1.9
32	6320632	Dyn2p	4	44	2.1



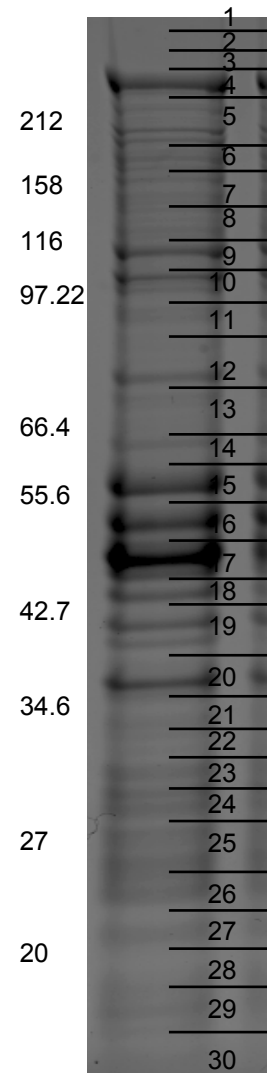
**Mlp2p-PrA**

Band	NCBI-GI	NAME	MS (nr. peptides)	Sequence coverage (%)	MS score
1	6322042	Mlp2	8	7	7.2
2	6319317	Tfc3p	3	1	2.3
3	6322042	Mlp2	16	13	7.6
	6320952	Nup157	11	11	3.3
4	6322042	Mlp2p	44	29	24.7
	6322421	Nup192p	15	11	4.2
	6322076	Nup159p	27	32	17
6		N/A			
7	6320952	Nup157p	21	22	10
	6323777	Pom152p	20	20	10.5
	6322935	Nup133p	19	22	12.7
8	6322793	Nup120p	15	14	8.3
	395232	Nic96p	21	31	19.4
	6323367	Nup2p	19	47	15.3
	6322177	Pdr11	15	10	4.3
	55670150	A chain A	10	19	2.6
	6319594	Tef2	8	29	1.9
9	395232	Nic96p	15	23	13.2
	172054	Nsp1p	14	31	9.5
	6322502	Nup85p	12	17	5.1
10	496731	Nup145C	12	11	4.4
	6323004	Ssa1	14	33	5.9
	6325088	Mex67	10	31	2.2
11	6325088	Mex67p	12	25	10
	732941	Nup59p	10	28	8.3
	6319972	Ssb1	9	21	6.6
	7546348	A Chain A	7	32	5.5
	6323073	Pdc1	8	23	5.3
	6322744	Ykl105cp	12	11	5
12	6319279	Cdc19p	8	18	5.6
13	7839210	Ypr158c-cp	5	21	0.5
14	230846	Enolase	7	27	3.2
	6319594	Tef2p	5	20	2.4
15	6322381	Scp160p	8	6	1.7
16	4109	Pdc1p	7	25	7.1
	112491285	Adh1p	5	26	5.1
	6321631	Tdh3p	9	55	13
17	6319441	Pet9	4	12	3.1
	55670021	Rack1	5	38	4.7
	6325126	Rpl5	6	27	5.4
	6323371	Rpp0p	9	32	12.1
18	6323237	Sec13p	7	39	6.7
	6321997	Rps4bp	5	29	4.2
19	2624630	PG mutase	6	44	5.1
	6325058	Rpl7bp	6	37	4.8
20	6323104	Rpl10p	6	25	1.9
21	1164943	YOR3177w	5	41	3.2
	6320562	Spe110	9	11	6.1
22	6323863	hfa1p	5	4	0.7
23	6323915	Ymr259cp	11	15	2.4
24	71081935	TAO3p	8	4	2.9



