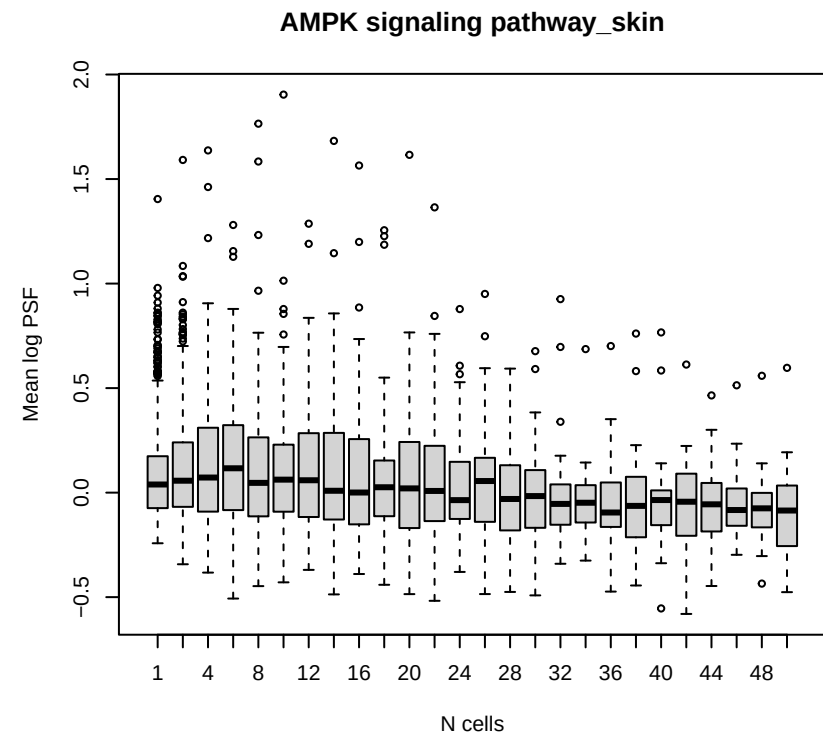
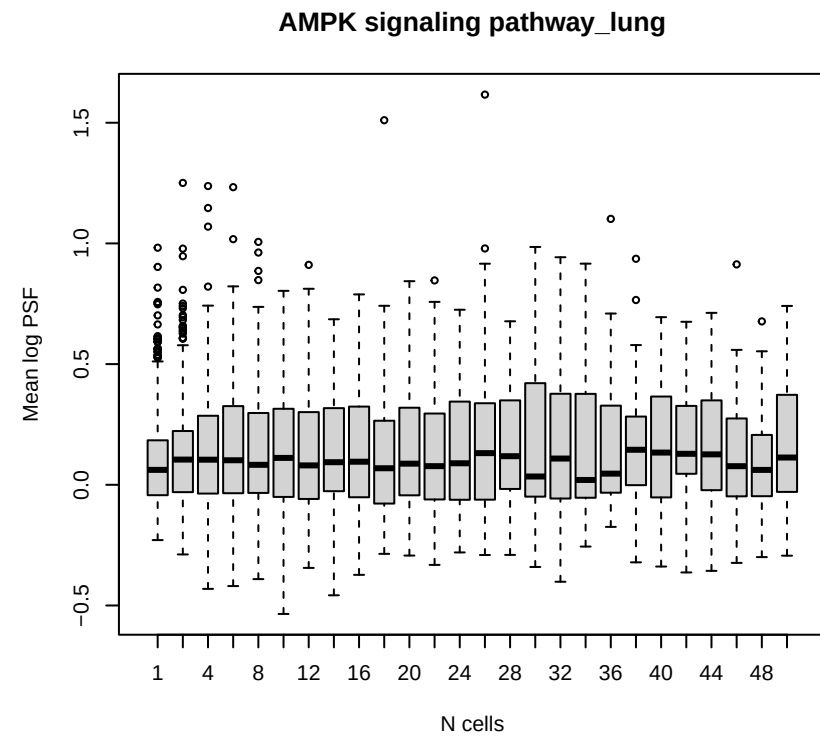
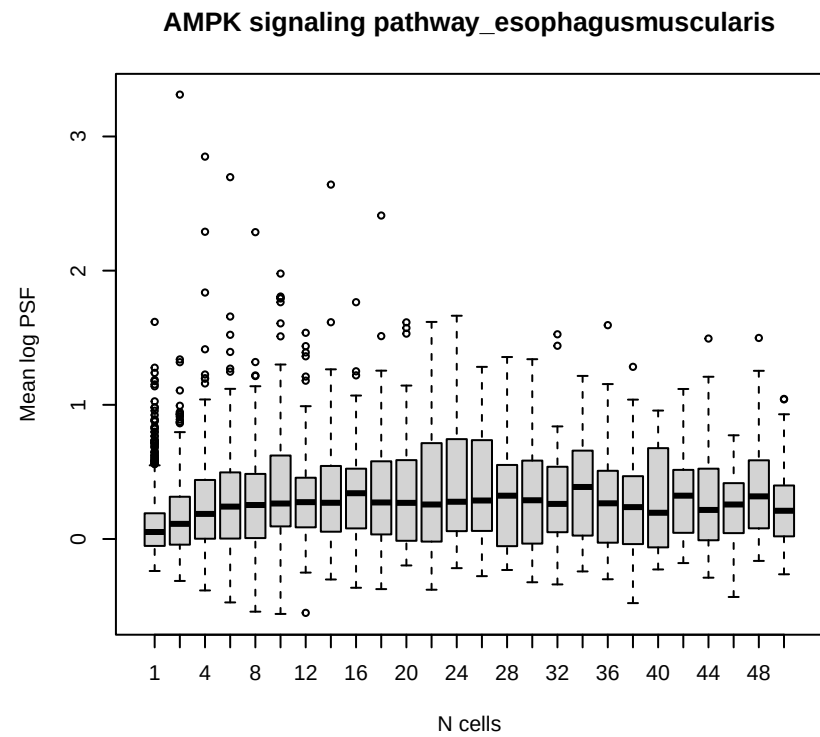
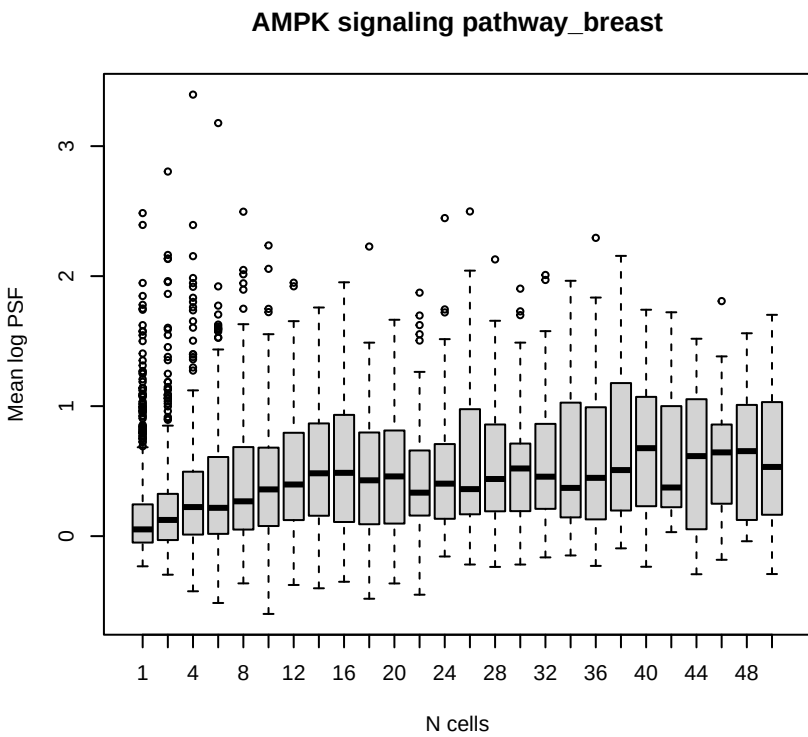
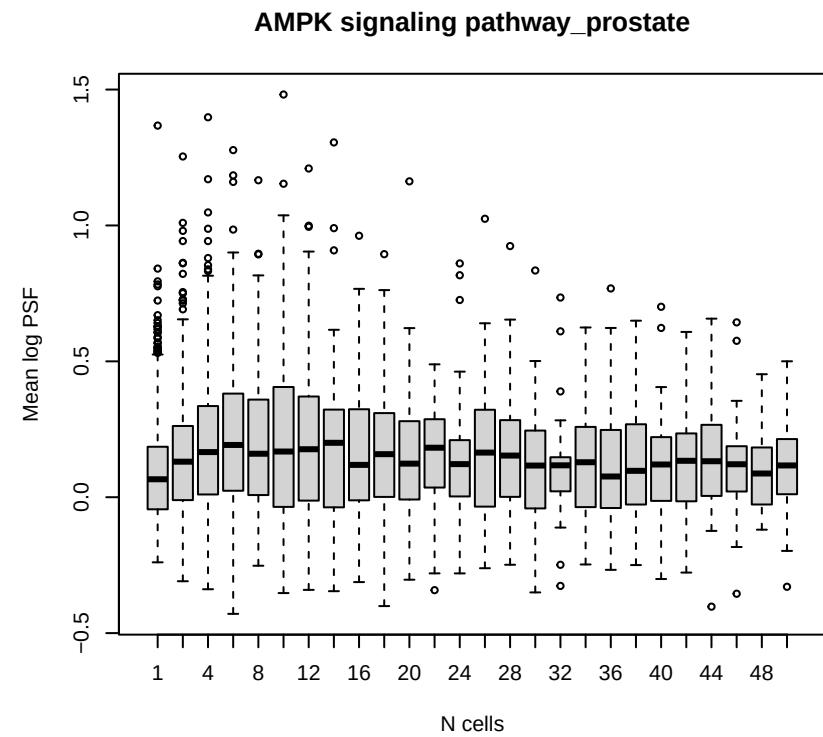
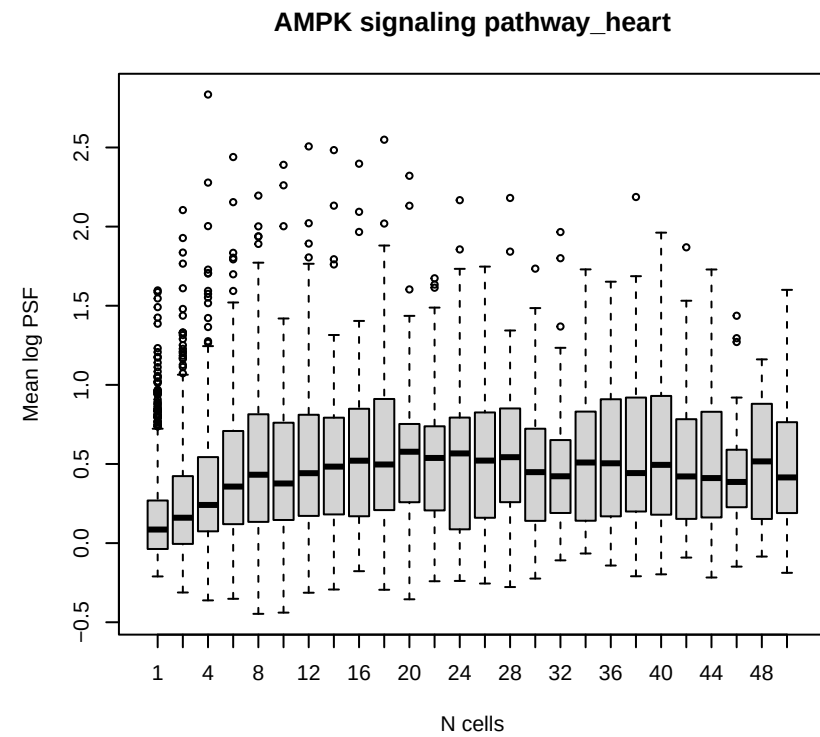
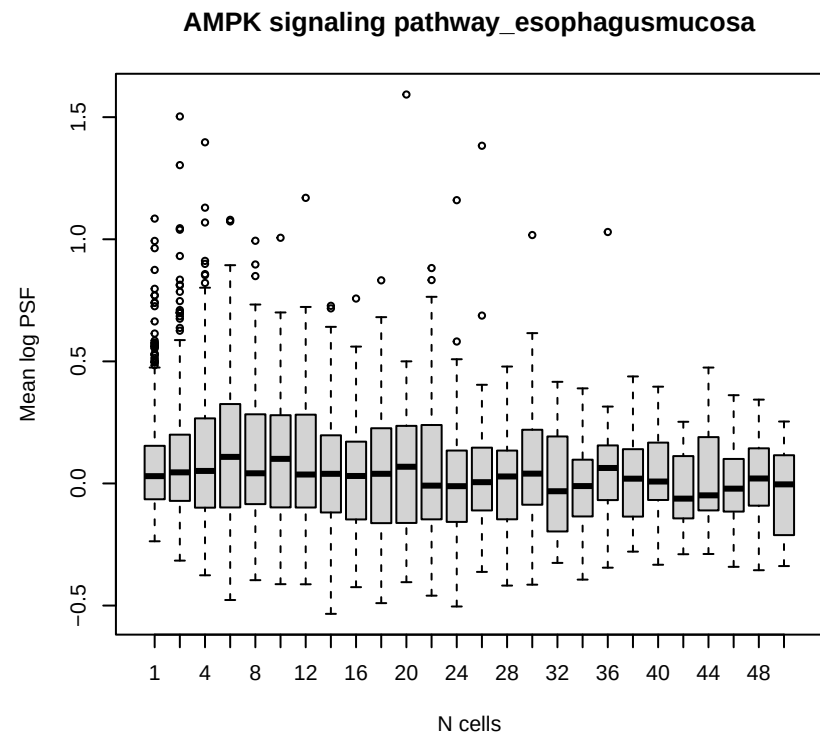
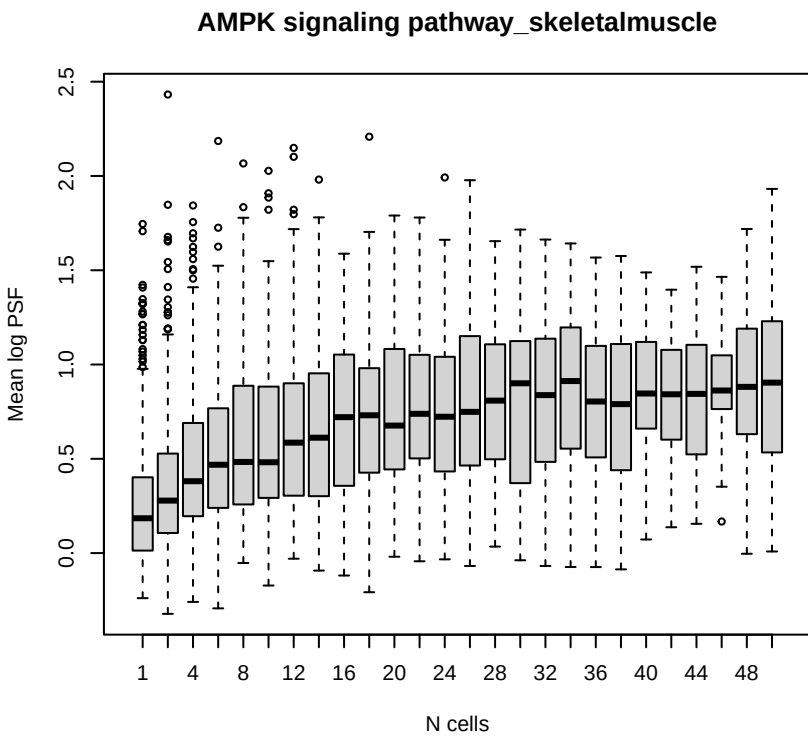
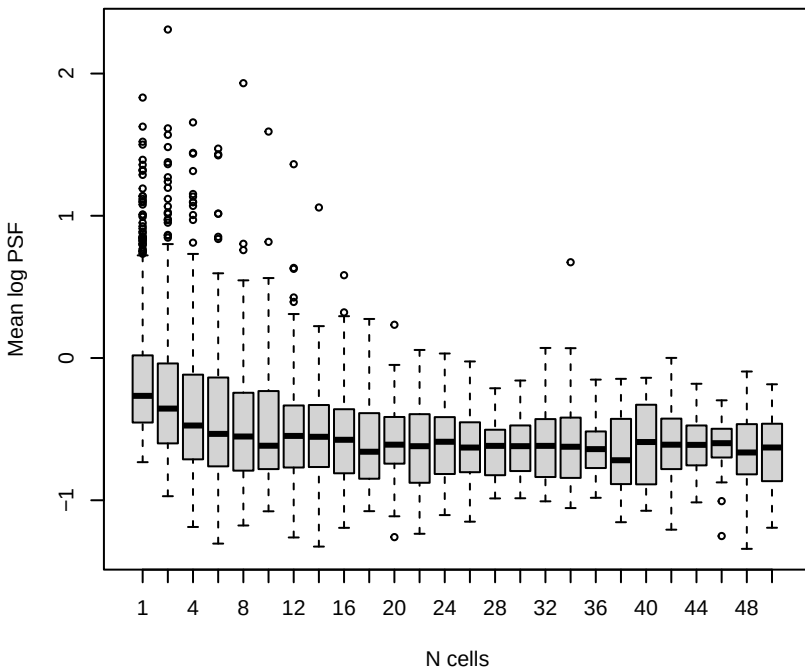


