Table 1. Roughness and section analyses, changes in morphology, mean cell volume and bearing volume analyses of the ethanol stressed yeasts

Ethanol stress									
		Saccharomyces cerevisiae (strain NCYC 1681)				*Schizosaccharomyces pombe* (strain DVPB 1354)			
Time (min)	Ethanol concentration (% v/v)	Roughness* (nm)/shape and morphology†	Mean cell volume (μm^3)	Mean bearing volume (μm^3)	Relative change compared to the control‡	Roughness* (nm)/shape and morphology†	Mean cell volume (μm^3)	Mean bearing volume (μm^3)	Relative change compared to the control‡
–	0 (control)	75.4 ± 6.2 /R & N	297.0 ± 5.9	134.3 ± 7.4	–	69.9 ± 5.5/R & N	265.0 ± 5.3	100.4 ± 3.6	–
10		77.7 ± 4.9/R & N	278.0 ± 5.6	121.2 ± 9.9	L	92.0 ± 5.5/R & S	235.0 ± 4.7	87.3 ± 4.0	H
30	10	109.9 ± 5.6/R & N	265.0 ± 5.3	108.0 ± 3.4	L	105.7 ± 2.9/R & S	227.0 ± 4.5	79.3 ± 4.9	H
60		113.6 ± 4.1/I & S	249.0 ± 5.0	99.2 ± 5.0	L	117.9 ± 2.3/R & S	213.0 ± 4.3	73.1 ± 3.4	H
10		106.9 ± 6.7/R & N	255.0 ± 5.1	97.9 ± 4.7	L	103.2 ± 8.3/I & S	188.0 ± 3.8	59.2 ± 3.3	H
30	20	116.8 ± 13.3/R & N	234.0 ± 4.7	84.0 ± 5.2	L	113.7 ± 24.6/I & S	191.0 ± 3.8	54.1 ± 2.5	H
60		131.4 ± 6.9/I & S	228.0 ± 4.6	79.3 ± 4.4	L	132.5 ± 24.3/I & S	187.0 ± 3.7	50.0 ± 2.8	H
10		119.0 ± 4.5/I & S	224.0 ± 4.5	86.7 ± 5.1	L	126.1 ± 4.8/I & S	153.0 ± 3.1	44.1 ± 1.8	H
30	30	141.9 ± 6.7/I & S	214.0 ± 4.3	64.3 ± 4.0	L	141.3 ± 4.7/I & S	121.0 ± 2.4	40.7 ± 1.4	H
60		154.3 ± 18.4/I & S	206.0 ± 4.1	62.4 ± 3.6	L	154.6 ± 6.8/I & S	116.0 ± 2.3	37.7 ± 1.1	H

*For each ethanol concentration and exposure times indicated, the surface roughness of 20 yeast cells chosen randomly was measured at four different zones of the cell surface. The zones chosen for *Saccharomyces cerevisiae* and *Schizosaccharomyces pombe* were 7 and 5 μm^2, respectively. The values for the surface roughness are given as weighted mean ± standard deviation. †The shapes of the stressed yeasts are defined (see section on Roughness, section, and bearing volume analyses) as R (regular) or I (irregular) in comparison with the shapes of the unstressed (0% ethanol) cells. The morphology of the stressed yeasts (see section on AFM) is defined as N (normal) or S (shrunk) when compared to that of the control (0% ethanol) cells. ‡Relative changes (L: low or H: high) of the ethanol stress on the morphology (roughness and bearing volume analyses) and physiology (mean cell volume measurements) of stressed cells compared to those of the unstressed cells (0% ethanol).