group and subjected for complete transcriptome analysis. In order to profile the transcriptome changes with the best possible resolution, we utilized the robustness and accuracy of the Next-generation Sequencing (NGS) RNA-seq technology.

To further develop our infection models we established an in vitro system using primary human mononuclear blood cells. Monocyte-derived immature and mature dendritic cells (iDCs, mDCs) as well as macrophages (MΦ) co-cultured with live WT or LIP- *C. parapsilosis* strains were studied to determine the host response. We determined that all cell types efficiently phagocytosed and killed *C. parapsilosis*, furthermore our results show that the phagocytic and fungicidal activities of both iDCs and mDCs are more potent for LIP- compared to WT yeast cells. Notably, MΦ showed eleveted fungal killing activity to LIP- cells but no increased phagocitic capacity was detectable. In addition, the LIP- *C. parapsilosis* cells induce higher gene expression and protein secretion of proinflammatory cytokines and chemokines in all cell types relative to the effect of co-culture with WT yeast cells. Our results show that both DCs and MΦ are activated by exposure to *C. parapsilosis*, as shown by increased phagocytosis, killing and proinflammatory protein secretion. Moreover, these data strongly suggest that *C. parapsilosis* derived lipase has a protective role during yeast:phagocyte interactions, since lipase production in wt yeast cells decreased the phagocytic capacity (in case of DCs) and killing efficiency of host cells and downregulated the expression of host effector molecules.

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The role of guard cell photosynthesis in biotic stress-induced stomatal closure

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Guard cells (GCs) control gas exchange and transpirational water loss of leaves by turgor-driven volume changes. Environmental and hormonal signals regulate opening and closure by activating diverse signalisation networks and membrane transporters. GCs also respond to the presence of microbes following perception of microbe-associated molecular patterns, such as a fungal elicitor chitosan (CHT). It has been shown that CHT inhibits the blue light-induced stomatal opening and can trigger stomatal closure through distinct signaling pathways and transporters. Stomatal opening and closure is related to the H^+-ATPase activity in the GC plasma membrane, as it affects the transport of osmotically active solutes. ATP for proton pumping is partly supplied from photophosphorylation in *Vicia faba* GCs (Mawson 1993). In order to investigate whether CHT affects the photosynthetic ATP production, the light-dependence of the photosynthetic electron transport rate of individual GCs was assayed. We found that when CHT was applied before sunrise, the apparent relative linear electron transport rate (ETR) remained low contrary to control. However, when CHT was sprayed on leaves by day, it only induced slight stomatal closure without a significant change of these photosynthetic parameters. CHT was shown to induce the generation of both reactive oxygen and nitrogen species in pea GCs (Srivastava et al. 2009). Using fluorescent probes we found that one hour of CHT treatment led to a significant increase in both hydrogen peroxide (H_2O_2) and nitric oxide (NO) levels of *Vicia* GC chloroplasts. H_2O_2 accumulated mainly in chloroplast stroma and nucleus, while NO was found in the cytosol and chloroplasts. We also found that the inhibitory effect of CHT on the morning photosynthesis can be mimicked by exogenously applied NO, therefore it can be hypothesized that CHT acts through the NO signaling pathway.

NO triggers the release of Ca^{2+} from intracellular stores in GCs, which leads to stomatal closure. NO may also have an indirect effect through the decrease of intracellular ATP level generated by GC chloroplasts. Earlier we showed that NO slows down electron transfer between Q_A and Q_B, and inhibits charge recombination reactions of Q_A^- with the S_2 state of the water-oxidizing complex in pea leaves (Wodala et al. 2008). The microscopy version of a pulse-amplitude-modulated chlorophyll fluorometer (PAM) combined with a rapid solution exchanger allowed us to monitor the photosynthetic activity of a GC before and after the addition and also rapid removal of NO. The concentration of NO released from GSNO under light was measured in a solution entering the recording chamber using a NO-electrode. We found that NO decreases the electron transport rate resulting in a modest acidification of the thylakoid lumen and conceivably a reduced ATP synthesis. Variable fluorescence yield (Fv) was increased immediately in a biphasic manner after the inflow of the NO-containing solution, in line with the kinetic differences in the changes of photochemical and non-photochemical quenching. The wash-out of NO resulted in a sudden decrease of Fv, which was further accelerated by bicarbonate, a competitor of NO to the binding side of the non-heme iron between Q_A and Q_B.

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