Study of the yeast cytosolic Hsp70-system in protein homeostasis and life span regulation - The molecular chaperone GFP-Hsp104 before and after heat stress in a Hsp70-mutant yeast strain with exogenous complementation of wildtype and chimaeric mutant alleles of yeast Hsp70-alleles

SND-ID: 2020-36-6. **Version**: 1. **DOI**: https://doi.org/10.5878/mez1-3z30

Download data

GFP-HSP104 in WT and ssa12DD with SSA1-4 chimaeras/180615 WT and ssa1-2DD GFP-HSP104 w. SSA4-SSA1 constructs.zip *(11.7 GB)*

GFP-HSP104 in WT and ssa12DD with SSA1-4 chimaeras/180618 ssa1-2DD GFP-HSP104 w SSA1-SSA4 constructs.zip *(12.41 GB)*

GFP-HSP104 in WT and ssa12DD with SSA1-4 chimaeras/180621 ssa1-2DD GFP-HSP104 w SSA1-SSA4 constructs.zip *(12.05 GB)*

GFP-HSP104 in WT and ssa12DD with SSA1-4 chimaeras/180627 ssa1-2DD GFP-HSP104 w SSA1-SSA4 constructs.zip *(11.12 GB)*

GFP-HSP104 in WT and ssa12DD with SSA1-4 chimaeras/180628 WT and ssa1-2DD GFP-HSP104 w SSA1-SSA4 constructs.zip *(10.85 GB)*

GFP-HSP104 in WT and ssa12DD with SSA1-4 chimaeras/180703 WT and ssa1-2DD GFP-HSP104 w SSA1-SSA4 constructs.zip *(19.85 GB)*

GFP-HSP104 in WT and ssa12DD with SSA1-4 chimaeras/180705 WT and ssa1-2DD GFP-HSP104 w SSA1-SSA4 constructs.zip *(17.95 GB)*

Associated documentation

2D gel electrophoresis.pdf *(330.81 KB)*

Data set file index.xlsx *(42.92 KB)*

GFP-HSP104 in WT and HSP70 mutants.pdf *(338.1 KB)*

GFP-HSP104 in WT and ssa12DD with SSA1-4 chimaeras.pdf *(342.27 KB)*

guk1-7-GFP microscopy.pdf *(338.56 KB)*

guk1-7-GFP w Sik1-RFP and DAPI.pdf *(339.77 KB)*

guk1-7-GFP w-wo HSP104 microscopy.pdf *(341.27 KB)*

gus1-3-GFP microscopy.pdf *(335.64 KB)*

Hsp42 IF microscopy.pdf *(536.47 KB)*

Mca1-GFP microscopy.pdf *(335.98 KB)*

ReadMe Access to microscopy files.pdf *(225.14 KB)*

Ssa4-GFP Mca1-RFP microscopy.pdf *(510.88 KB)*

Timelapse microscopy.pdf *(343.15 KB)*

Total Hsp70 western blots.pdf *(587.73 KB)*

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2020-36-6-1.zip *(~95.93 GB)*

Citation

Andersson, R., Hanzén, S., Vielfort, K., & Nyström, T. (2020) Study of the yeast cytosolic Hsp70-system in protein homeostasis and life span regulation - The molecular chaperone GFP-Hsp104 before and after heat stress in a Hsp70-mutant yeast strain with exogenous complementation of wildtype and chimaeric mutant alleles of yeast Hsp70-alleles (Version 1) [Data set]. University of Gothenburg. Available at: https://doi.org/10.5878/mez1-3z30

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Description

Our study aims to answer the question "Which functions of the Hsp70 class of molecular chaperones are essential for yeast to maintain a standard replicative life span?". To answer this question, we utilised the disparate functions of the Hsp70's Ssa1 and 2 and their paralog Ssa4 in a yeast strain that lacks Ssa1/2 but has an ectopically increased production of Ssa4. We have gathered data on the behaviour of several different markers for protein aggregation under different circumstances, as well as data on proteins from other classes of molecular chaperones. The bulk of the data is in the form of multichannel microscopy images from widefield microscopy, with a few sets of western blots of protein extracts.

Fluorescence microscopy of live yeast cells at mid-exponential growth and after 30 minutes of heat shock. The cells were grown in complete synthetic media lacking histidine and leucine with 2 % galactose as carbon source. All strains carry two plasmids; one expressing GFP-HSP104 under the control of the GAL-promoter and one expressing SSA1, SSA4 or SSA1/SSA4 chimaeras (alternatively an empty plasmid) under the control of the GPD-promoter.
The dataset was collected through fluorescence microscopy.
The image files are provided in Carl Zeiss Image format (.czi).

