

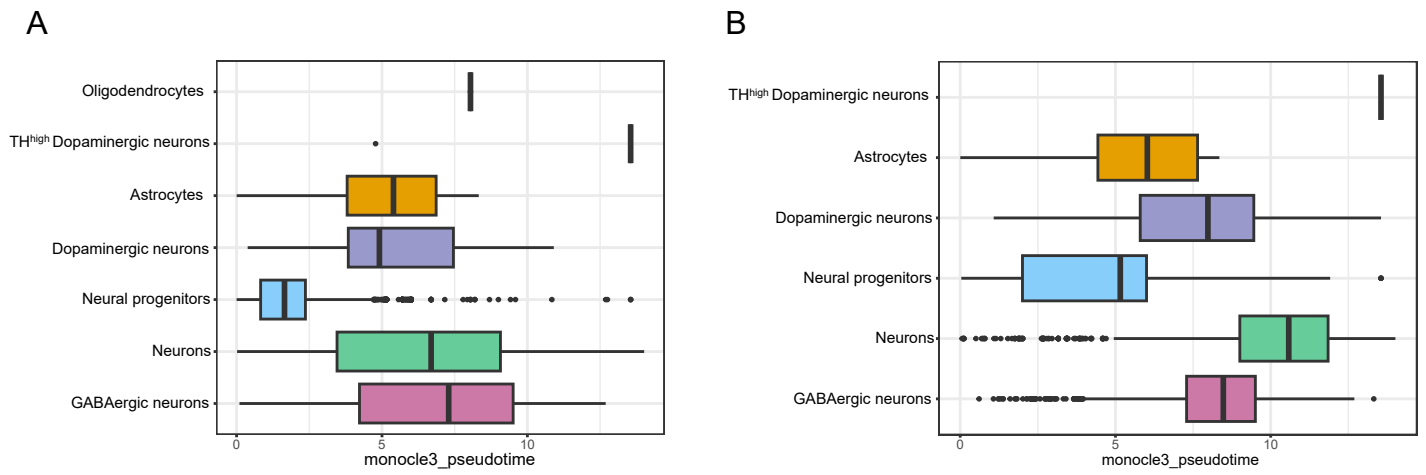
