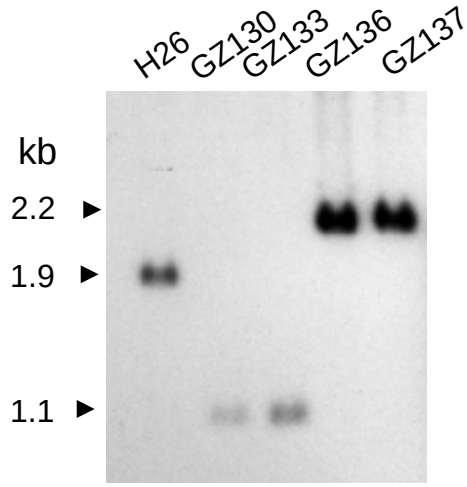
Supplemental Figure Legends

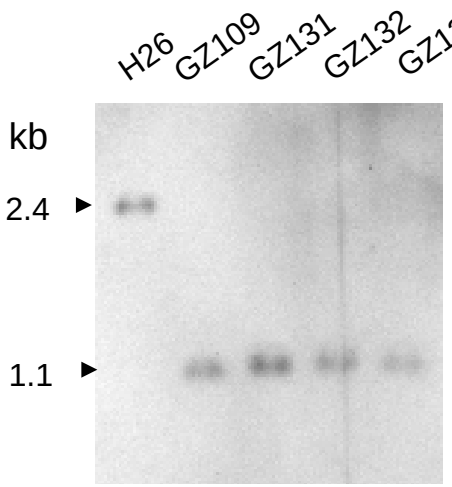
Suppl. Fig. 1. Deletion and P_{tnaA} promoter fusions of 20S proteasome and proteasome-activating nucleotidase genes of the *Hfx. volcanii* chromosome confirmed by Southern blot. Genomic DNA isolated from *Hfx. volcanii* parent and mutant strains (indicated by number on the top of each gel) was digested with restriction enzymes (indicated on bottom of each gel), separated by DNA electrophoresis, transferred by capillary blot to nylon membranes, UV-cross linked and hybridized to a DIG-labelled probe specific for the region immediately 5' or 3' of the gene targeted for deletion (indicated on bottom of each gel). Details on Southern blot and the construction of each probe are detailed in the method section as well as Suppl. Tables 1 and 2. Molecular masses (kb) of DNA fragments hybridizing to the probes, as estimated by comparison to Hi-Lo DNA standards, are indicated on the left.

Suppl. Fig. 2. Deletion and P_{tnaA} promoter fusions of 20S proteasome and proteasome-activating nucleotidase genes of the *Hfx. volcanii* chromosome confirmed by PCR. Genomic DNA isolated from *Hfx. volcanii* parent and mutant strains (indicated on the top of each gel by number) was used as template for PCR with 'Confirm-Forward' and 'Confirm-Reverse' primers, which anneal approximately 200 bp 5' and 3' of the region used to generate the suicide plasmids as detailed in Suppl. Table 1. A summary of the PCR results are detailed in Suppl. Table 2. Molecular masses (kb) of DNA standards and PCR products are indicated on left and right, respectively. All double mutants (GZ120, GZ131, GZ132, GZ133, GZ134) had the same PCR product size as their related single mutants (data not shown). The PCR product of GZ137 was also similar in molecular mass to that of GZ136, data not shown.