**Esc1p-PrA**

Band	NCBI-GI	NAME	MS (nr. peptides)	Sequence coverage (%)	MS score
1	6323462	Sen1p	12	7	0.8
	6322042	Mlp2p	24	14	10
2	224905	ATPase	11	16	7
	6323875	Esc1p	11	8	4.7
3	6323875	Esc1p	32	30	35.4
	6321430	Pma1p	10	16	9.8
	6323628	Sel1p	5	7	2.7
4	6323875	Esc1p	47	40	49.1
	6321757	Ecm29p	41	27	23.8
5	6322042	Mlp2p	38	26	15
	6323875	Esc1p	33	28	15.3
	854566	carbamy1 p.s.	24	13	2
	6322421	Nup192p	19	10	5.3
6	6320433	Sir4p	19	18	6.8
	6323875	Esc1p	17	16.2	6.1
	7839207	Ypr137c-bp	18	15	6
	6323875	Esc1p	20	16	10.4
7	6322163	Irr1p	12	17	3.8
	1360355	TY1B	15	9	2.1
	119180	EF-3A	17	22	9.7
8	4246	PSE-1	11	18	4
	51013765	YLR442C	11	14	3.3
	887600	unknown	12	18	3.3
	6321816	Rpn1p	30	39	34.8
9	4246	PSE-1	12	18	8.1
	6319558	Mis1p	11	20	6.9
	6321643	Ade1p	11	21	5.1
	6322115	Rpn2p	36	45	34.8
10	55670150	A Chain A	19	31	13.4
	6323606	Amd1p	15	29	11.2
	171723	hsc82	14	23	9.4
	6322420	Nsp1p	11	24	7.6
11	6320936	Met6p	13	17	5.2
	71064052	Rom1p	8	15	1.9
	417149	SSA1	19	47	19.7
12	6322771	Smy1p	10	20	4
	6319972	Ssb1p	18	40	22.3
13	6323004	Ssa2p	8	15	9.3
	6324778	Ded1p	5	16	3.6
	6323073	Pdc1p	18	51	20.2
14	6319279	Cdc19p	12	25	10.4
	171122	vacuole H AIPase	9	25	2.4
	110282990	RPN3	19	41	17.7
	6322734	Rpt1p	14	29	10.9
15	6322815	Ugp1p	13	35	6.1
	6319279	Cdc19p	11	24	5.9
	15826394	Lipo Dehydrogenase	11	32	4.6
	6324258	Lat1p	9	25	3
	6320602	Rpt3p	17	63	17.3
	6324691	Rpt5p	15	47	11.4
16	557599	ATPase	13	43	8.4
	6319594	Tef2p	15	48	8.8
	6320054	Rpn3p	14	37	6.2
	6323087	Shm2p	10	32	2.1
	1147800	Sug2p	11	39	4.3
	6319594	Tef2p	18	48	18.5
	6320137	Idp1p	17	60	21.5
17	228885	SUG1	13	29	13.1
	1633520	PG Kinase	10	37	6.9
	6321968	Eno2p	11	31	6.4
	6325365	Rpn7p	10	29	9.7
	6320106	Rpn6p	8	32	3
	37362644	Pda1p	20	57	31.9
	49258841	C Chain C...	13	31	13.2
18	6320635	Rpn9p	9	31	13.2
	228885	SUG1	7	22	5.2
	6324835	Rpn8p	7	38	3.8
	1633520	PG Kinase	6	27	2.7
	6320635	Rpn9p	16	46	21.7
19	6324321	Sis1p	9	37	13
	49258842	D Chain D...	9	37	10.4
	6324835	Rpn8p	10	49	12.7
	6322790	Fba1p	9	33	6.7
	31581432	actin	6	35	5.6
	3720	G3PD	5	28	3.1
	957238	Ilv5x	6	24	2.3
	6319698	Pdb1p	15	69	25.3
20	6321631	Tdh3p	15	55	19.8
	112491285	YAD I	11	49	14
	14318526	Rpn11p	11	36	13.5
	6321216	Ede1p	6	35	3.4
	55670021	Rack1	12	72	14.2
21	14318526	Rpn11p	11	35	10.6
	6323371	Rpp0p	9	37	8.9
	6325126	Rpl5p	8	47	5.9
	13787035	Pyrophosphatase	9	43	4





22	6321994	Rpn10p	11	61	19.9
	14318577	Rpn12p	10	45	14.8
	6319441	Pet9p	8	24	7
	6322537	Mir1p	5	15	3.8
23	6323577	Rps1bp	15	48	12.2
	6321997	Rps4bp	12	39	9
	14318577	Rpn12p	10	50	5.1
	49258840	B Chain B	11	49	4.6
	172444	ribo L4	9	34	2.4
24	2624630	phosphoglycerate mutase	8	41	18
	3114269	AchA 20S proteasome	9	41	14.5
	49258840	BchB ribo	9	33	11.9
	6323077	Rps0bp	6	44	9
	49258844	FchF Ribo	6	25	8.8
	230405	isomerase	4	18	3.7
3114271	CchC 20S proteasome	4	26	2.7	
26	6323567	Rpl6ap	9	46	6
	49258852	NchN ribo	9	50	5.2
	6324670	Rps7ap	7	49	3.9
25	3114269	A Chain A 20S	10	41	17.8
	2624630	A Chain A PGM	8	41	18
	6324151	Rps3p	9	47	16.1
	6321653	Rps0ap	6	44	8.9
	49258844	F Chain F ribo	6	25	8.8
	49258840	B Chain B ribo	6	33	8.2
	230405	isomerase	4	18	3.7
	3114271	C Chain C 20S	4	26	2.6
27	6324888	Rpl20bp	11	47	12.7
	3114271	Tsa1p	8	43	5.2
	3114271	Ahp1p	5	42	3.4
28	71081919	TAO3p	14	6	1.3
29	6320658	Rps18ap	7	52	7.7
	6321786	Rpl14bp	8	35	6
	6320269	Rps13p	6	41	5.5
	6320679	Rpl27bp	6	35	5.1
	6321772	Rps20p	5	45	3.1
	6320655	Rps17bp	5	31	2.6
30	547604	rp59	10	63	12.4
	6320918	rps24ap	6	35	2.2

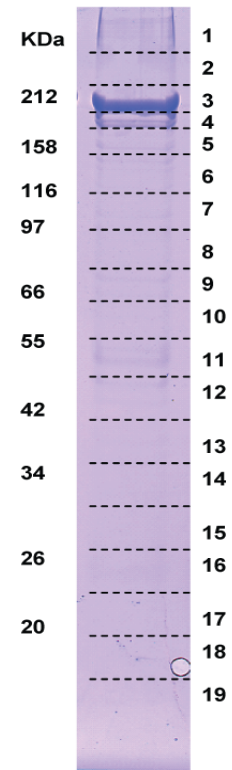


Supplemental Table 3 - Proteins identified in gels shown in Figure 2A

**Mlp1p-PrA, nup84Δ**

Band	NCBI-GI	NAME	MS (nr. peptides)	Sequence coverage (%)	Xproteo score
1	171959	Mlp1p	25	16.3	28.9
2	171959	Mlp1p	39	28	46.2
3	6322948	Mlp1p	50	29	60.1
4	171959	Mlp1p	54	33	55.1
5	171959	Mlp1p	40	28	32.4
6	6322042	Mlp2p	23	21	8.8
7	171959	Mlp1p	19	14	23.5
8	171959	Mlp1p	23	16	18.6
9	395232	Nic96p	8	12	7.2
10	171959	Mlp1p	8	4	2
11	417149	Ssa1p	11	20	16.2
12	6325088	Mex67p	5	16	5.1
13	6324804	Wtm1p	12	42	9
14	6319594	Tef2p	12	35	14.6
15	6322434	Rnr2p	8	28	9.8
16	6321619	Rnr4p	10	34	12.4
17	3328	actin	4	18	2.8
18	83137	acetolactate synth	4	33	2.1
19	6320589	Yra1p	9	21	10.1
20	6321919	Yhr127wp	4	17	4
21	472525	Synthetic Lethal 9	9	9	4.1
22	1209387	GDP-GTP exchange protein	3	3	0.8
23	2131277	Hfim1p	5	8	3.2
24	6322590	Str2p	3	6	3.3
25	2447041	Ppf3p	10	8	2.4