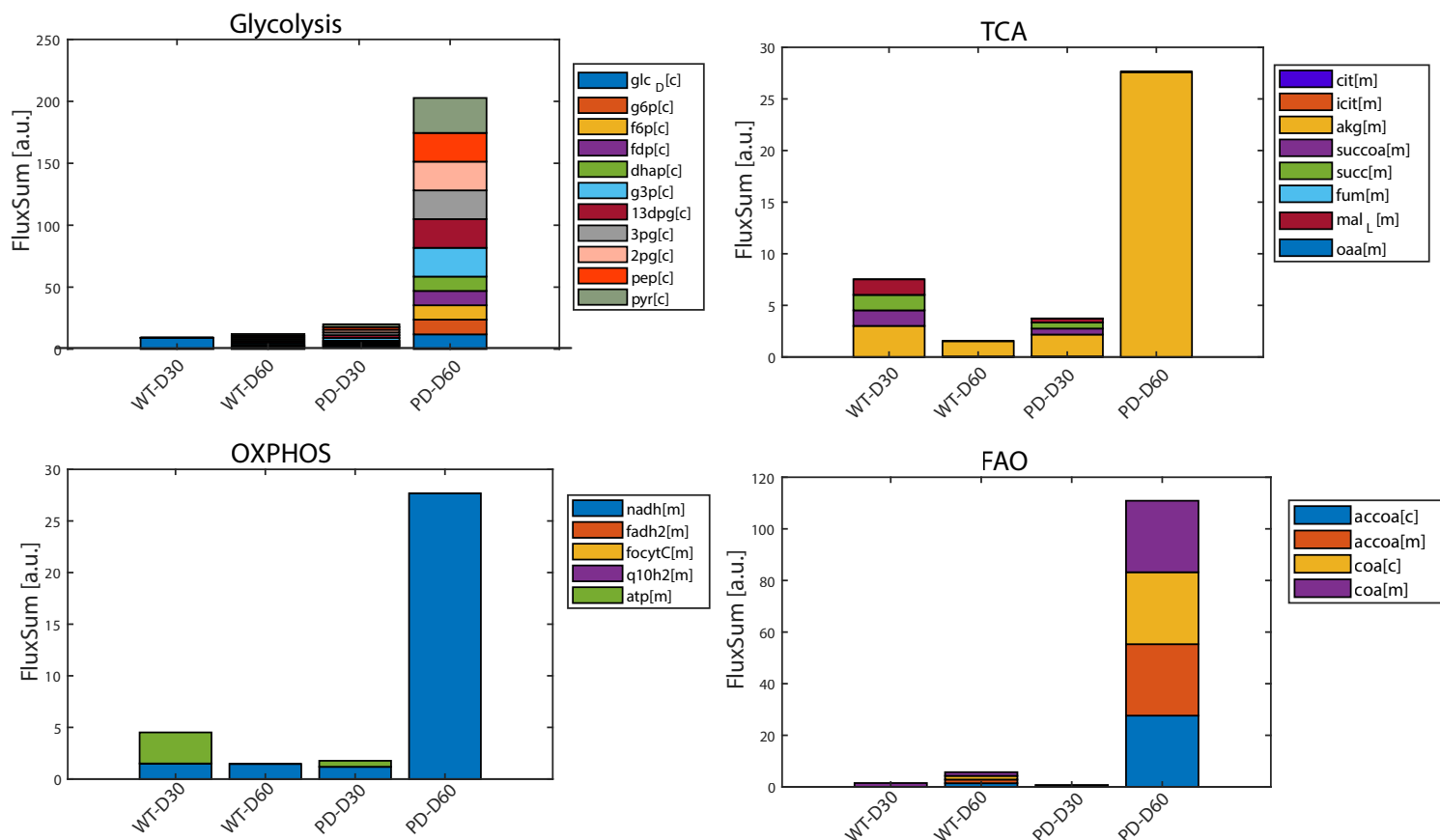