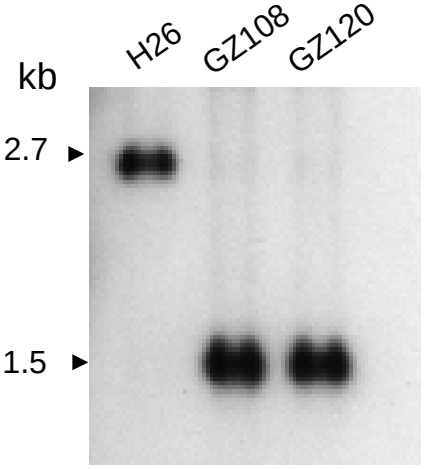
Suppl. Fig. 1



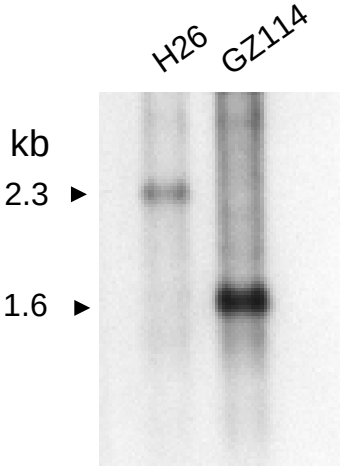
psmA (HVO_1091)
probe 857
EcoRI/EcoRV



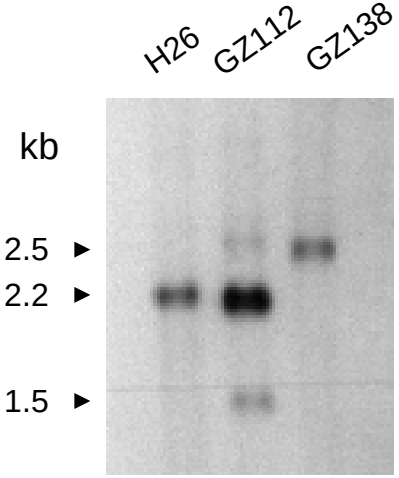
panA (HVO_0850)
probe 1103
SwaI/BpmI



panB (HVO_1957)
probe 3059
NruI

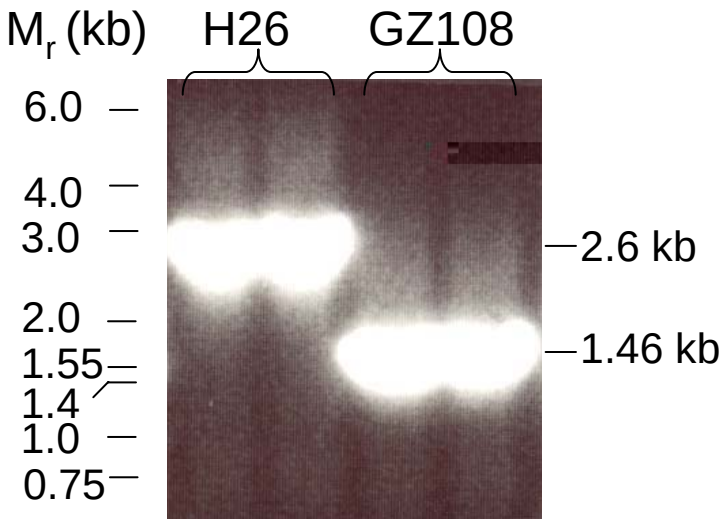


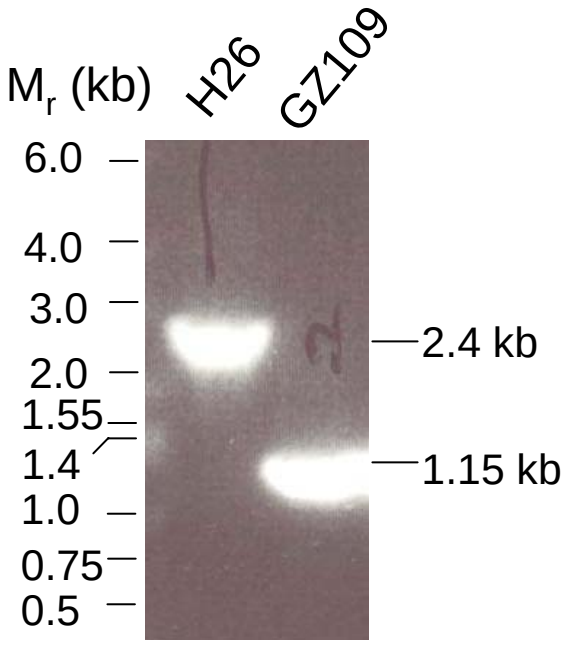
psmC (HVO_2923)
probe 2057
AleI/BpmI

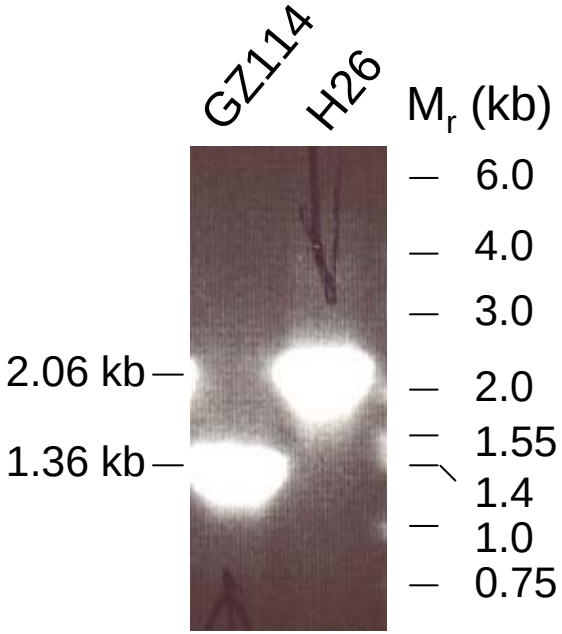


psmB (HVO_1562)
probe 375
EcoRI/BspMI

Suppl. Fig. 2


M$_r$ (kb)
H26
GZ108
6.0
4.0
3.0
2.0
1.55
1.4
1.0
0.75
2.6 kb
1.46 kb


M$_r$ (kb)
H26
GZ109
6.0
4.0
3.0
2.0
1.55
1.4
1.0
0.75
0.5
2.4 kb
1.15 kb


GZ114
H26
M$_r$ (kb)
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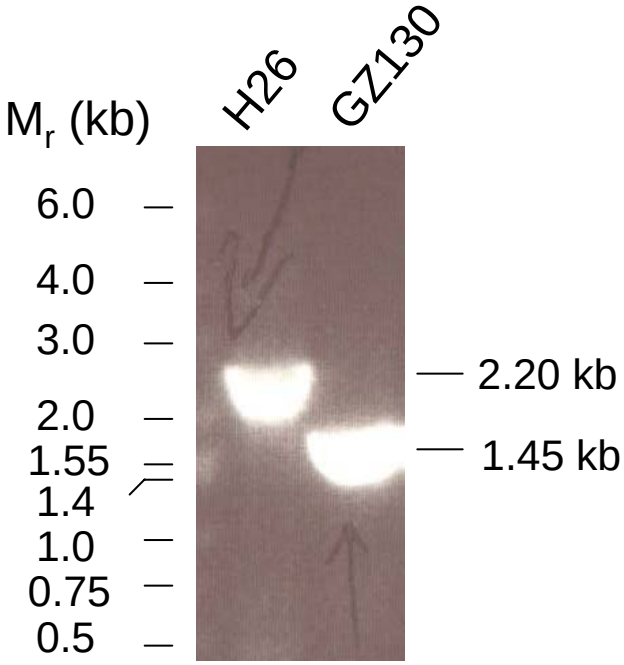
4.0
3.0
2.0
1.55
1.4
1.0
0.75
2.06 kb
1.36 kb


M$_r$ (kb)
H26
GZ130
6.0
4.0
3.0
2.0
1.55
1.4
1.0
0.75
0.5
2.20 kb
1.45 kb

Suppl. Fig. 2 (cont.)