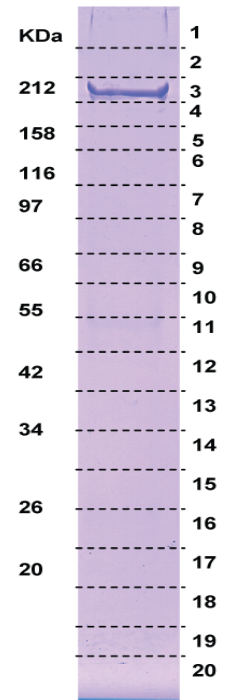
**Mlp1p-PrA; Δnup84p**



**Mlp1p-PrA, nup60Δ**

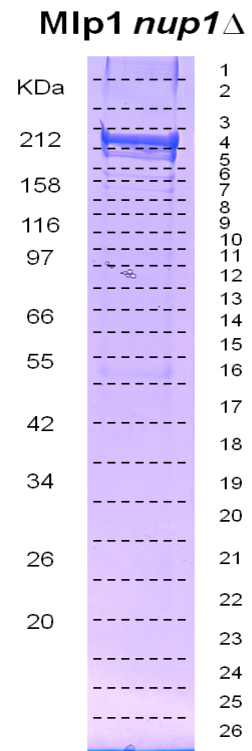
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1	6322948	Mlp1p	15	9	9.9
2	171959	Mlp1p	7	5	6.3
3	6322948	Mlp1p	11	10	10.4
4					
5	6322190	Yil001wp	3	7.4	3.9
6					
7	6319317	Tfc3p	2	1.4	0.2
8	171959	Mlp1p	10	7.1	1.9
9					
10	171959	Mlp1	21	8	1.8
11	71064089	tao3p	5	2.9	1
12	472525	synth lethal 39	9	6.6	1.4
13	6322500	gef1p	3	6.5	1.9
14	6324820	yor246cp	4	19	0.4
15	6322392	utp18p	4	14	1.3
16	6320979	pmd1p	8	8	4.8
17					
18	6323933	fcplp	3	8	1.9
19	6324022	mck1p	3	14	1.9
20	6320337	ydr132cp	2	10	0.8

**Mlp1p-PrA; Δnup60p**



**Mlp1p-PrA, nup1Δ**

Band	NCBI-GI	NAME	MS (nr. peptides)	Sequence coverage (%)	Xproteo score
1	171959	Mlp1	22	14	12.5
2	171959	Mlp1	18	10	10.7
3	171959	Mlp1	11	7	5.5
4	171959	Mlp1	26	14	18.5
	71064042	Rsc1	9	10	2.6
5	171959	Mlp1	56	25	28.8
6	171959	Mlp1	30	18	15.7
7	171959	Mlp1	11	6	11.8
8	171959	Mlp1	16	8	2.4
9	171959	Mlp1	11	6	4.9
10	171959	Mlp1	12	7	4.8
11	171959	Mlp1	7	4	2.2
12	171959	Mlp1	14	7	2.6
13	171959	Mlp1	12	7	2.7
14	171959	Mlp1	11	5	4.1
15	6320243	Ena5	5	5	1.7
16	6320087	Nup84	14	26	11
	6322400	Nup82	13	23	8.7
	172054	Nsp1	11	17	7
	6321346	Nup145	14	13	6.1
	1019944	Nup85	8	12	2.3
17	6324310	YNL018C	3	9	0.8
18					
19	6320589	Yra1	3	15	1.7
20	6320979	Pmd1	8	7	1.8
21	6322966	Mht1	2	7	6.6
22	33578048	YKL068-ap	1	18	5.5
23	47169395	Acetyl CoA carboxylase	5	8	4.1
24	6320333	YDR128wp	5	6	1.4
25	6320979	Pmd1	5	5	2.5
26	6320979	Pmd1	3	3	0.8