Figure S1. MIRO1 mutant organoids show loss of vulnerable dopaminergic neurons and altered developmental path of cellular populations.

(A) Estimated pseudotime for all cell types in WT midbrain organoids (combined day 30 and day 60). (B) Estimated pseudotime for all cell types in PD midbrain organoids (combined day 30 and day 60).

A Dopaminergic neurons



B Astrocyte-like progenitors

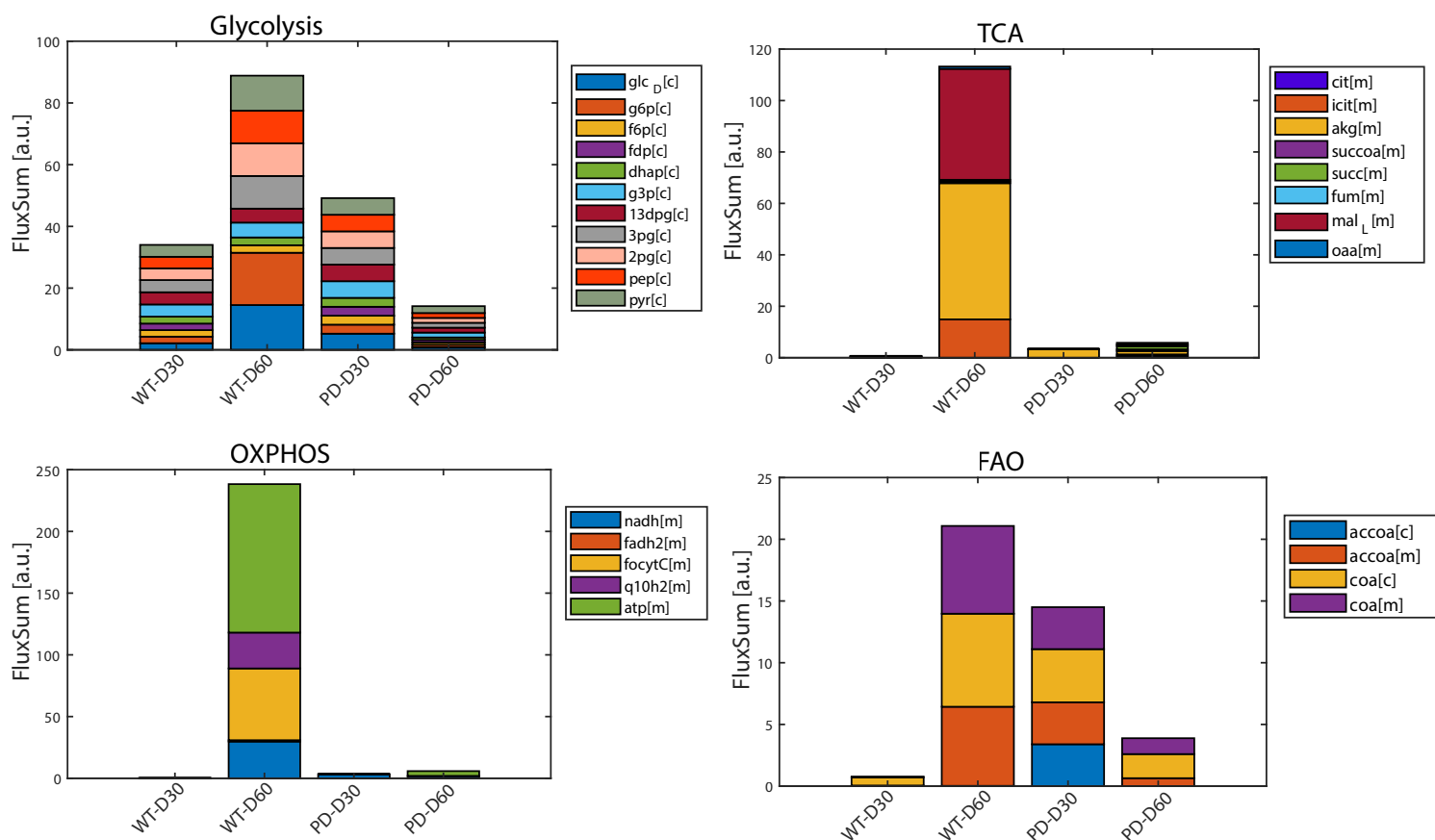
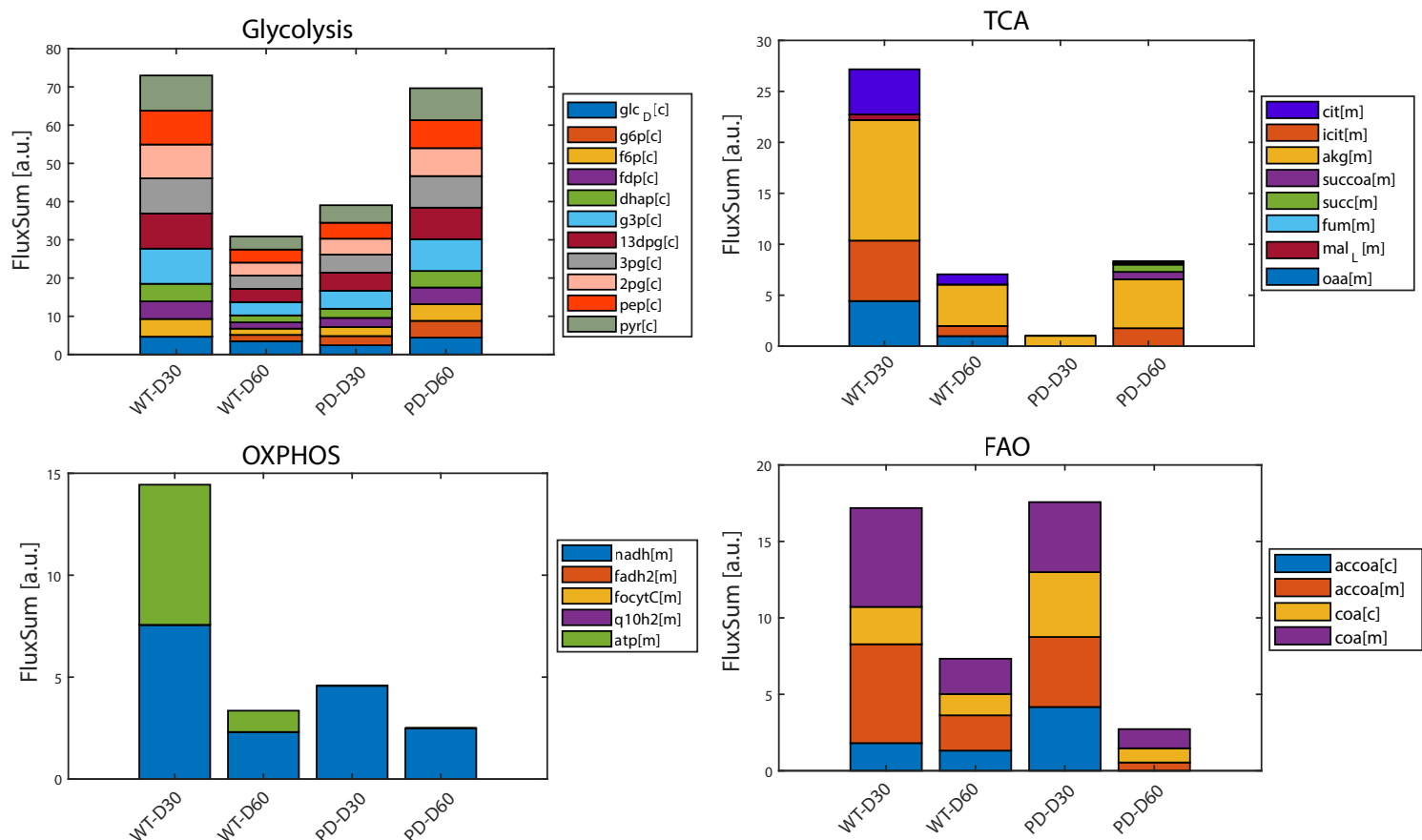


