

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

SND-ID: 2020-36-5. **Version:** 1. **DOI:** <https://doi.org/10.5878/wj4m-y925>

Download data

Timelapse microscopy/190319 ssa1-2DD pguk1-7-GFP timelapse.zip (3.24 GB)

Timelapse microscopy/190320 WT pguk1-7-GFP timelapse.zip (2.41 GB)

Timelapse microscopy/190321 WT ssa1-2DD SSA4OE pguk1-7GFP timelapse.zip (4.93 GB)

Timelapse microscopy/190322 WT ssa1-2DD SSA4OE pguk1-7GFP timelapse.zip (2.18 GB)

Timelapse microscopy/190326 ssa1-2DD pguk1-7GFP timelapse.zip (1.67 GB)

Timelapse microscopy/190417 wt hsp104D guk1-7-GFP timelapse.zip (4.34 GB)

Timelapse microscopy/190418 WT hsp104D guk1-7-GFP timelapse.zip (3.25 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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2020-36-5-1.zip (~22.02 GB)

Citation

Hanzén, S., Andersson, R., & Nyström, T. (2020) 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 (Version 1) [Data set]. University of Gothenburg. Available at: <https://doi.org/10.5878/wj4m-y925>

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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.

Timelapse microscopy of yeast cells during recovery after 30 minutes of heat shock. The yeast was cultivated in complete synthetic media with 2 % glucose as carbon source. All strains produce the misfolding protein *guk1-7-GFP*.

The dataset was collected through timelapse microscopy of the same yeast cells for 2 hours. 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: 2019-03-19 – 2019-04-18
- 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

[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>

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Accessibility level

Access to data through SND

Data are freely accessible

Use of data

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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 - 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](#)

[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 - Immunocytofluorescence 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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