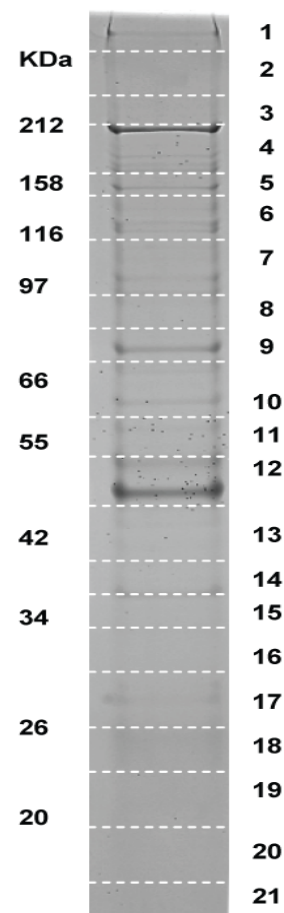


Supplemental Table 4 - Proteins identified in gels shown in Figure 2B

**Mlp2p-PrA, nup84Δ**

Band	NCBI-GI	NAME	MS (nr. peptides)	Sequence coverage (%)	Xproteo score
1	6322042	Mlp2	45	28	36.1
2	6322042	Mlp2	29	22	20.5
3	171959	Mlp1	6	5	4.2
4	6322042	Mlp2	7	10	5
5	854598	ORF YJR8318	1	6	3.4
6	114794808	EF3	5	11	2.1
7	14318524	Nic96	15	16	9.5
	6320593	Eft2	11	21	7.1
8	6322420	Nsp1	15	34	10.6
	171723	Hsc82	9	15	4.5
9	6323004	Ssa2	12	26	20.7
	6324120	Ssb2	10	22	15.5
	1301810	unknown	3	29	2.9
10	6323073	Pdc1	13	44	16
	6323226	Sik1	6	20	3.6
11	6319279	Cdc19	15	38	14.8
	171122	H+ ATPase	8	24	3.8
12	32693297	Tef1	12	37	14.5
	6321968	Eno2	8	33	5.4
13	1633520	PgkP72	14	50	9.3
	32693297	Tef1	10	32	5.1
14	49258842	DchainD RiboEef2Sordarin	7	32	7.8
	6321631	Tdh3	9	55	10.1
15	112491285	Yeast Alcohol Dehydrogenase	8	28	8.3
	6323371	Rpp0	6	19	2.2
16	596086	YL6b	4	38	5.1
	6321997	Rps4bp	3	12	2.9
17	2624630	PG Mutase	12	48	13.2
	6322583	Rps5p	7	34	2.1
18	1084771	L18a.e.c13	8	38	1.2
19	6320679	Rp127bp	3	23	3
	6320269	Rps13p	3	20	2.8
20	49258830	KchainK RiboEef2Sordarin	5	45	1.3
21	6321265	Kem1p	10	10	4.2

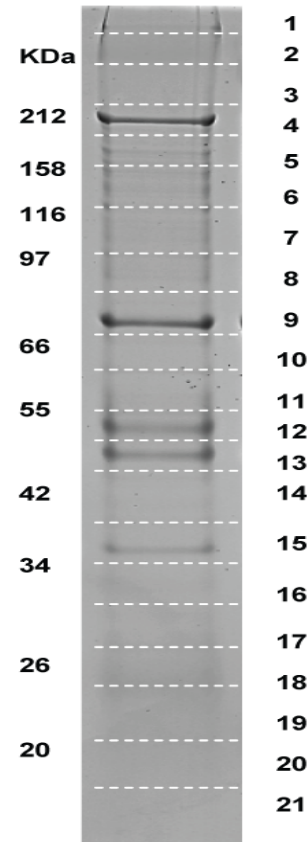
**Mlp2p-PrA; Δnup84p**



**Mlp2p-PrA, nup60Δ**

Band	NCBI-GI	NAME	MS (nr. peptides)	Sequence coverage (%)	Xproteo score
1	6322042	Mlp2	9	6	11.6
2	6322062	TAO3p	5	3	2.1
3	6321194	Tad3p	4	16	1.6
4	6322948	Mlp1	27	17	13.3
	6322042	Mlp2	22	18	11.4
5	6322042	Mlp2	17	17	13.9
	224905	ATPase	7	14	4.9
6	71081933	TAO3p	9	5	2.7
7	6321243	Gen1	11	5	1.7
8	42543756	A Chain α Hsp90/Aha1	6	13	2.9
9	6323004	Ssa2	6	17	7.4
10	6321631	Tdh3	4	25	1.4
11	6319279	Cdc19	6	12	2.2
12	6324804	Wtm1	4	11	1.4
13	6321968	Eno2	10	33	9
	6322434	Rnr2	9	26	9.1
	32693293	Tef1	7	27	6.3
	1633520	PG Kinase	6	22	3
14	6324280	Alg11	6	11	2.1
	49258842	D Chain D sordarin	6	30	6.1
15	3328	actin	5	22	3.6
	6322062	TAO3p	32	16	6.8
16	6323371	Rpp0p	8	29	7
17	2624630	A Ch A PG Mutase	6	22	8.8
18	6325172	Sec16	6	5	4
19	51013057	YHR158C	7	8	2.3
20	71081919	TAO3p	4	3	2.2
21	6321872	YHR080cp	4	5	2.1