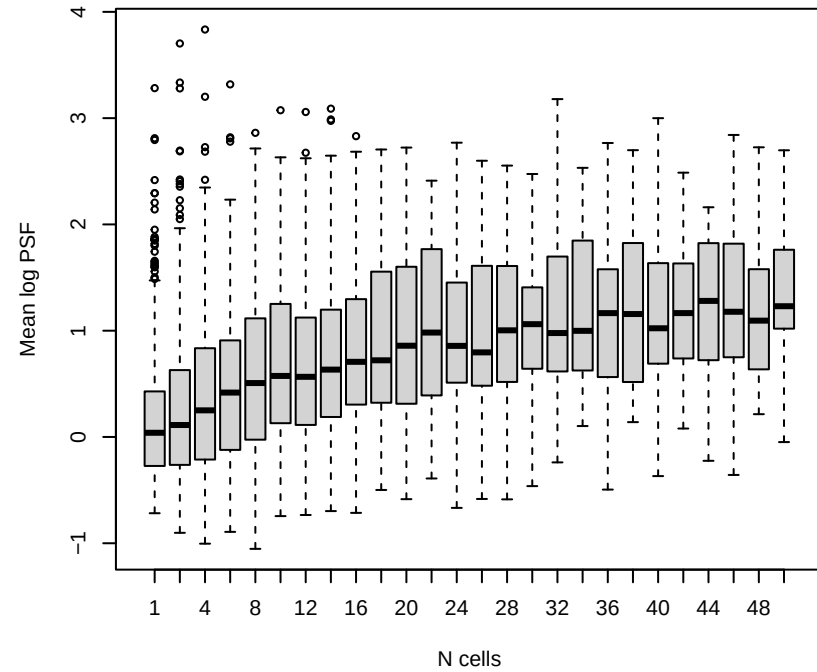
Overview of pathway activity stability across tissue types and pseudobulk sizes. This multi-page figure presents pathway-wise visualization of log2 mean activity values calculated using the PSF algorithm. Each page corresponds to a single pathway, displaying 8 boxplots representing different tissue types. Within each boxplot, box groups correspond to varying pseudobulk sizes that is, the number of cells aggregated to compute gene expression. This aggregation was applied to mitigate the impact of dropout events and zero-expression values common in single-cell data. Across most tissue types and pathways, the pathway activity values begin to stabilize when 10-12 or more cells are aggregated, suggesting this range is an effective threshold for reliable activity estimation in downstream analyses.



