Description of Additional Supplementary Data Files

File name: Supplementary Data S1

Description: Biomass composition

File name: Supplementary Data S2

Description: Details on phenotypic growth assays, gene essentiality data and quantitative predictability

File name: Supplementary Data S3

Description: *A. fumigatus* strain metadata

File name: Supplementary Data S4

Description: Details on experimental data including metabolomics, radial growth and metabolic activity

File name: Supplementary Data S5

Description: Machine learning model using minimal media

File name: Supplementary Data S6

Description: Metagenomics of cystic fibrosis samples

File name: Supplementary Data S7

Description: Metadata of clinical cystic fibrosis samples

File name: Supplementary Data S8

Description: Metabolite analysis using MAMBO

File name: Supplementary Data S9

Description: Detailed GEM information

File name: Supplementary Data S10

Description: Constraint details corresponding to specific *in silico* simulations