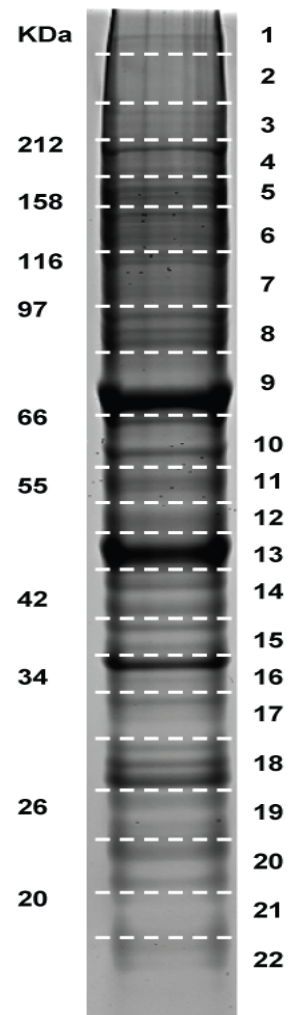
**Mlp2p-PrA; Δnup60p**



**Mlp2p-PrA, nup1Δ**

Band	NCBI-GI	NAME	MS (nr. peptides)	Sequence coverage (%)	Xproteo score
1	6322042	Mlp2	26	21	17.4
	6321430	Pma1	8	16	2.2
2	6322042	Mlp2	13	15	7.5
3	6322042	Mlp2	23	18	11.3
	6321430	ATPase	9	14	1.9
4	6322042	Mlp2	22	13	24.5
5	1945331	TY1B	15	9	5.9
	6320952	Nup157	9	10	3.4
	6319594	Tef2	7	14	2.1
6	114794808	Elongation factor	6	18	2.2
7	55670150	Ribosomal Translocase	13	20	15.3
	395232	Nic96	12	12	8
	32693293	Tef1	5	19	2.7
8	171723	Hsc82	16	25	10.7
9	6323004	Ssa2	13	30	6.9
10	6323073	Pdc1p	10	31	6.9
	6319972	Ssb1p	10	25	6.5
11	6319279	Cdc19	10	27	13.3
	6319673	Pgi1	5	20	2.5
12	32693293	Tef1	6	22	4.3
13	32693297	Tef1	16	45	23.9
	6321968	Eno2	13	56	17.7
	1633520	PG Kinase	7	27	6.1
	33357107	ATP Sulfurylase	9	15	5.2
14	6325086	Ove3	5	21	2.5
	71064089	TAO3p	16	7	0.7
15	6321631	Tdh3	11	59	9.2
	6323387	Ilv5	11	29	8.3
	49258842	Ribosomal D Ch D	8	35	3.5
	6319847	Cdc10p	7	42	2.1
16	6321631	Tdh3	11	54	14.4
	6323371	Rpp0	8	26	9.1
	112491285	Alcohol Dehydrogenase	7	21	7.1
	13787035	A Ch A	7	31	3.8
	6325126	Rpl5	6	40	3.4
17	2624630	PG Mutase	13	57	16.9
	6323077	Rps0bp	6	33	3.3
18	2624630	PG Mutase	12	52	16
19	1164943	YOR3177w	7	49	6.4
	6323104	Rpl10	7	34	4.1
20	6323613	Tsa1	10	59	6.4
	1084771	L18a.e.c13	7	33	3.4
21	6320269	Rps13	7	35	4.9
22	15988133	B Chain B, nucleosome	5	52	4.1
	49258862	W Chain W RiboEef2Sordarin	4	33	2.9

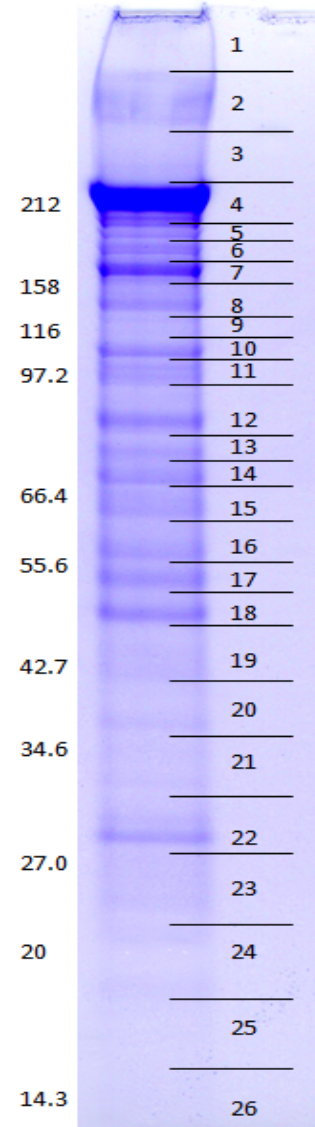
**Mlp2p-PrA; Δnup1p**



Supplemental Table 5 - Proteins identified in gels shown in Figure 2C

**Mlp1p-PrA, nup188Δ**

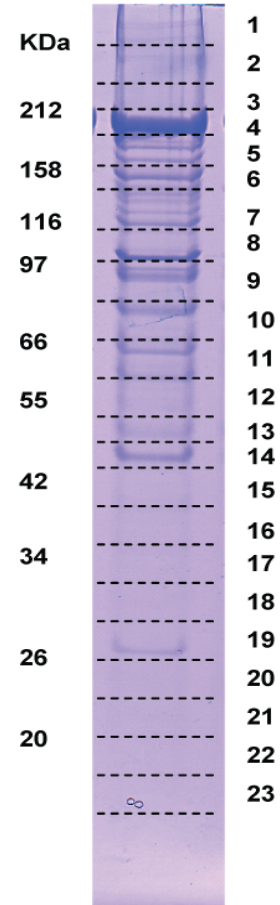
Band	NCBI-GI	NAME	MS (nr. peptides)	Sequence coverage (%)	Xproteo score
1	6322948	Mlp1	34	24	39
2	6322948	Mlp1	28	19	32.6
3	6322948	Mlp1	25	19	26
4	6322948	Mlp1	53	35	45.5
5	171959	Mlp1	28	19	17.9
	6322076	Nup159	25	27	16
6	6322421	Nup192	21	19	19.2
	171959	Mlp1	16	14	9
7	6323777	Pom152	25	22	18.9
	6319392	Nup170	21	14	14.8
	6320952	Nup157	21	19	11.6
	6320363	Sac3	15	16	6.4
	171959	Mlp1	12	9	4.1
8	6322935	Nup133	13	13	14.3
9	171959	Mlp1	19	14	12.3
	6322793	Nup120	9	10	5
10	6322793	Nup120	21	24	27.9
	172054	Nsp1	22	51	23.4
	6323367	Nup2	8	18	5.5
11	14318524	Nie96	17	26	14.6
	6323379	Kap95	13	20	12.6
	6323367	Nup2	13	26	10.4
12	6322502	Nup85	16	29	22.6
	6321346	Nup145C	16	14	16.4
	6320087	Nup84	13	25	14.1
	6322400	Nup82	8	13	5.4
13	417149	SSA1	15	29	24.3
	6325088	Mex67	6	18	6
	6319318	Nup60	6	18	4.4
14	6325088	Mex67	12	23	24.4
	454437	70 kDa heat shock protein	4	32	4.8
15	7546348	Kap alpha	7	25	11.7
	6322556	Yjr096wp	4	18	2.8
16	6322815	Ugp1p	15	40	12.4
17	171959	Mlp1	7	4	1.3
18	6324500	Thp1	12	30	15.5
	6319594	Tef2	10	29	11.3
19	6321338	Seh1	9	31	12.8
	49258841	CchC sordarin	7	14	2.9
20	112491285	Yeast Alcohol Dehydrogenase	8	33	5.9
	49258842	DchD sordarin	8	38	5
	6321631	Tdh3	8	49	3.5
21	6323237	Sec13	14	56	22.1
	6323371	Rpp0p	5	21	2.6
22	6320589	Yra1	9	34	14.7
	6321919	Yhr127wp	6	32	8.7
	596086	YL6b	5	38	4.7
	49258844	FchF sordarin	5	31	3.1
	49258822	BehB sordarin	4	34	2.9
23	49258854	PehP sordarin	5	33	4.4
	6322284	Rp117bp	5	35	3.5
24	110590423	Cdc31p	4	17	2.5
25	110590423	Cdc31	4	24	7
	49258830	KchK sordarin	4	34	5.6
26	6322035	Ubp7p	6	10	2.6