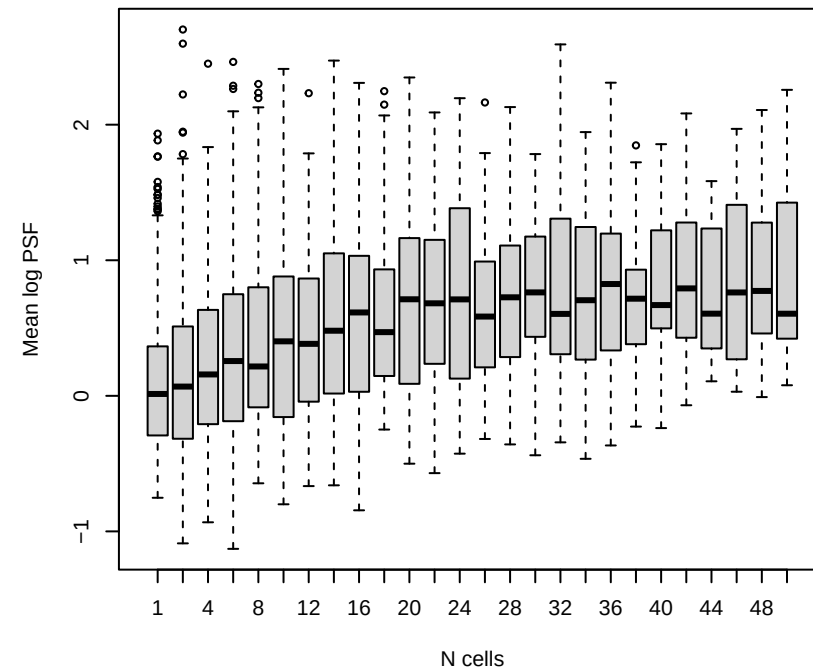
Apoptosis_skeletalmuscle



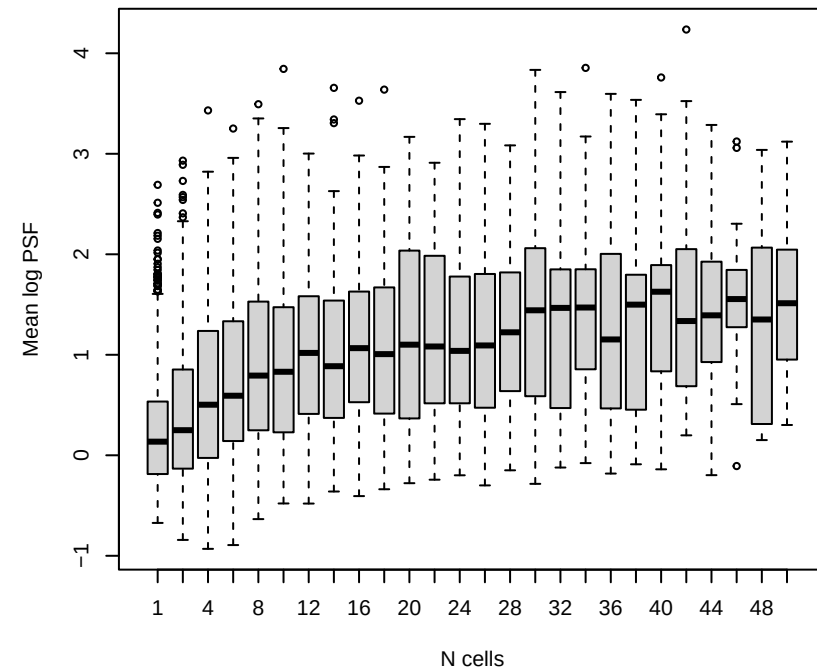
Apoptosis_esophagusmucosa



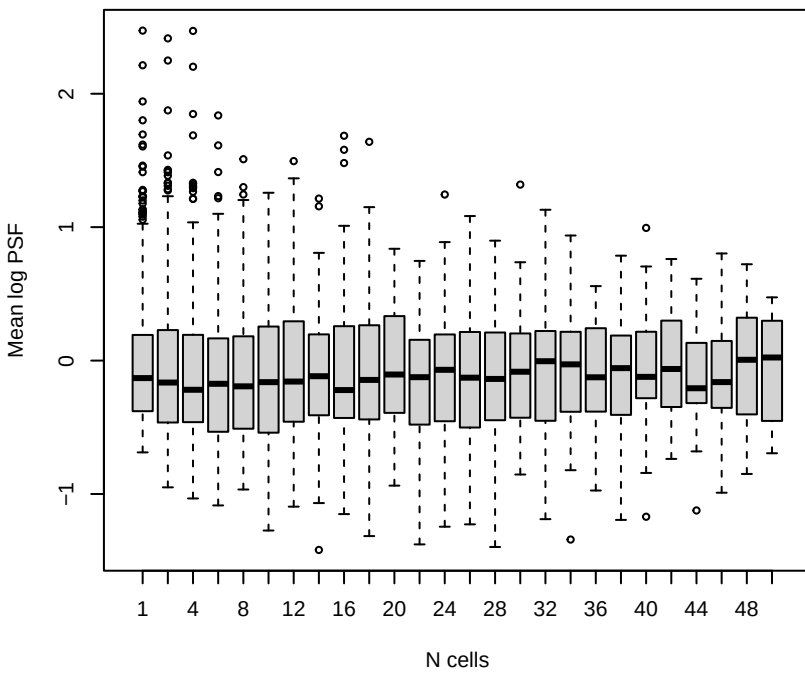
Apoptosis_heart



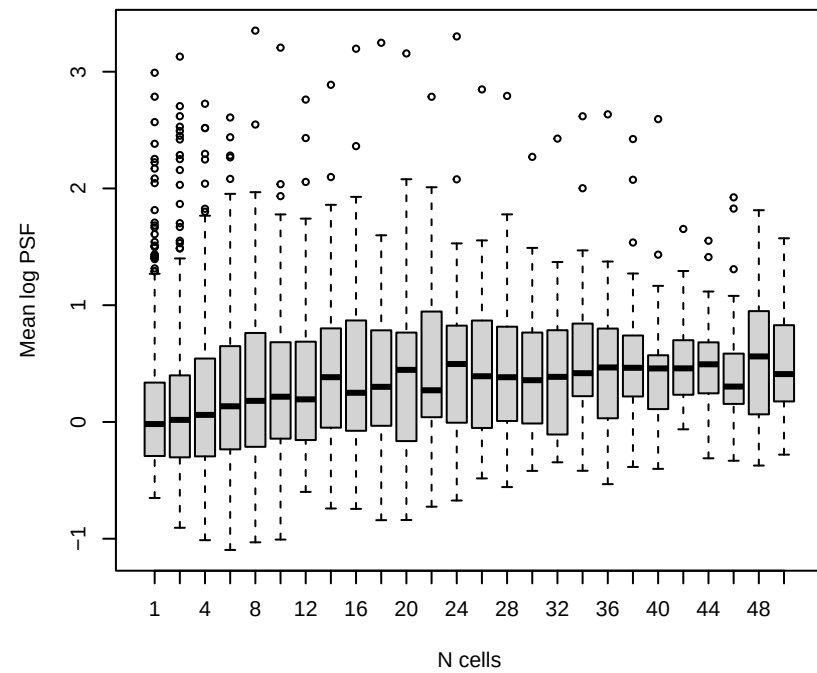
Apoptosis_prostate



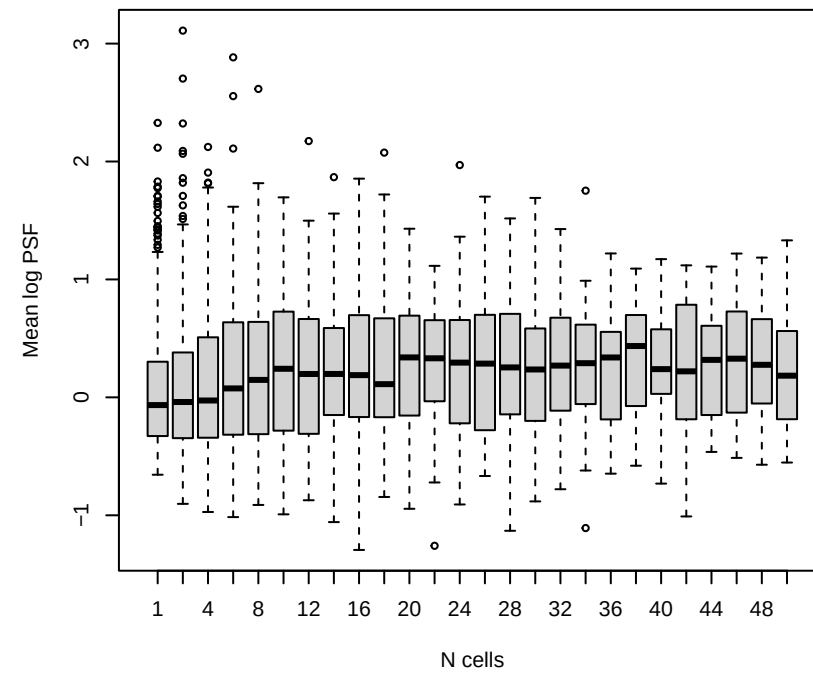
Apoptosis_breast



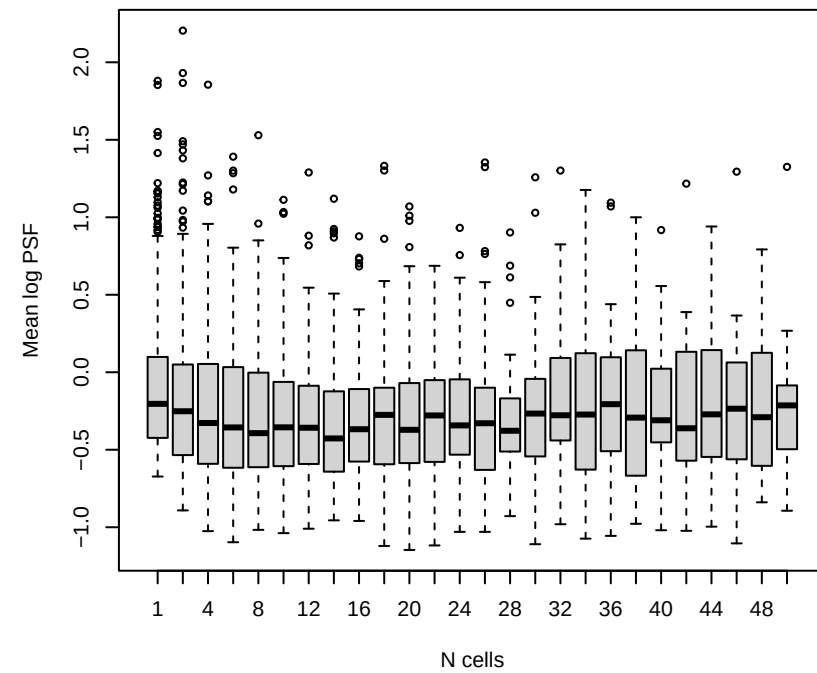
Apoptosis_esophagusmuscularis

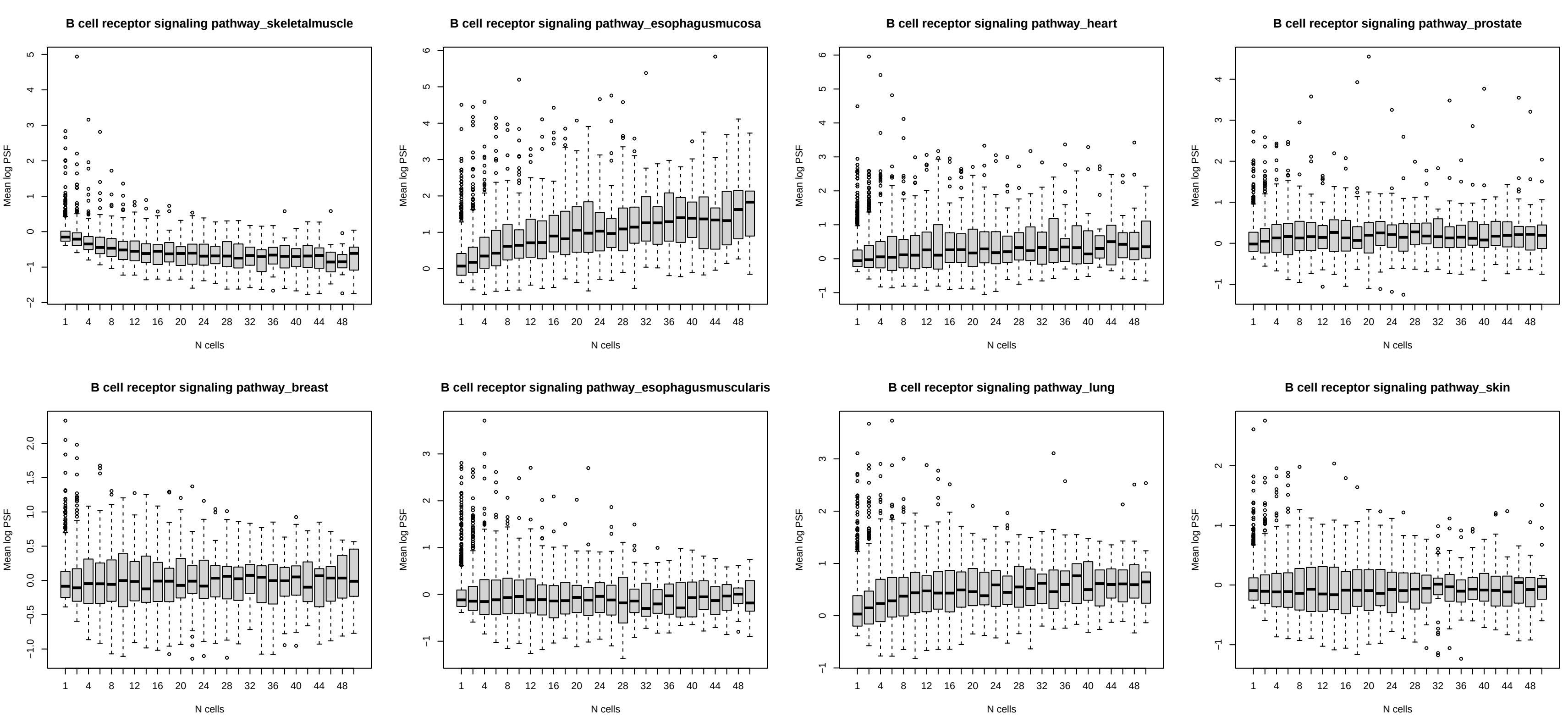


Apoptosis_lung

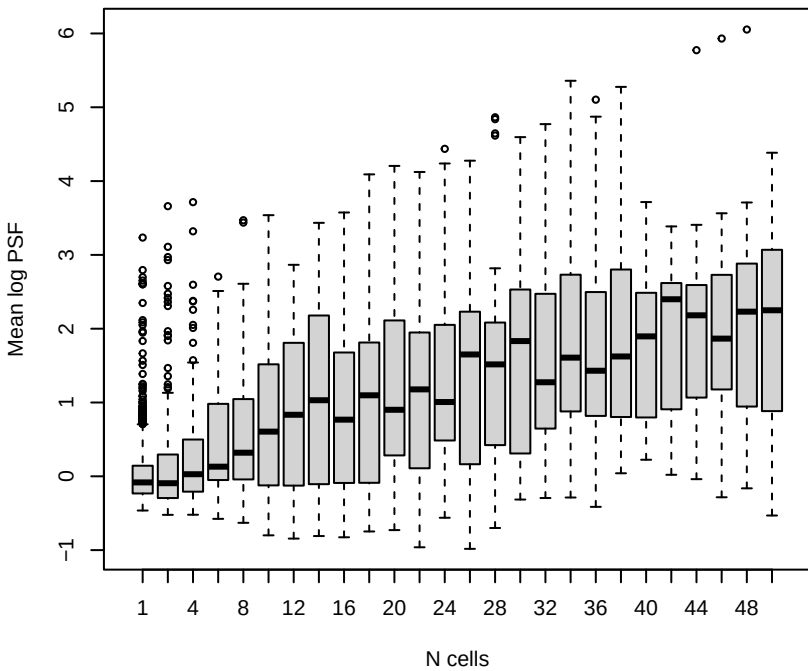


Apoptosis_skin

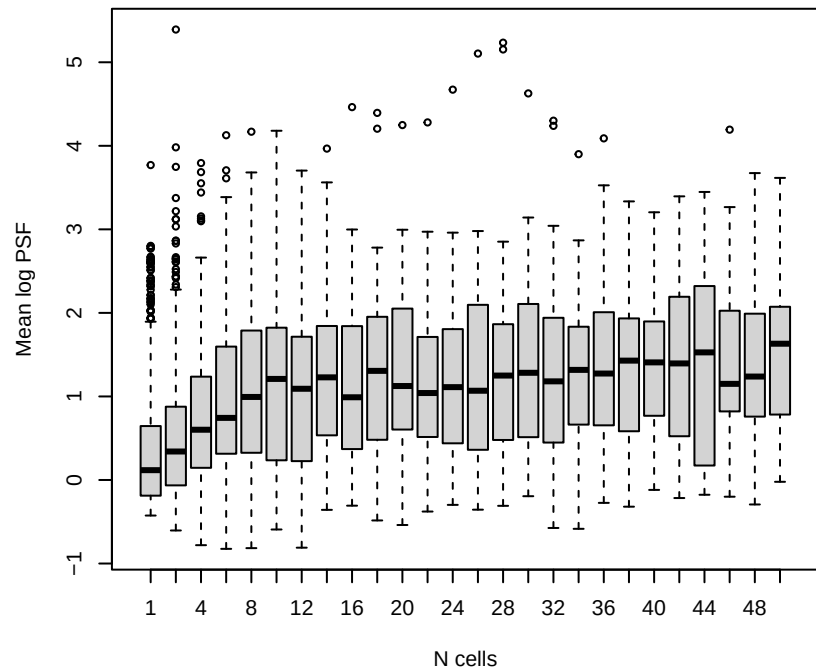




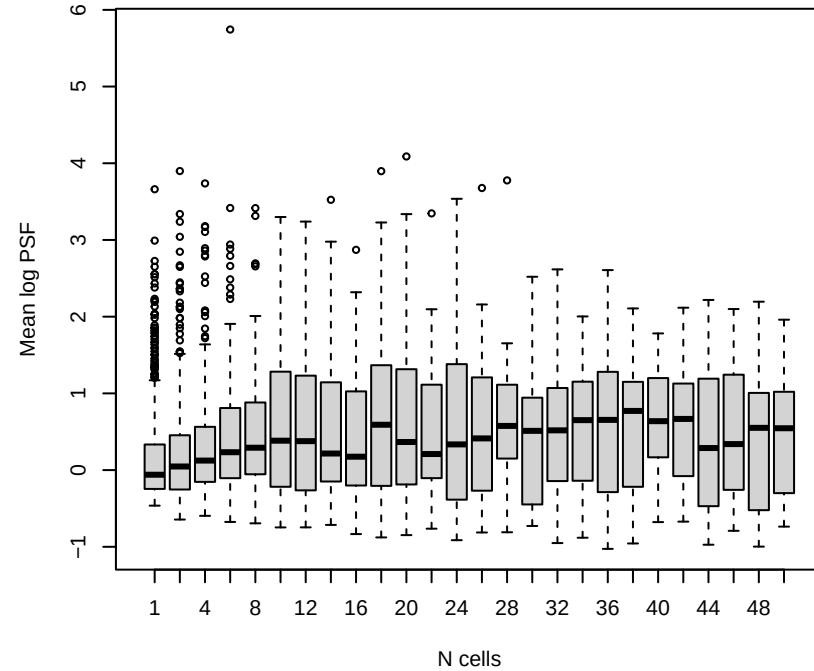
C-type lectin receptor signaling pathway_skeletalmuscle



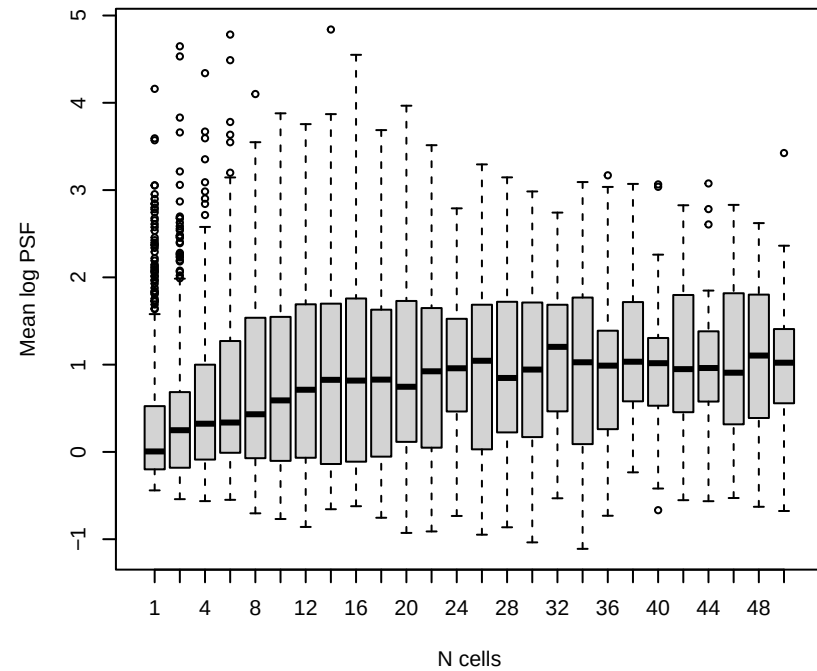
C-type lectin receptor signaling pathway_esophagasmucosa