Data contains personal data

No

Language

English

Unit of analysis

Cells

Population

Saccharomyces cerevisiae (Baker's yeast)

Study design

Experimental study

Preclinical study

Sampling procedure

Total universe/Complete enumeration

Time period(s) investigated

2012 – 2020

Data format / data structure

Still image

Data collection 1

- Mode of collection: Biological tests
- Time period(s) for data collection: 2018-06-15 – 2018-07-05
- Data collector: University of Gothenburg
- Source of the data: Research data: Unpublished, Biological samples, Research data

Responsible department/unit

Institute of Biomedicine, Department of Microbiology and Immunology

Funding

- Funding agency: Knut and Alice Wallenberg Foundation

Research area

Biochemistry and molecular biology (Standard för svensk indelning av forskningsämnen 2011)

Cell biology (Standard för svensk indelning av forskningsämnen 2011)

Microbiology (Standard för svensk indelning av forskningsämnen 2011)

Cell and molecular biology (Standard för svensk indelning av forskningsämnen 2011)

Keywords

Cellular senescence, Molecular chaperones, Hsp70 heat-shock proteins, Proteostasis deficiencies

Publications

Andersson R, Eisele-Bürger AM, Hanzén S, Vielfort K, Öling D, Eisele F, Johansson G, Gustafsson T, Kvint K, Nyström T. Differential role of cytosolic Hsp70s in longevity assurance and protein quality control. bioRxiv. 2020 Jun 29. Available from: https://www.biorxiv.org/content/10.1101/2020.06.25.170670v2.full
DOI: https://doi.org/10.1101/2020.06.25.170670

Andersson R, Eisele-Bürger AM, Hanzén S, Vielfort K, Öling D, Eisele F, et al. (2021) Differential role of cytosolic Hsp70s in longevity assurance and protein quality control. PLoS Genet 17(1): e1008951.

DOI: https://doi.org/10.1371/journal.pgen.1008951

If you have published anything based on these data, please notify us with a reference to your publication(s). If you are responsible for the catalogue entry, you can update the metadata/data description in DORIS.

Accessibility level

Access to data through SND
Data are freely accessible

Use of data

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License

Versions

Version 1. 2020-12-16

Contact for questions about the data

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Related research data in SND's catalogue

Study of the yeast cytosolic Hsp70-system in protein homeostasis and life span regulation - The misfolding protein marker gus1-3-GFP and the metacaspase Mca1-GFP during mid-exponential growth in yeast Hsp70-mutant yeast strains

Study of the yeast cytosolic Hsp70-system in protein homeostasis and life span regulation - The misfolding protein marker guk1-7-GFP before, during and after in recovery from heat shock stress in Hsp70-mutant yeast strains

Study of the yeast cytosolic Hsp70-system in protein homeostasis and life span regulation - Intracellular colocalisation of the chaperone Ssa4-GFP and the metacaspase Mca1-RFP before and after heat stress in a Hsp70-mutant yeast cell strain

Study of the yeast cytosolic Hsp70-system in protein homeostasis and life span regulation - The molecular chaperone GFP-Hsp104 before and after heat stress in Hsp70-mutant yeast strains

Study of the yeast cytosolic Hsp70-system in protein homeostasis and life span regulation - Timelapse microscopy of the misfolding protein guk1-7-GFP in recovery after heat stress in Hsp70- and Hsp104-mutant yeast strains

Study of the yeast cytosolic Hsp70-system in protein homeostasis and life span regulation - Hsp70-mutant yeast cells with the misfolding marker protein guk1-7-GFP, the nucleolar marker Sik1-RFP and nuclear staining with DAPI imaged before, directly after, and during recovery from heat stress

Study of the yeast cytosolic Hsp70-system in protein homeostasis and life span regulation - Hsp70-mutant yeast strains with the misfolding marker protein guk1-7-GFP and with or without an intact HSP104-allele, imaged during mid-exponential growth

Study of the yeast cytosolic Hsp70-system in protein homeostasis and life span regulation - Western blots of SDS-PAGE gels with primary antibodies against Hsp70p and Pgk1p

Study of the yeast cytosolic Hsp70-system in protein homeostasis and life span regulation - Immunocytofluoroscense of Hsp70-mutant yeast strains with primary antibodies against Hsp42p

Study of the yeast cytosolic Hsp70-system in protein homeostasis and life span regulation - Silver stained 2D-gels of protein extracts from wild type and Hsp70-mutant yeast strains

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DCAT-AP-SE 2.0

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File overview (CSV)

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