**Mlp1p-PrA, pom152Δ**

Band	NCBI-GI	NAME	MS (nr. peptides)	Sequence coverage (%)	Xproteo score
1	6322948	Mlp1	35	23	33
2	6322948	Mlp1	22	13	21.4
3	6322948	Mlp1	22	16	17.4
	6323875	Esc1	7	7	2.6
4	171959	Mlp1	51	28	48.6
5	6322076	Nup159	33	34	25
	6322948	Mlp1	23	15	11
	6322042	Mlp2	14	12	3.4
6	6322421	Nup192	23	16	17.6
	6319392	Nup170	25	19	16.5
	6323533	Nup188	15	14	7.9
7	6322935	Nup133	15	19	16.2
	6320952	Nup157	7	9	2.9
8	172054	Nsp1	13	28	15.3
9	14318524	Nie96	24	33	25.3
	67464126	Kap95	15	31	14.2
	172054	Nsp1	15	35	10.1
	6323367	Nup2	11	23	5.8
10	6320087	Nup84	16	31	17.5
	6321346	Nup145	17	12	15.8
	1019944	Nup85	16	26	12.8
	6323004	Ssa2	12	23	7.5
	6322400	Nup82	9	16	4.9
11	6325088	Mex67	13	37	18.2
	83754477	Kap60	7	23	5.1
12	6322815	Ugp1p	9	31	4.8
	6319279	Cdc19	10	29	3.5
13	6321266	Nup49	3	8	1.4
14	6319594	Ter2	10	25	9.3
15	6321338	Seh1	9	31	15.2
	6320954	Gle2	5	27	5.1
16	49258842	DChD sordarin	6	30	7.8
	6322411	Mtr4	9	10	6.9
	6321631	Tdh3	6	39	6.9
	6321338	Seh1	4	15	2.6
	6320954	Gle2	4	23	2.5
17	6323237	Sec13	7	39	4
	6323371	Rpp0	5	21	2.3
18	6323237	Sec13	3	19	2.8
	6320589	Yra1	6	29	5.9
19	2624630	AchA PG Mutase	7	44	5.2
	6325058	Rpl7bp	6	26	3.1
20	6320979	Pmd1	6	6	1.9
21	6325276	Cdc54	9	15	2.8
22	6324831	Cdc31	5	49	9.8
23	110590423	Cdc31	4	24	10

**Mlp1p-PrA; Δpom152p**

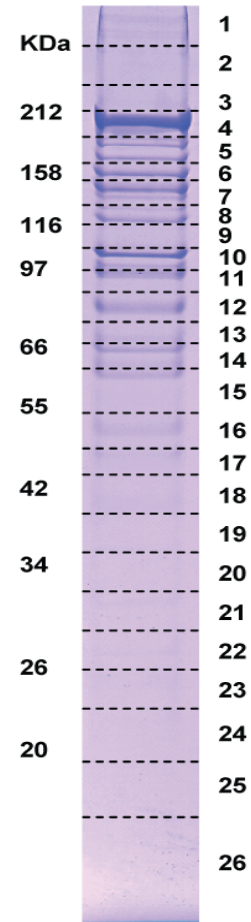




**Mlp1p-PrA, nup53Δ**

Band	NCBI-GI	NAME	MS (nr. peptides)	Sequence coverage (%)	Xproteo score
1	6322948	Mlp1	22	18	19.2
2	6322948	Mlp1	23	16	18.1
3	171959	Mlp1	11	8	7.6
4	6322948	Mlp1	33	22	34.1
5	6322076	Nup159	8	9	6.5
	6322948	Mlp1	7	7	3.3
6	6322421	Nup192	11	10	10.1
	6323533	Nup188	8	9	4.1
7	6323777	Pom152	12	15	14.1
	6320952	Nup157	6	8	3.6
8	6322935	Nup133	19	16	15.5
	6324672	Nup1	12	17	8.8
	6323691	Nup116	7	9	4.6
9	6322556	YJR096wp	3	10	1.2
10	172054	Nsp1	24	45	29.2
	4049	Nup2	8	16	7.7
	14318524	Nie96	7	14	6.2
	6322793	Nup120	7	10	4.9
11	14318524	Nie96	29	34	28.5
	67464126	Kap95	15	26	12.6
12	6325088	Mex67	6	18	6.3
	4389267	Kap alpha	5	25	4.4
13	6325088	Mex67	10	19	9.9
14	6320115	Asm4	9	25	10.9
	6325088	Mex67	7	21	8.1
	6324140	Srp1	6	21	7.2
	1945327	Nup57	5	14	5.3
15					
16	6321266	Nup49	8	26	6.4
17	32693297	Tef1p	12	38	18.3
	6324500	Thp1	7	26	7.9
	6321338	Seh1	5	21	4.7
18	19880894	AF458973_3 TOP2	6	6	0.8
19	1633273	Topoisomerase	4	5	0.4
20	6323237	Sec13	9	31	7.9
21	6320589	Yra1	6	23	9.7
22	2131277	Hfm1	6	13	2.7
23	6320979	Pmd1	8	8	4
24	2447041	Ppf3	5	3	1.4
25	6322974	Yll054cp	2	3	0.2
26	3720	G3PD	4	24	2.5