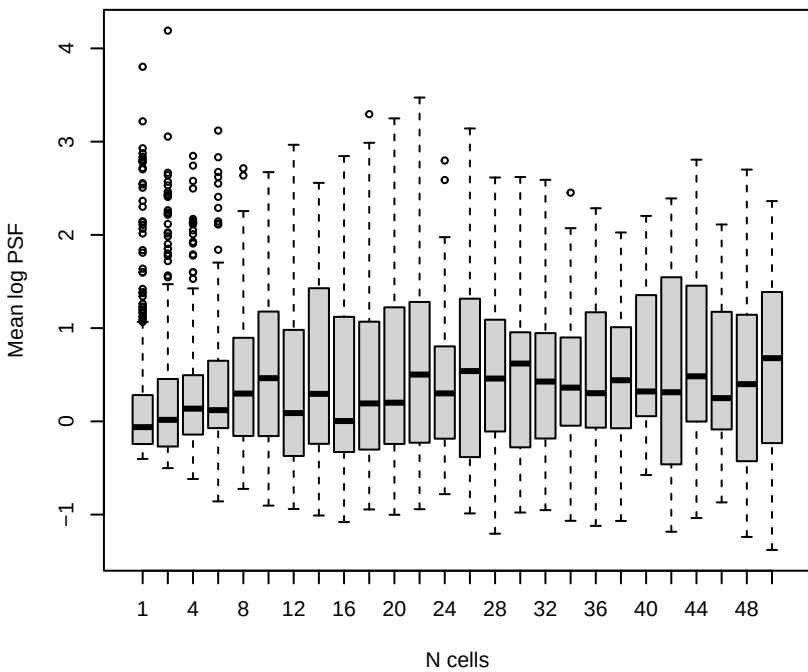
C-type lectin receptor signaling pathway_heart



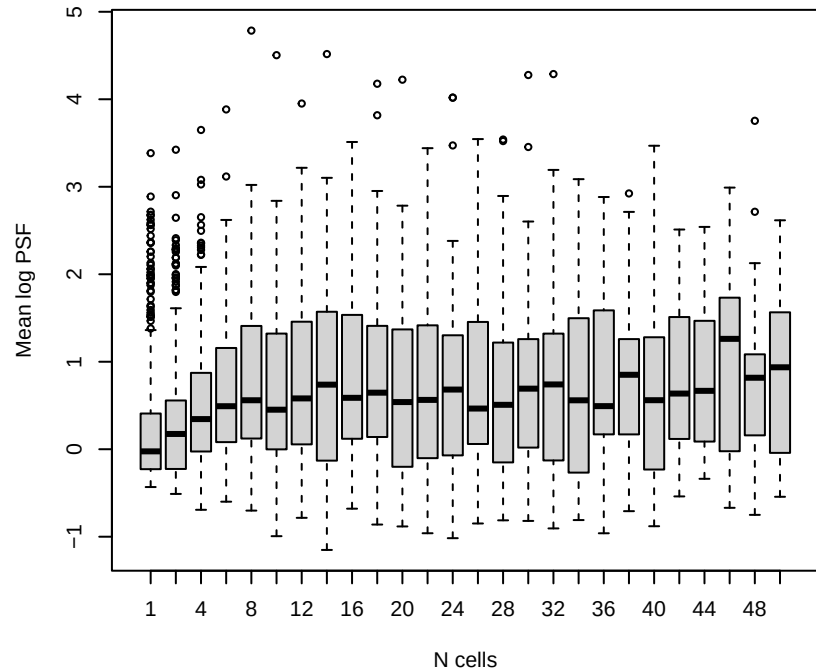
C-type lectin receptor signaling pathway_prostate



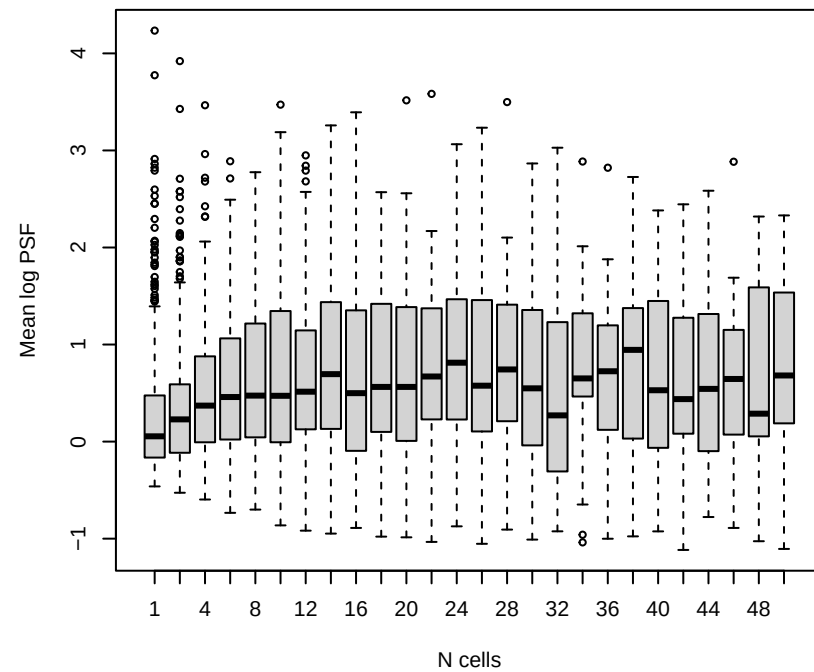
C-type lectin receptor signaling pathway_breast



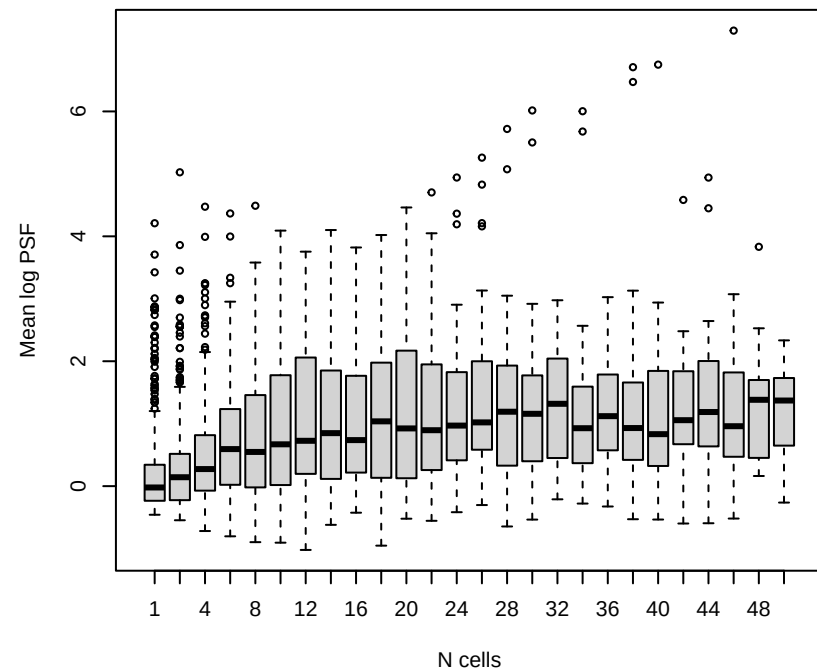
C-type lectin receptor signaling pathway_esophagusmuscularis



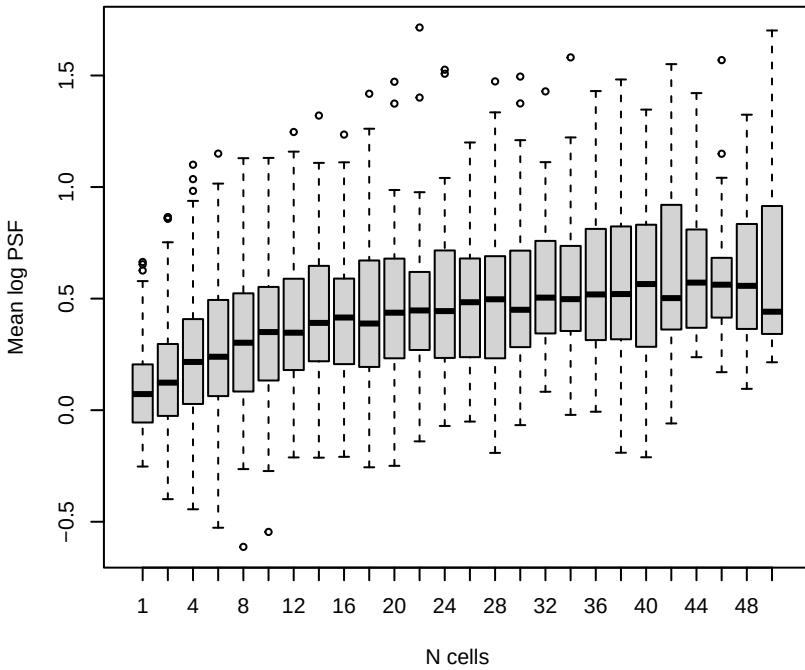
C-type lectin receptor signaling pathway_lung



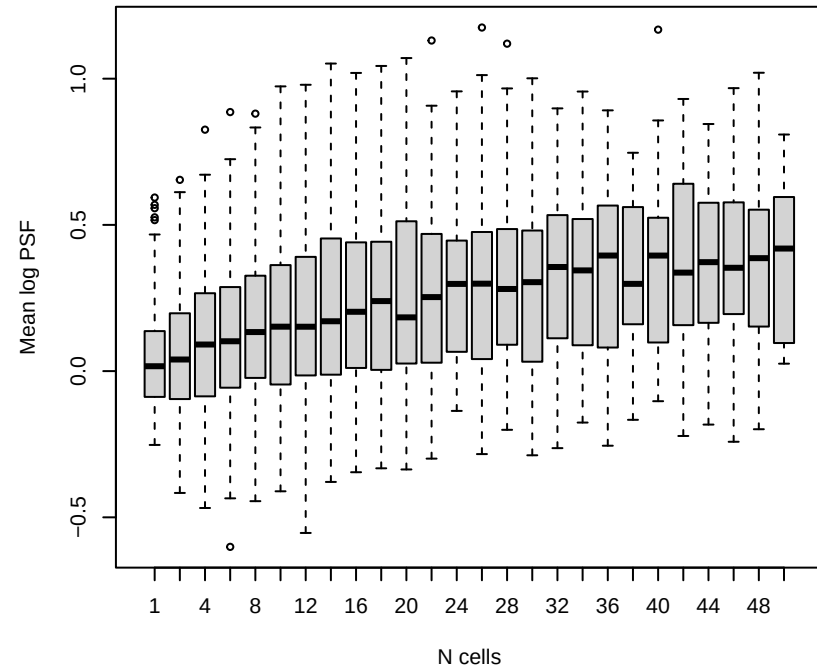
C-type lectin receptor signaling pathway_skin



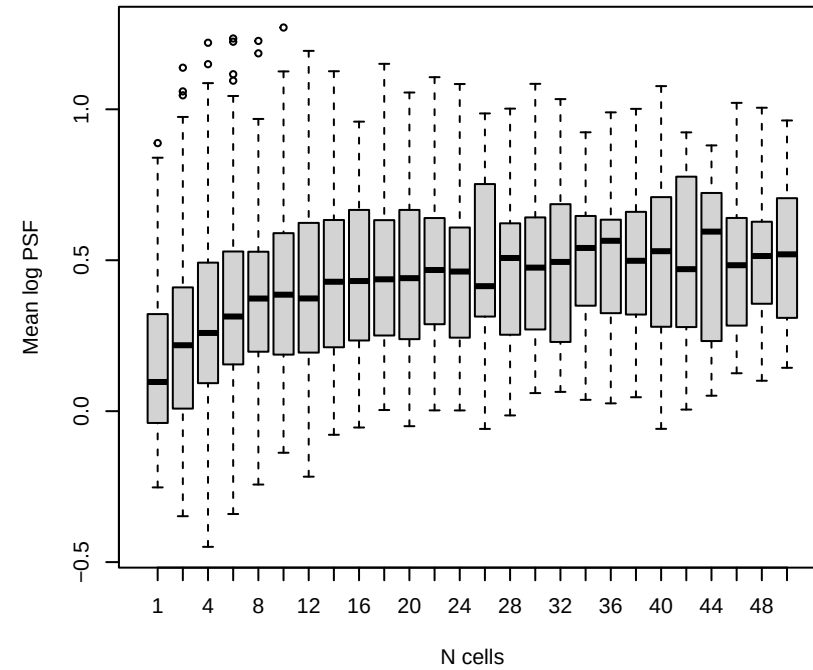
Calcium signaling pathway_skeletalmuscle