Figure S2. Multi-cell population modelling predicts differential activities of core metabolic pathways in WT vs PD conditions.

Estimated FluxSum (in [a.u.]) per metabolite (sum of incoming metabolic fluxes in FBA solution) in (A) dopaminergic neurons and (B) astrocytes and are shown as bar plots of key metabolites per metabolic pathway.

A Neural progenitors



B Neurons

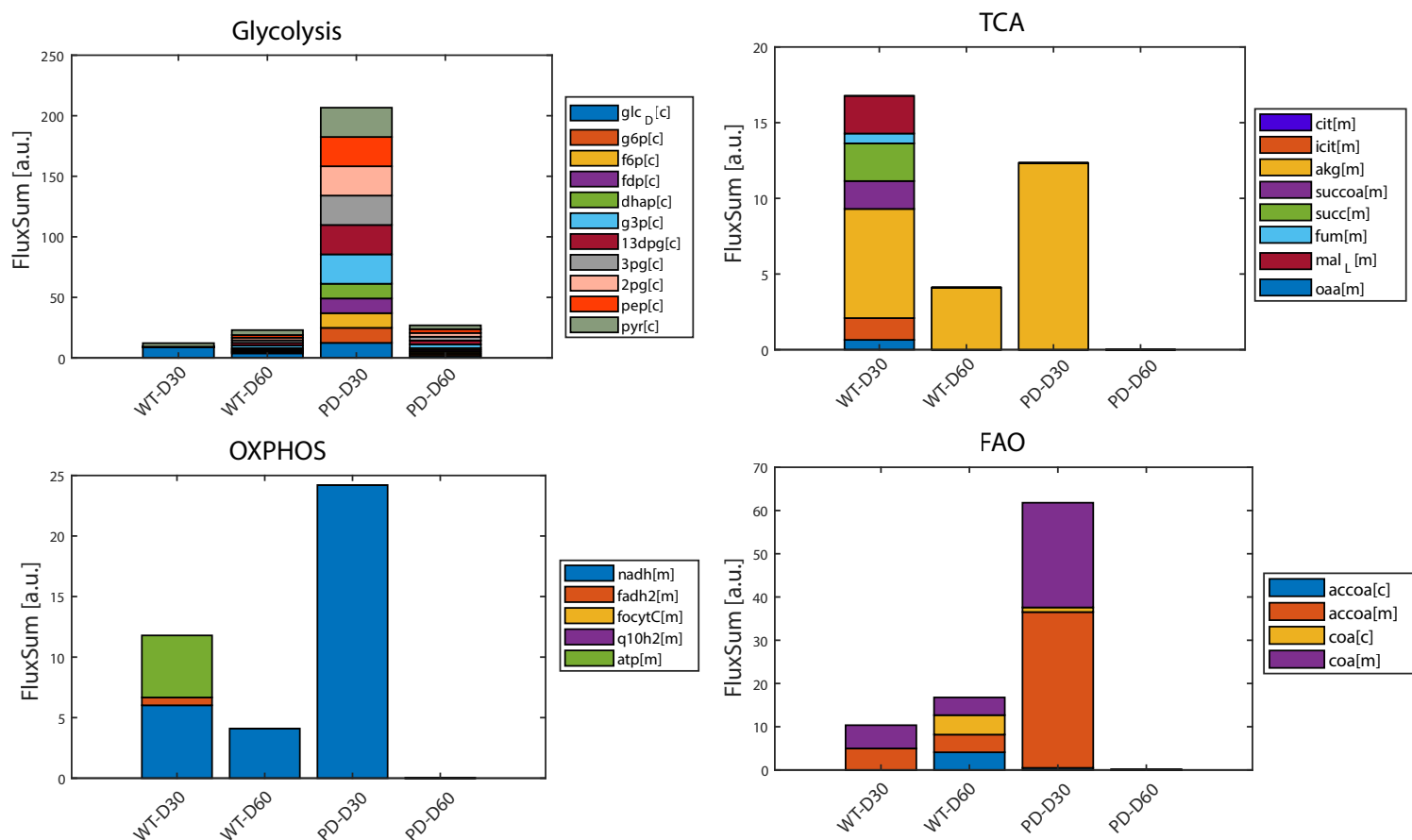
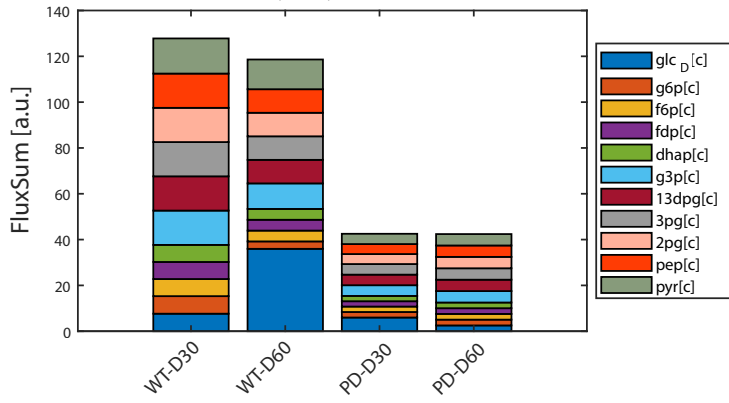


Figure S3. Multi-cell population modelling predicts differential activities of core metabolic pathways in WT vs PD conditions.