**Mlp1p-PrA; Δnup53p**



Supplemental Table 6 - Cleavage fragments identified in gels shown in Figure S1, A and B.

Protein Name	Fragment ID	Protease	Mw of fragment	Cleavage site (by Mw estimation)	BAND INTENSITY	Fragment ID	Protease	Mw of fragment	Cleavage site (by Mw estimation)	BAND INTENSITY
	C-terminal tag					N-terminal tag				
Mlp1p	Mlp1p-FL(GFP)		250			-				
						I	AspN	2	C30	+++
						H		12	D105	+++
						G		22	D189	+++
						F		25	D210	++
						E		28	D233-237	+
						D		41	D342	+
	A	AspN	177	D525	++	C		83	D714	+++
	C		154	D778	+++	B		111	D949	+++
	D		133	D945	++	A		132	D1130	+
	E		124	D1030	+++					
	F		112	D1131	+					
	G		102	D1208	++					
	H		88	D1348	+					
	I		66	D1471	++					
	M		50	D1645	+++					
	N		42	D1741	+++					
						(CFP)Mlp1p-FL		250		
Mlp2p	Mlp2-FL(PrA)		221			U	Trypsin/AspN	6	D48	+
						T	Trypsin/AspN	8	D66	+
						S	AspN	12	D98-D116	+
	A'''	AspN	204	D140	+	Q	ApsN	17	D139	+++
						Q'	AspN	20	D175	+
	A''	all three	188	D281	+	P	Trypsin/AspN	30	D259	+++
						M	AspN	37	D307	+++
	A'	all three	167	D460	+	I	AspN	42	D366	+
	A	all three	155	D564	+	G	Trypsin/AspN	59	D504	++
	B''	Trypsin/AspN	139	D678-D740	+	F	all	68	D593	+++
	B'	AspN	130	D768	+	D	all	101	D870	++
	B	AspN	123	D821-D851	+	C	AspN	111	D940	+
	C	all three	109	D940-C996	+++	B	all	124	D1086	+++
	D	Trypsin/AspN	95	D1086	++					
	E	Trypsin/AspN	83	D1165_D1203	+++					
	F	Trypsin/AspN	73	D1267	+++					
	G	AspN	68	D1319	+					
	H	AspN	62	D1356	++					
	I	all three	52	D1442	++					
	L'	Trypsin/AspN	46	D1497	+					
	L	all three	42	D1545	+++					
	M	all three	31	D1632	+					

Supplemental Table 7 – List of *S. cerevisiae* strains used in this study

Strain Name	Descriptive Name	Relevant Genotype	Derivation
W303	wild type	<i>Mata/alpha, leu2-3,112/leu2-3,112, his3-11,15/his3-11,15, trp1-1/trp1-1, can1-100/can1-100, ade2-1/ade2-1, ura3-1/ura3-1</i>	(Thomas and Rothstein, 1989)
BY4741	wild type	<i>MATa, his3Δ1, leu2Δ0, met15Δ0, ura3Δ0</i>	(Brachmann et al., 1998)
yCS135	Δmlp1, Δmlp2	<i>W303 Matalpha, mlp1::URA3, mlp2::HIS3</i>	(Strambio-de-Castillia et al., 1999)
yCS137	wild type	<i>W303 Mata</i>	(Strambio-de-Castillia et al., 1999)
yCS138	Δmlp1, Δmlp2, 2n	<i>W303 Mata/Matalpha, mlp1::URA3/mlp1::URA3, mlp2::HIS3/mlp2::HIS3</i>	(Strambio-de-Castillia et al., 1999)
yCS108	Mlp1p-PrA	<i>W303, Mata, MLP1-PrA(HIS2, URA3)</i>	(Strambio-de-Castillia et al., 1999)
yMN135	PrA-Mlp1p	<i>W303, Mata, PrA-MLP1</i>	Genomic tagging
yCS115	Mlp2p-PrA	<i>W303, Mata, MLP2-PrA(HIS2, URA3)</i>	(Strambio-de-Castillia et al., 1999)
yMN137	PrA-Mlp2p	<i>W303, Mata, PrA-MLP1</i>	Genomic tagging
yMN784	Mlp1p-PrA, Δnup1	<i>W303xBY4741, Mata, MLP1-PrA(HIS2, URA3), nup1::kanMX</i>	Segregant of mating yCS108 with Δnup1 (Giaever et al., 2002)
yMN785	Mlp1p-PrA, Δnup60	<i>W303xBY4741, Matalpha, MLP1-PrA(HIS2, URA3), nup60::kanMX</i>	Segregant of mating yCS108 with Δnup60 (Giaever et al., 2002)
yMN786	Mlp1p-PrA, Δnup84	<i>W303xBY4741, Matalpha, MLP1-PrA(HIS2, URA3), nup84::kanMX</i>	Segregant of mating yCS108 with Δnup84 (Giaever et al., 2002)
yMN787	Mlp1p-PrA, Δnup53	<i>W303xBY4741, Mata, MLP1-PrA(HIS2, URA3), nup53::kanMX</i>	Segregant of mating yCS108 with Δnup53 (Giaever et al., 2002)
yMN788	Mlp1p-PrA, Δpom152	<i>W303xBY4741, Matalpha, MLP1-PrA(HIS2, URA3), pom152::kanMX</i>	Segregant of mating yCS108 with Δpom152 (Giaever et al., 2002)
yMN789	Mlp1p-PrA, Δnup188	<i>W303xBY4741, Matalpha, MLP1-PrA(HIS2, URA3), nup188::kanMX</i>	Segregant of mating yCS108 with Δnup188 (Giaever et al., 2002)