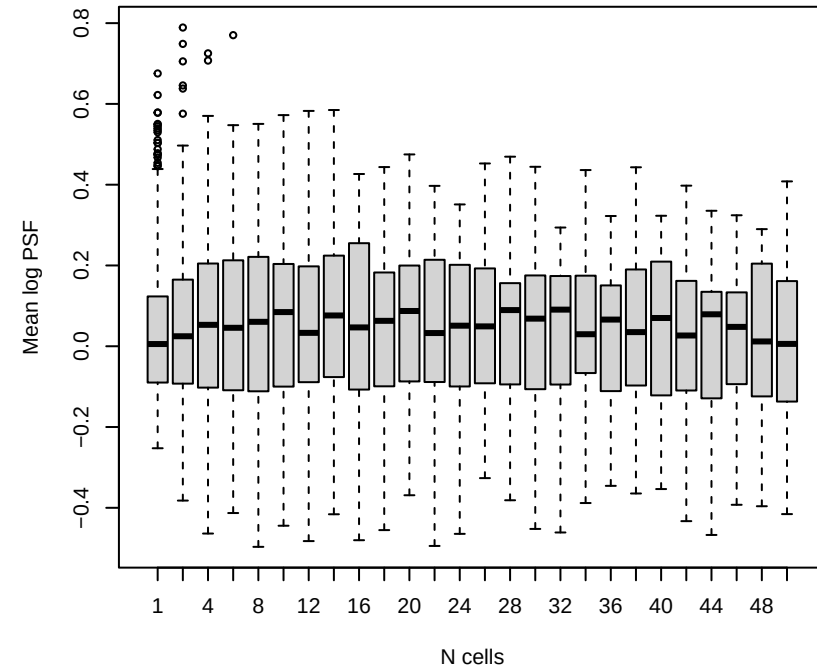
Calcium signaling pathway_esophagusmucosa



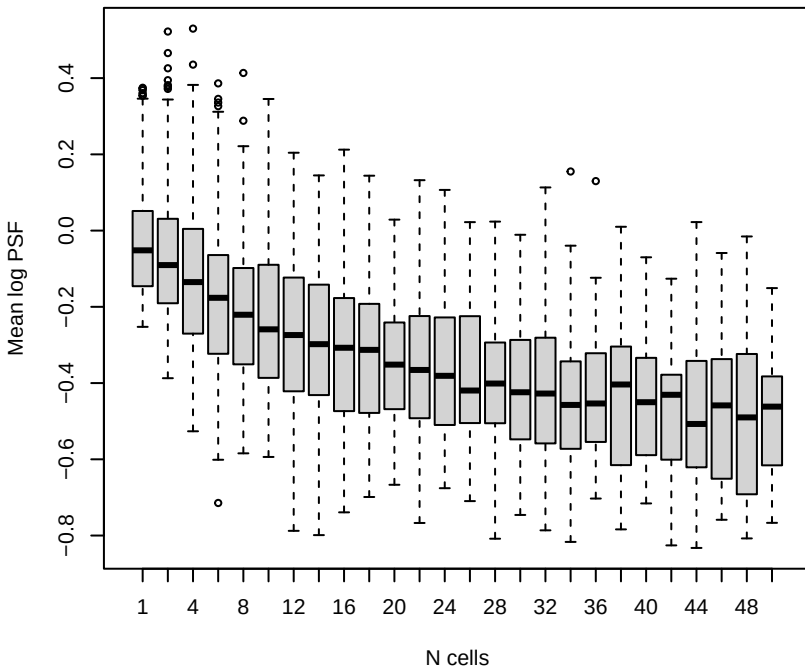
Calcium signaling pathway_heart



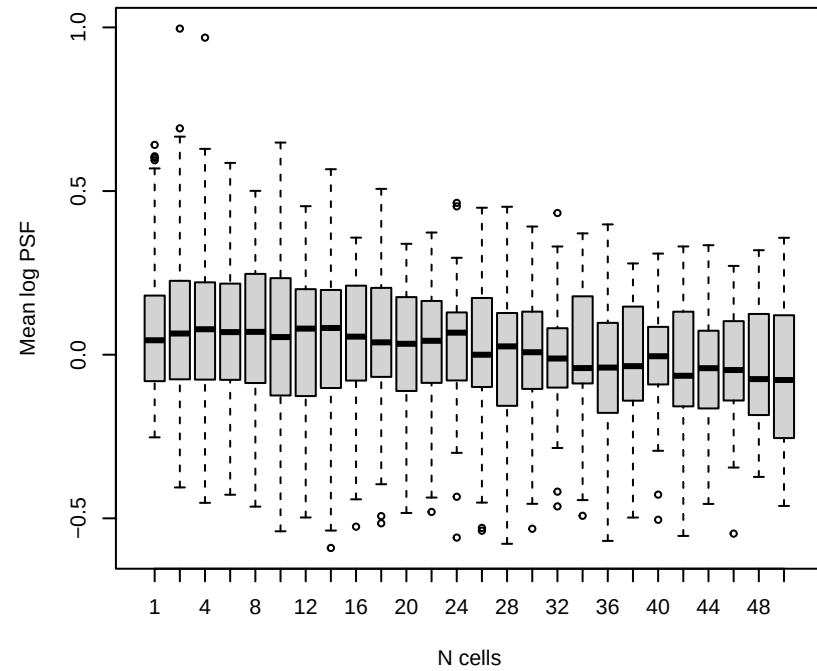
Calcium signaling pathway_prostate



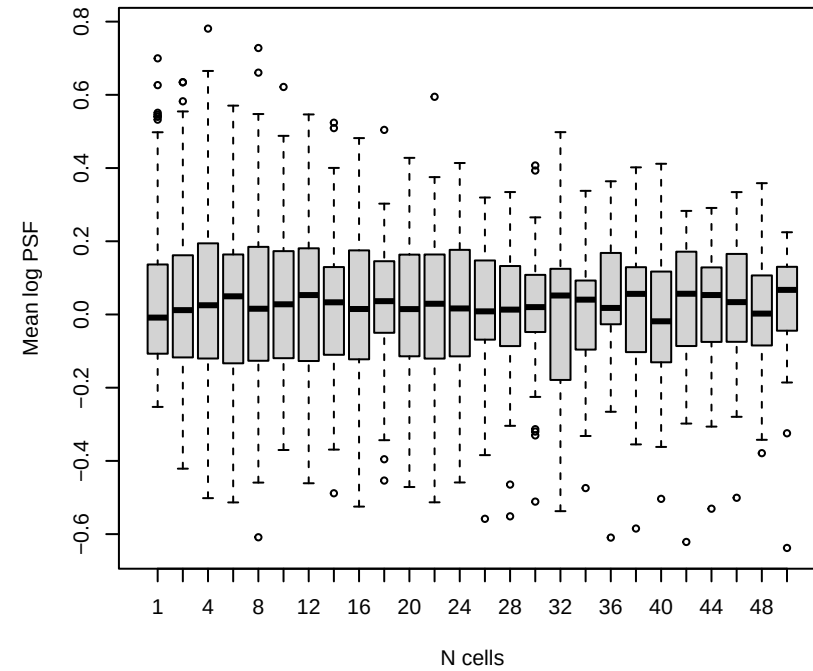
Calcium signaling pathway_breast



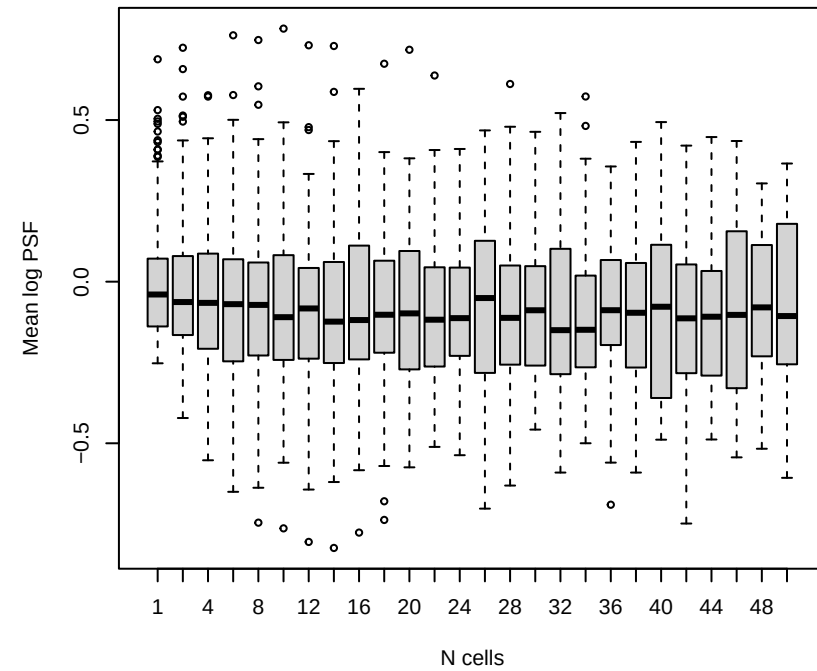
Calcium signaling pathway_esophagusmuscularis