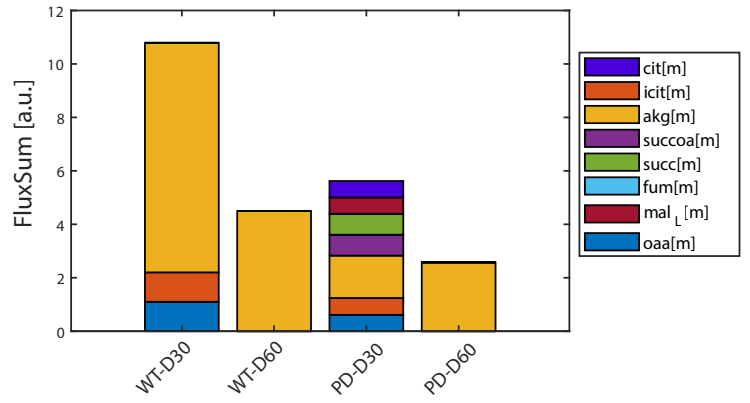
Estimated FluxSum (in [a.u.]) per metabolite (sum of incoming metabolic fluxes in FBA solution) in (A) neurons and (B) neural progenitor cells and are shown as bar plots of key metabolites per metabolic pathway.

GABAergic neurons

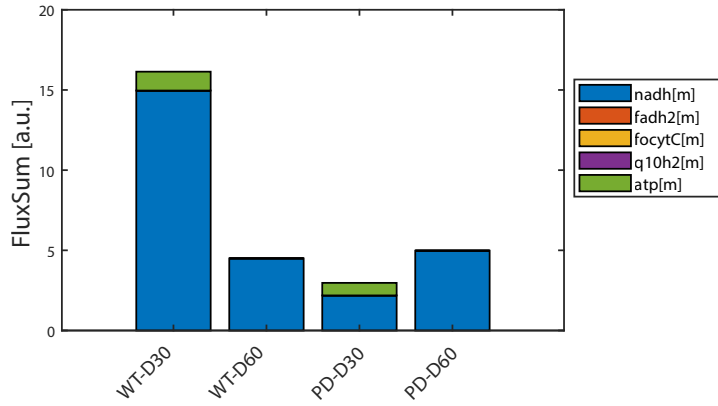
Glycolysis



TCA



OXPHOS



FAO

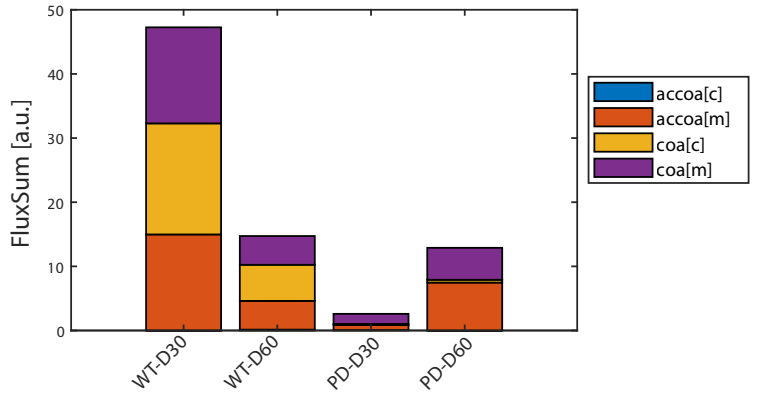


Figure S4. Multi-cell population modelling predicts differential activities of core metabolic pathways in WT vs PD conditions.

Estimated FluxSum (in [a.u.]) per metabolite (sum of incoming metabolic fluxes in FBA solution) in GABAergic neurons and are shown as bar plots of key metabolites per metabolic pathway.