yMN790	Mlp2p-PrA, $\Delta$ nup1	<i>W303xBY4741, Matalpha, MLP2-PrA(HIS2, URA3), nup1::kanMX</i>	Segregant of mating yCS115 with $\Delta$ nup1 (Giaever et al., 2002)
yMN791	Mlp2p-PrA, $\Delta$ nup60	<i>W303xBY4741, Matalpha, MLP2-PrA(HIS2, URA3), nup60::kanMX</i>	Segregant of mating yCS115 with $\Delta$ nup60 (Giaever et al., 2002)
yMN792	Mlp2p-PrA, $\Delta$ nup84	<i>W303xBY4741, Matalpha, MLP1-PrA(HIS2, URA3), nup84::kanMX</i>	Segregant of mating yCS115 with $\Delta$ nup84 (Giaever et al., 2002)
yMN640	Esc1p-PrA	<i>W303, Mata, Esc1-PrA(HIS2)</i>	Genomic tagging
yCS348	CFP-Mlp1p	<i>W303, Mata, ECFP-MLP1</i>	(Niepel et al., 2005)
yMN621	Mlp1p-GFP	<i>BY4741, Mata, Mlp1-GFP(HIS2)</i>	(Huh et al., 2003)
yMN654	Mlp1p-GFP, Mlp2p-GFP	<i>BY4741, Mata, Mlp1-GFP(HIS2), Mlp2-GFP(His2)</i>	Segregant of mating yMN621 with Mlp2p-GFP (Huh et al., 2003)
yCS141	$\Delta$ mlp1, $\Delta$ mlp2	<i>W303, Matalpha, mlp1::ura3::LEU2, mlp2::HIS2</i>	this study
yCS374	Nup49p-GFP	<i>W303, Matalpha, nup49-1::URA3, nup49-GLFG-GFP-S65T(TRP1)</i>	Segregant of mating SWY734 (Bucci and Wentz, 1997) with yCS141
yCS377	Nup49p-GFP, $\Delta$ mlp1, $\Delta$ mlp2	<i>W303, Mata, mlp1::ura3::LEU2, mlp2::HIS2, nup49-1::URA3, nup49-GLFG-GFP-S65T(TRP1)</i>	Segregant of mating SWY734 (Bucci and Wentz, 1997) with yCS141
yCS211	$\Delta$ mlp1, $\Delta$ mlp2	<i>W303, mat a, mlp1::URA3, mlp2::his2::LEU2</i>	this study
yMN173	Mlp1p-MYC	<i>W303, Matalpha, MLP1-MYC(TRP1)</i>	(Niepel et al., 2005)
yMN179	Mlp2p-MYC	<i>W303, Matalpha, MLP2-MYC(TRP1)</i>	(Niepel et al., 2005)
yMN300	Mlp1p-PrA, Mlp2p-MYC	<i>W303, Mata, MLP1-PrA(HIS2, URA3), MLP2-MYC(TRP1)</i>	Segregant of mating yCS108 with yMN179
yMN302	Mlp2p-PrA, Mlp1p-MYC	<i>W303, Mata, MLP2-PrA(HIS2, URA3), MLP1-MYC(TRP1)</i>	Segregant of mating yCS115 with yMN173
yMN755	Nup60-GFP	<i>BY4741, Mata, Nup60-GFP(HIS2)</i>	(Huh et al., 2003)
yMN756	Esc1-GFP	<i>BY4741, Mata, Esc1-GFP(HIS2)</i>	(Huh et al., 2003)

yMN459	$\Delta$ mlp1, $\Delta$ mlp2	<i>W303, Matalpha, mlp1::URA3, mlp2::LEU2</i>	this study
yMN806	Esc1-GFP	BY4741xW303, Mata, Esc1-GFP(HIS2)	spore 2a of mating yMN459 x yMN756
yMN807	Esc1-GFP, $\Delta$ mlp1, $\Delta$ mlp2	BY4741xW303, Mata, Esc1-GFP(HIS2), mlp1::URA3, mlp2::LEU2	spore 2c of mating yMN459 x yMN756
yMN808	Esc1-GFP	BY4741xW303, Mata, Esc1-GFP(HIS2)	spore 5b of mating yMN459 x yMN756
yMN809	Esc1-GFP, $\Delta$ mlp1, $\Delta$ mlp2	BY4741xW303, Matalpha, Esc1-GFP(HIS2), mlp1::URA3, mlp2::LEU2	spore 5c of mating yMN459 x yMN756
yMN810	Esc1-GFP	BY4741xW303, Mata, Esc1-GFP(HIS2)	spore 6a of mating yMN459 x yMN756
yMN811	Esc1-GFP, $\Delta$ mlp1, $\Delta$ mlp2	BY4741xW303, Matalpha, Esc1-GFP(HIS2), mlp1::URA3, mlp2::LEU2	spore 6b of mating yMN459 x yMN756
yCS258	$\Delta$ nup133	<i>W303, Mata, nup133::HIS3</i>	(Doye et al., 1994)