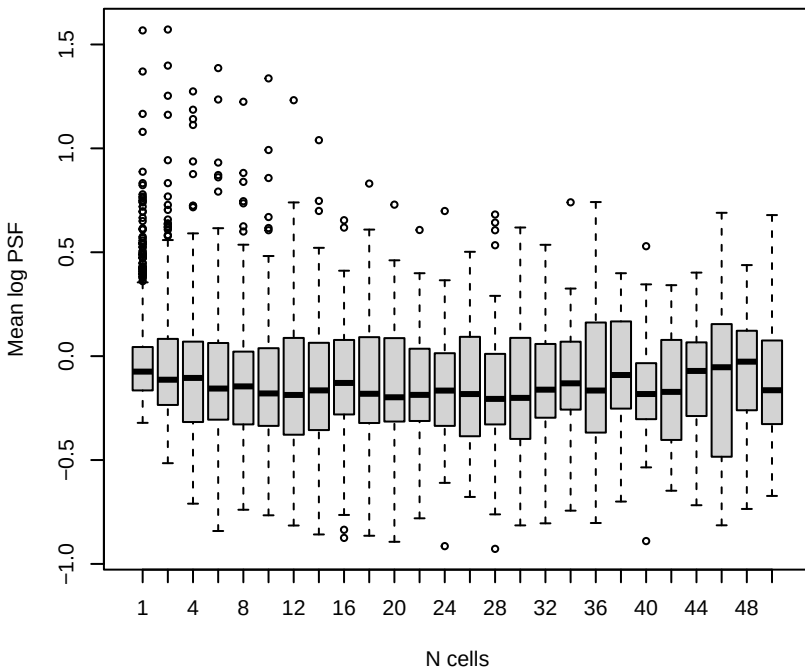
Calcium signaling pathway_lung



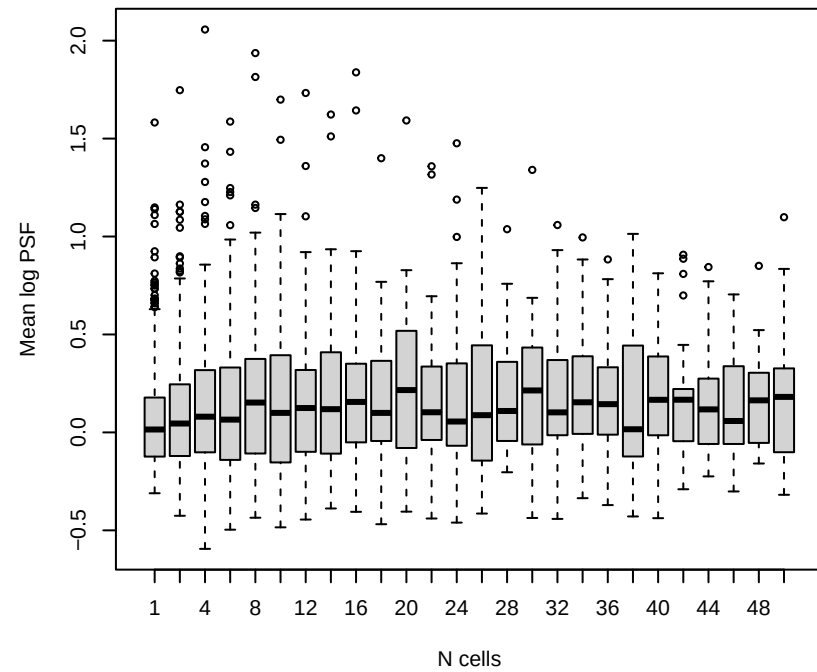
Calcium signaling pathway_skin



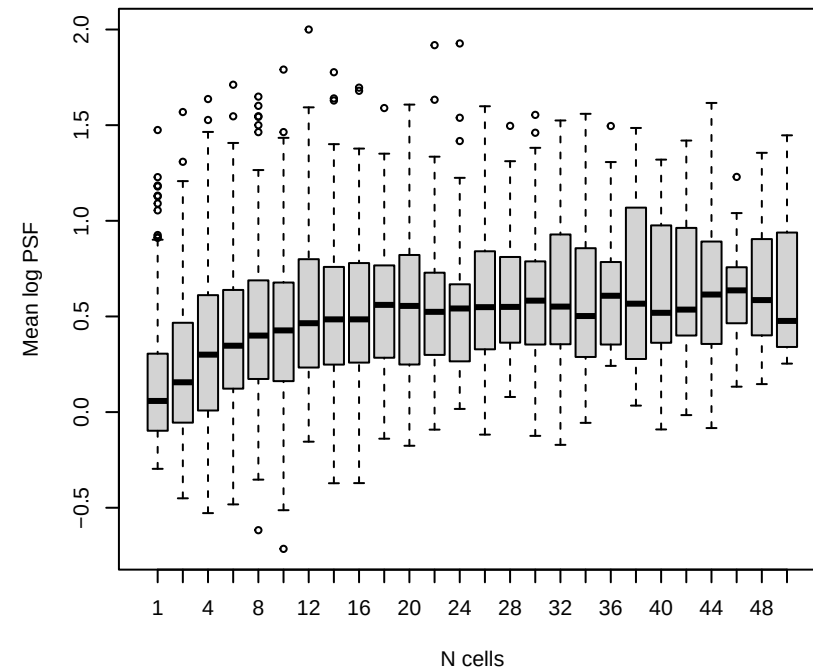
cAMP signaling pathway_skeletalmuscle



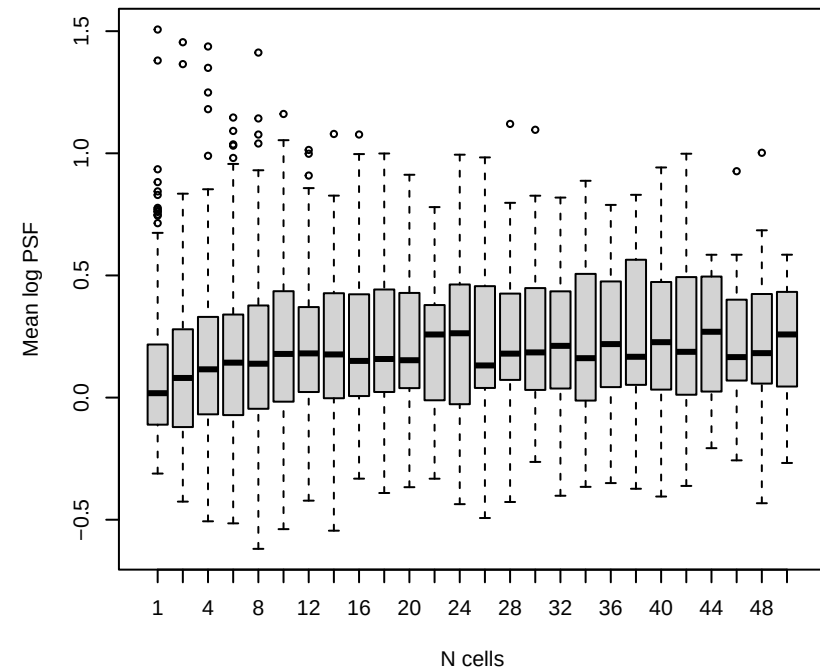
cAMP signaling pathway_esophagumucosa



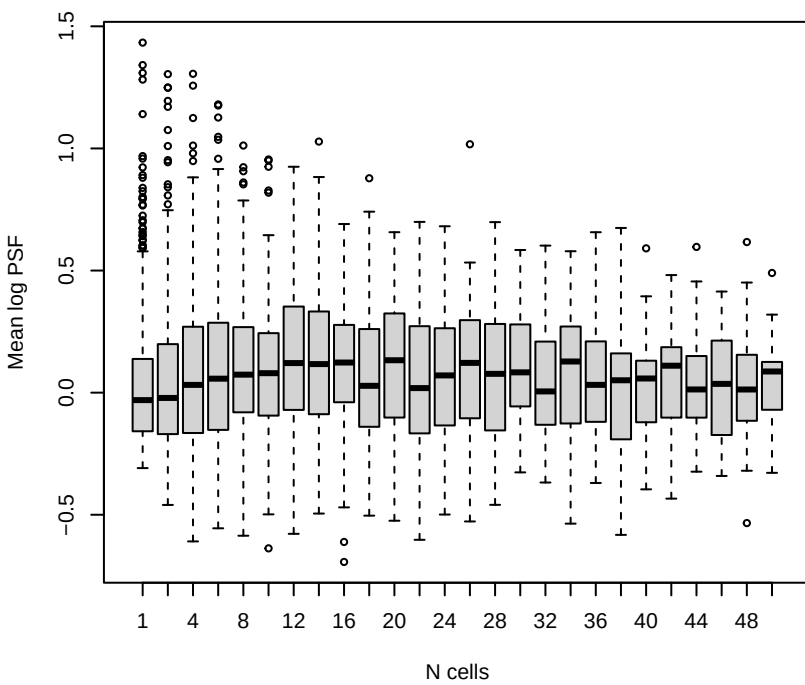
cAMP signaling pathway_heart



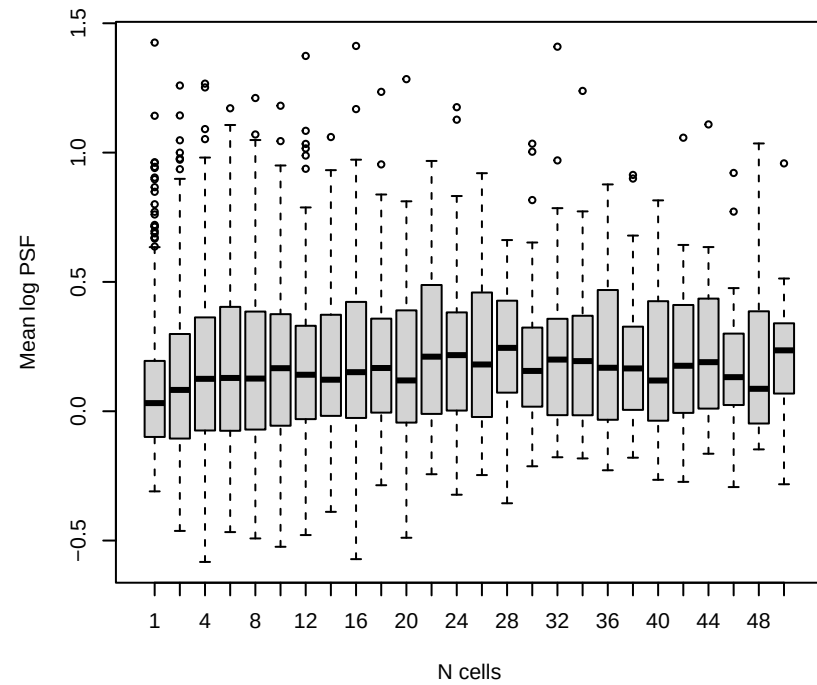
cAMP signaling pathway_prostate



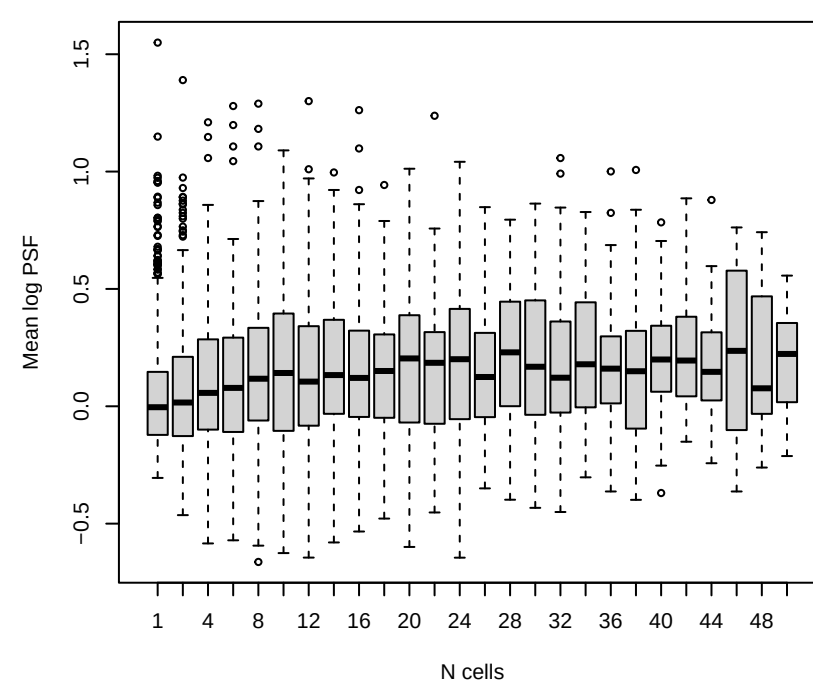
cAMP signaling pathway_breast



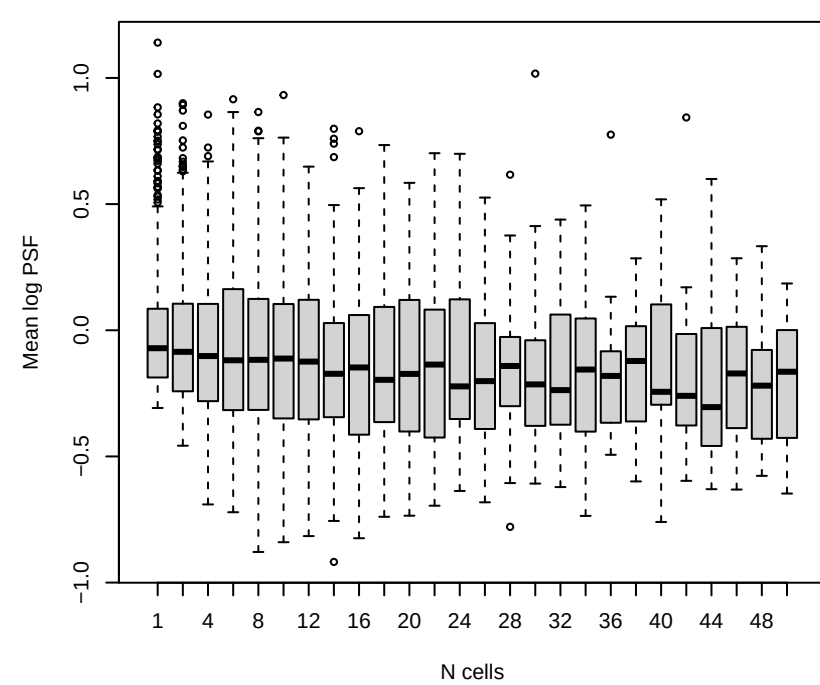
cAMP signaling pathway_esophagusmuscularis



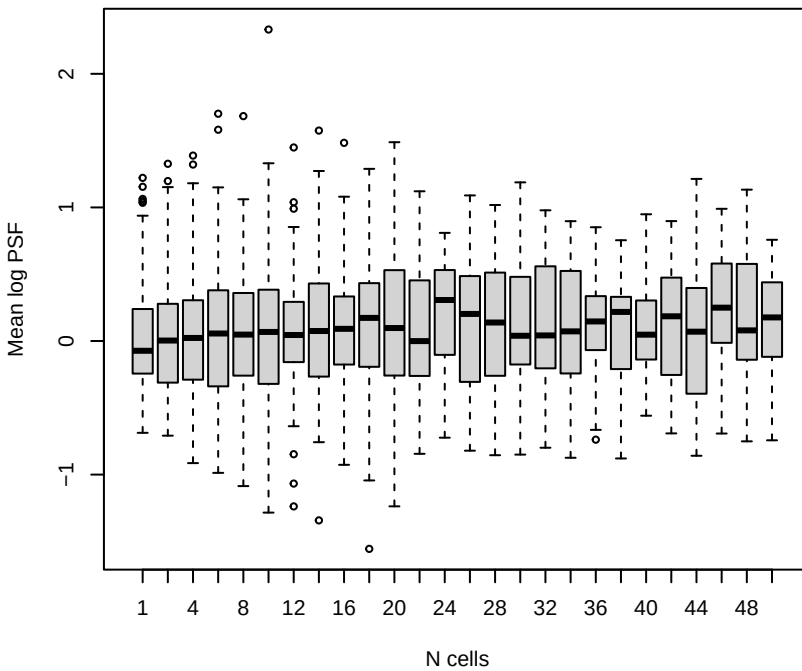
cAMP signaling pathway_lung



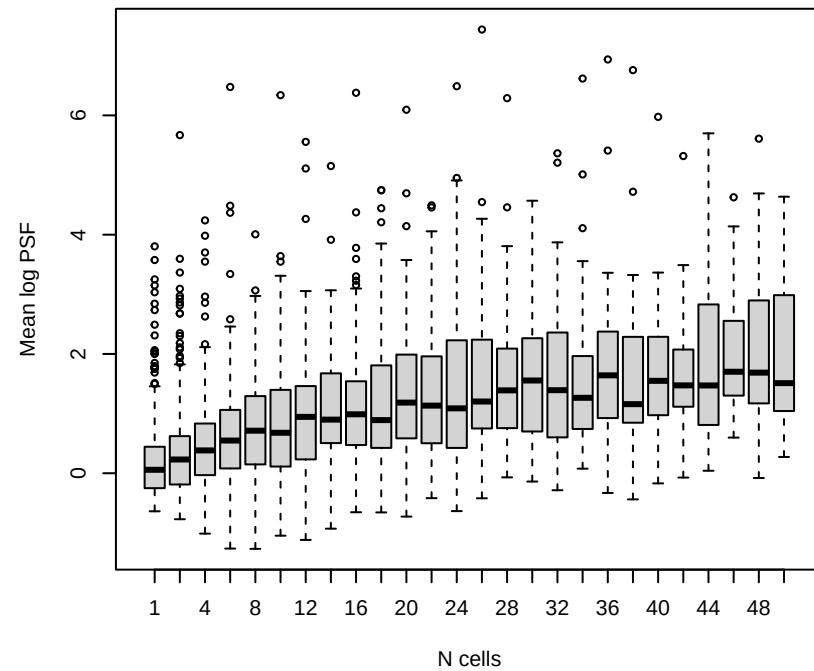
cAMP signaling pathway_skin



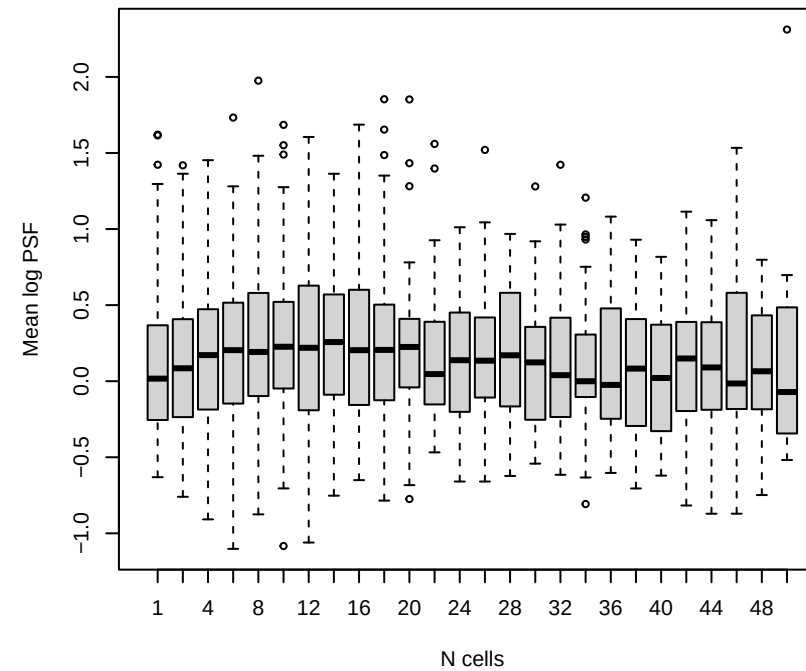
Cell cycle_skeletalmuscle



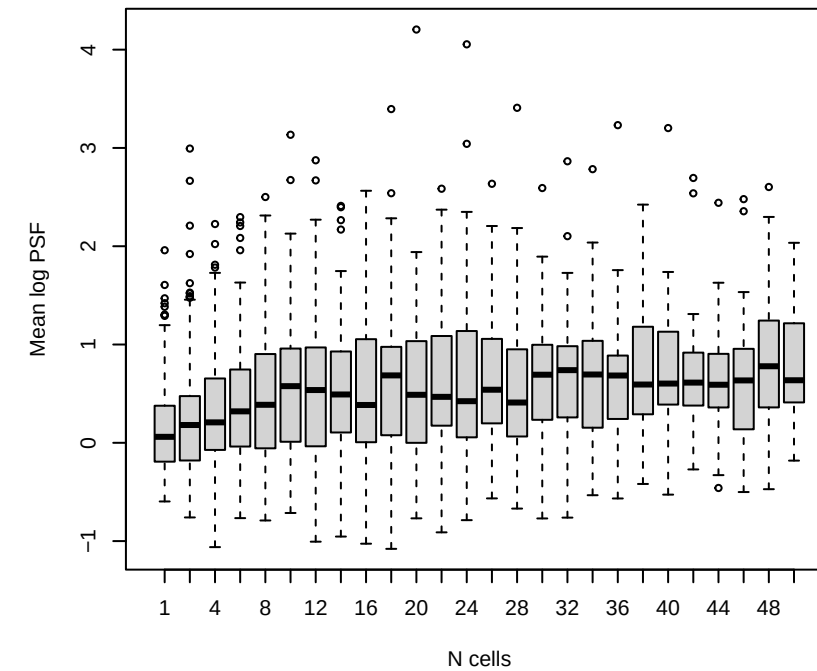
Cell cycle_esophagasmucosa



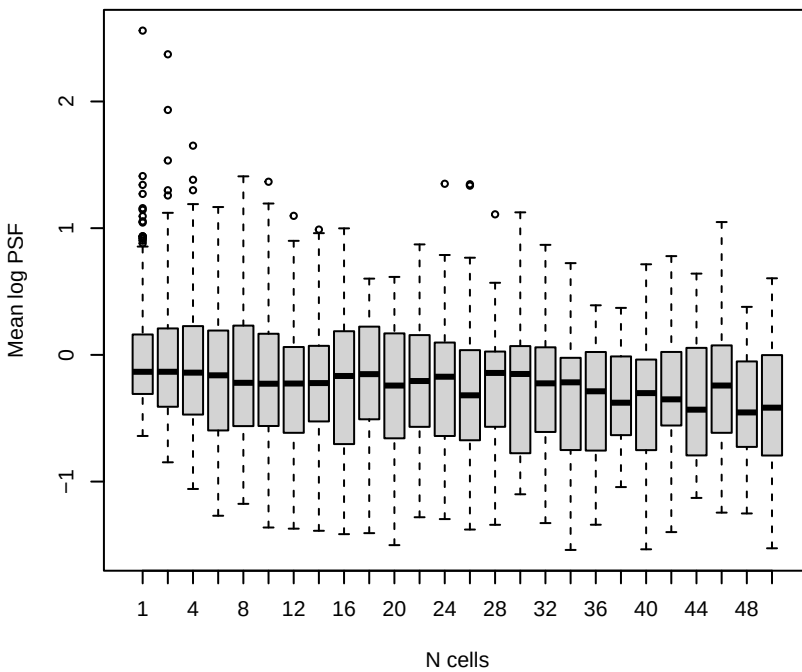
Cell cycle_heart



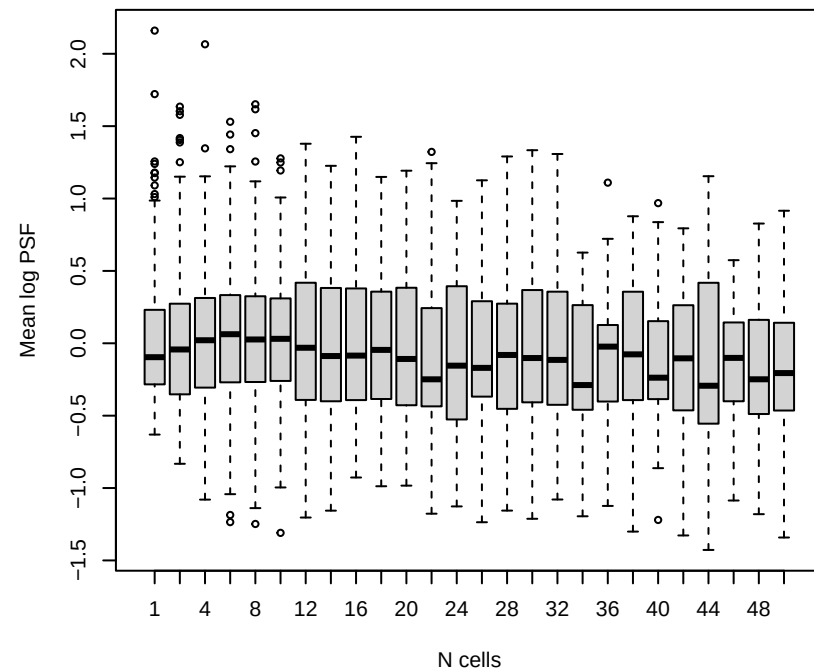
Cell cycle_prostate



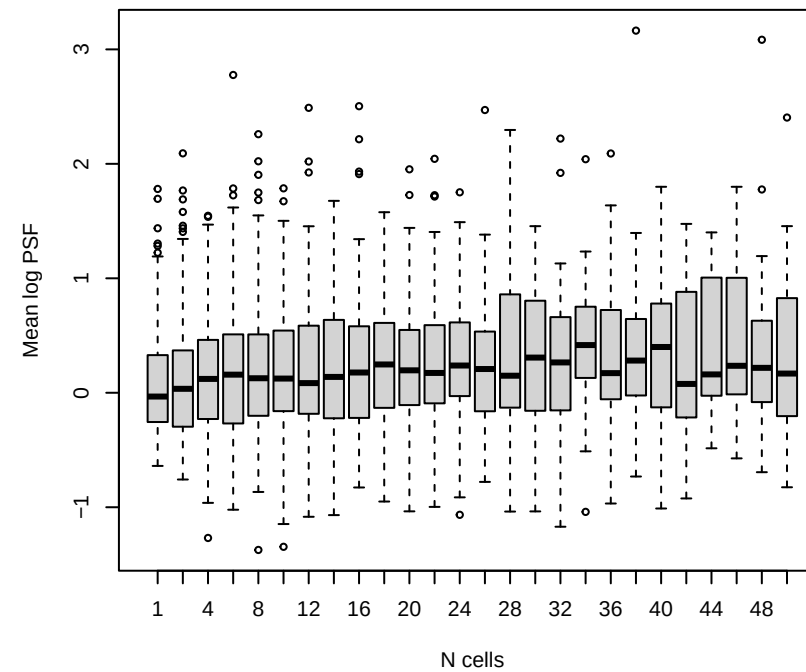
Cell cycle_breast



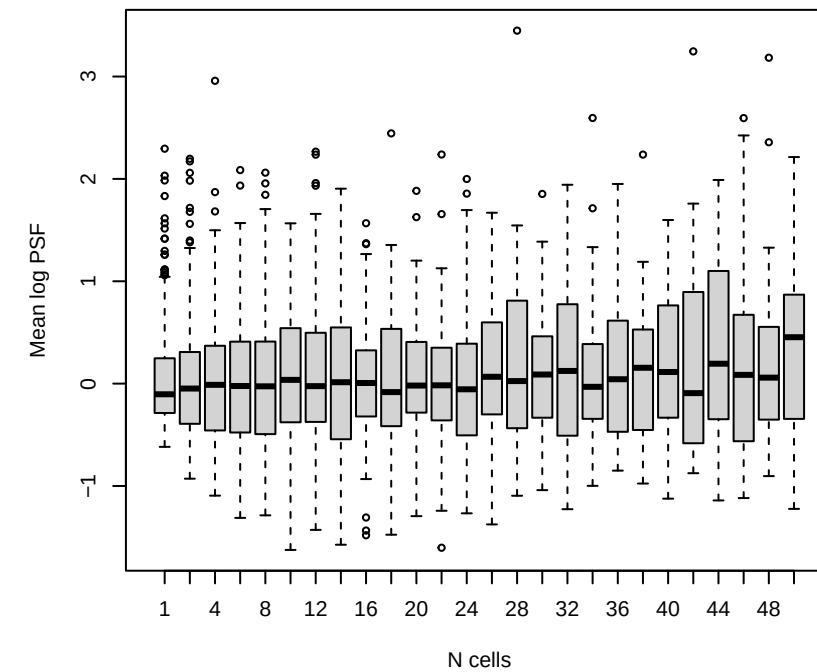
Cell cycle_esophagusmuscularis



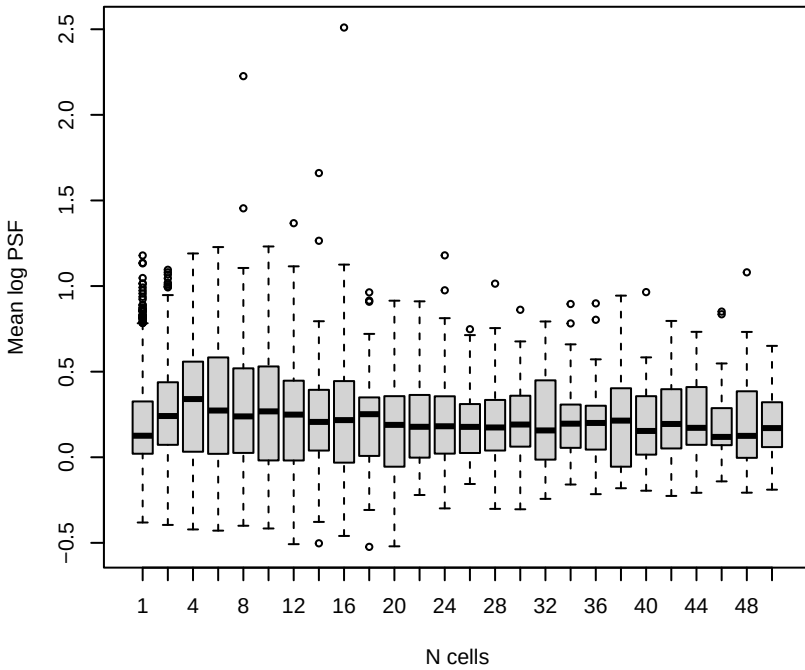
Cell cycle_lung



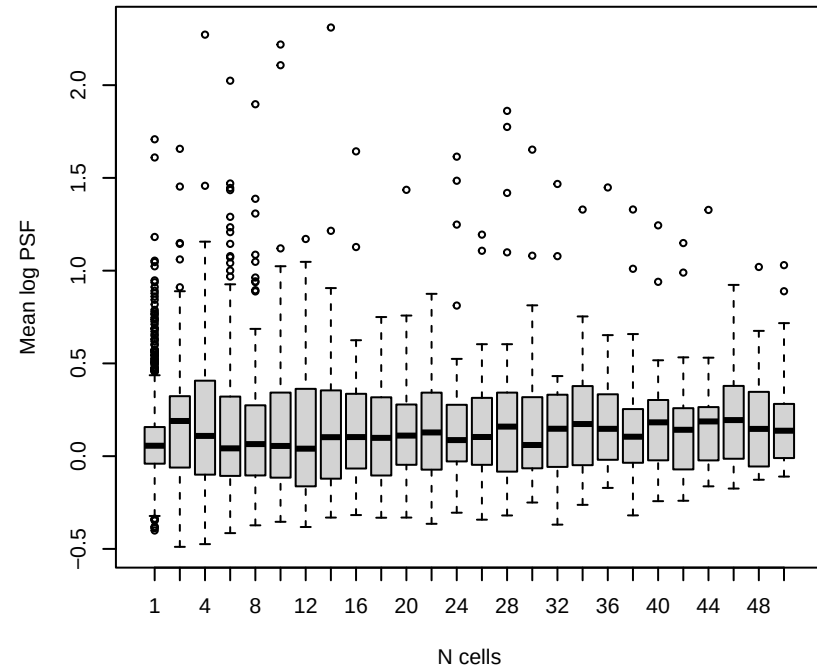
Cell cycle_skin



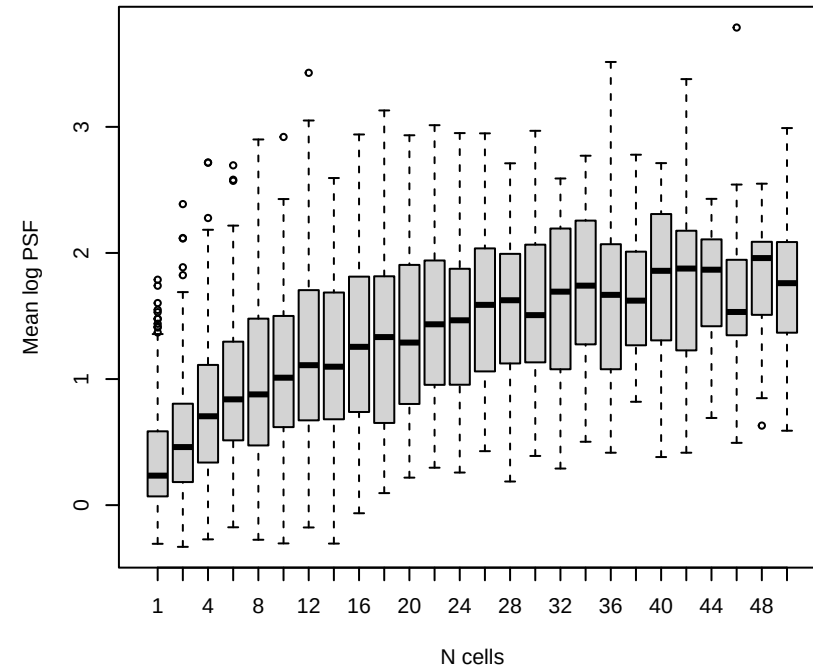
cGMP-PKG signaling pathway_skeletalmuscle



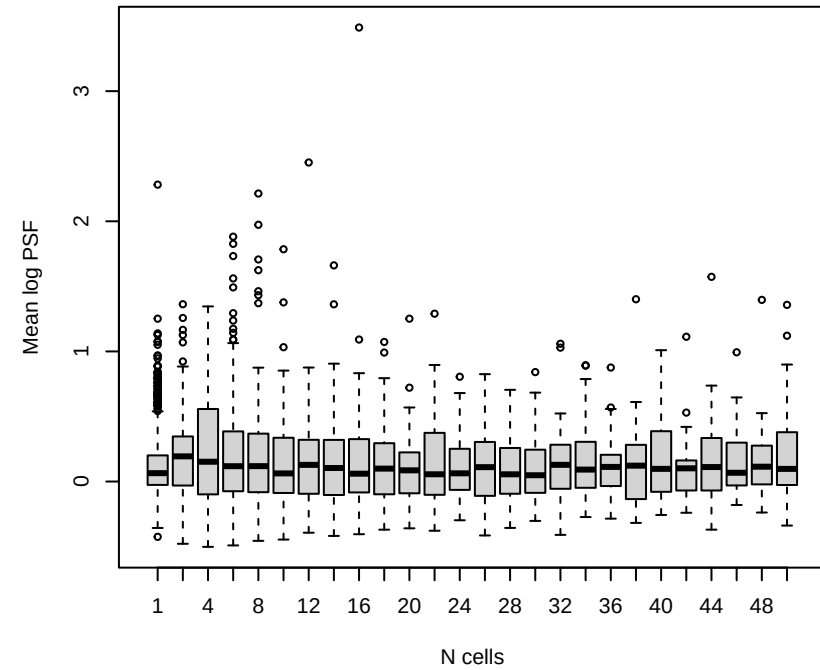
cGMP-PKG signaling pathway_esophagusmucosa



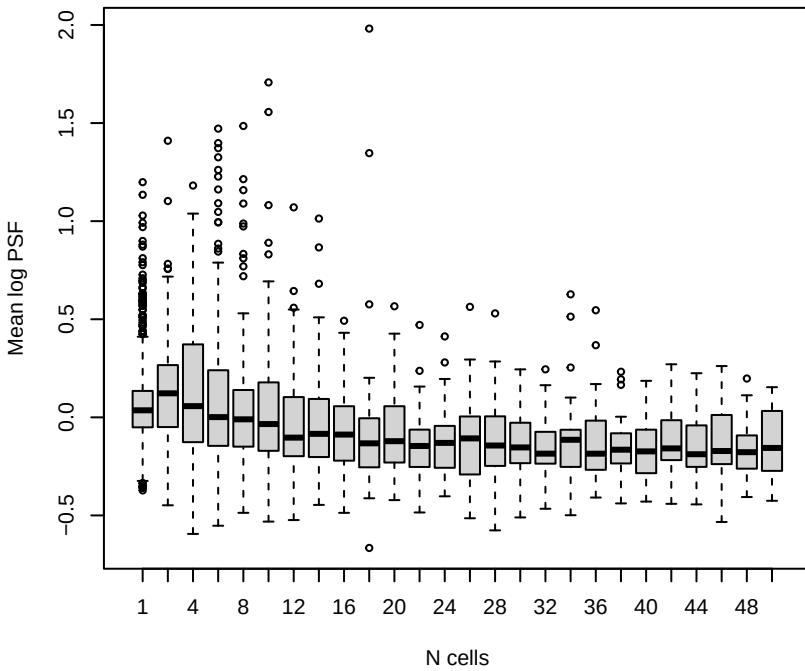
cGMP-PKG signaling pathway_heart



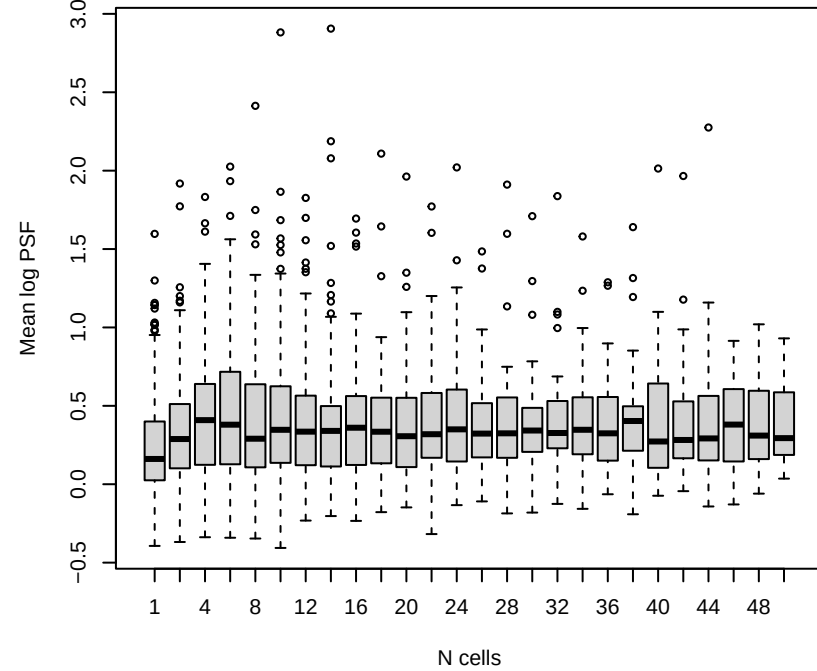
cGMP-PKG signaling pathway_prostate



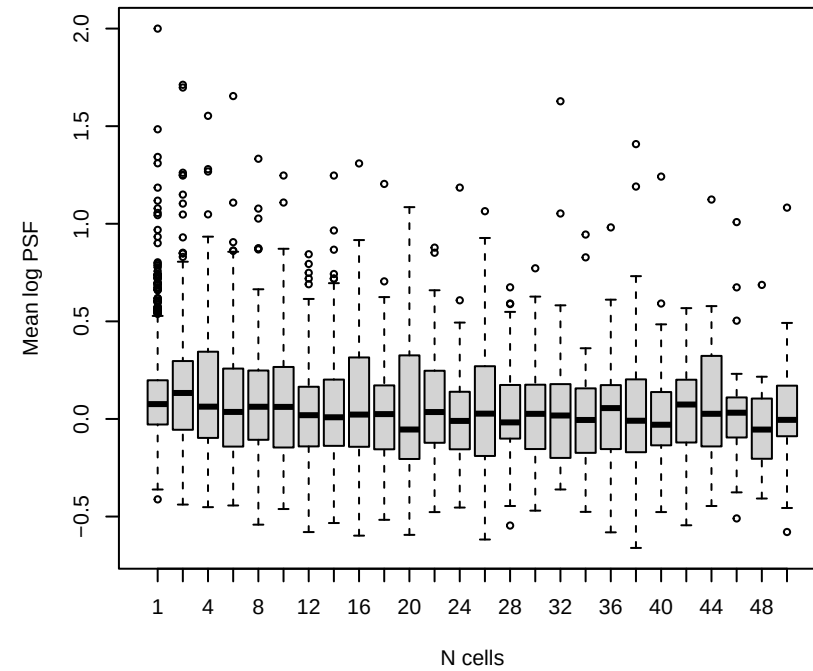
cGMP-PKG signaling pathway_breast



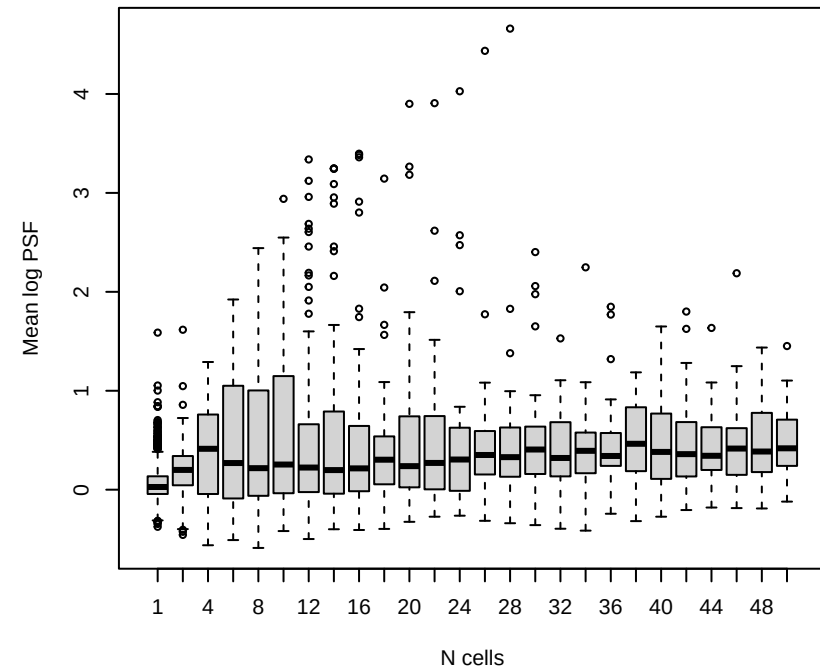
cGMP-PKG signaling pathway_esophagusmuscularis



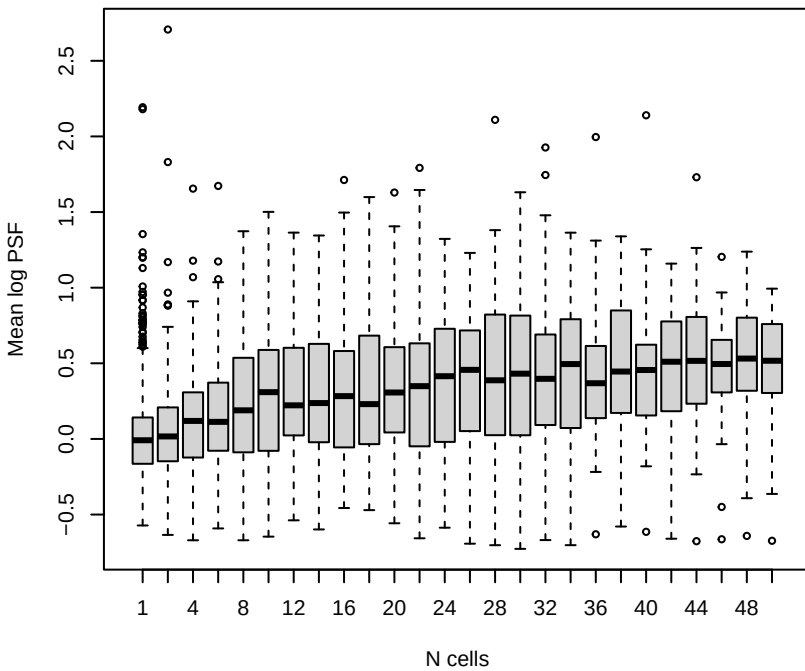
cGMP-PKG signaling pathway_lung



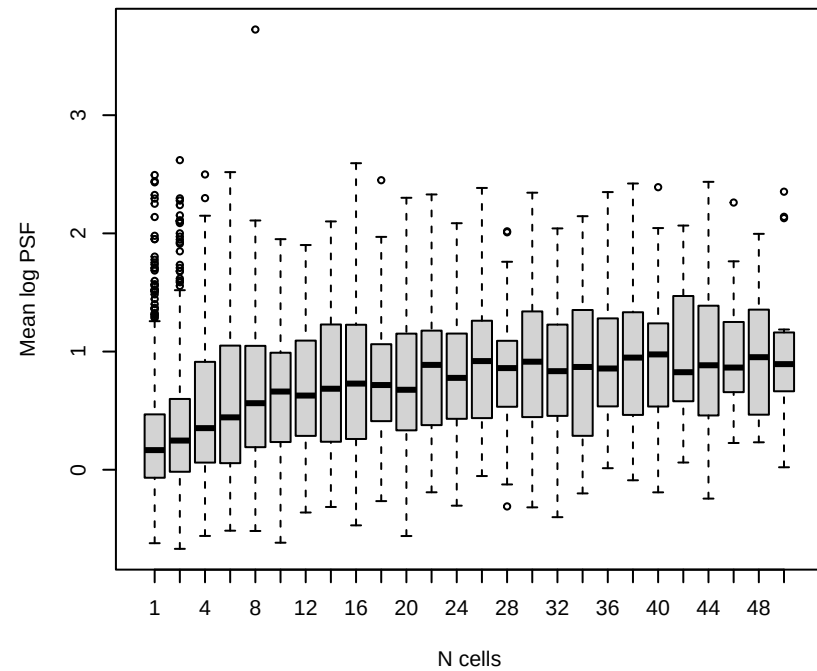
cGMP-PKG signaling pathway_skin



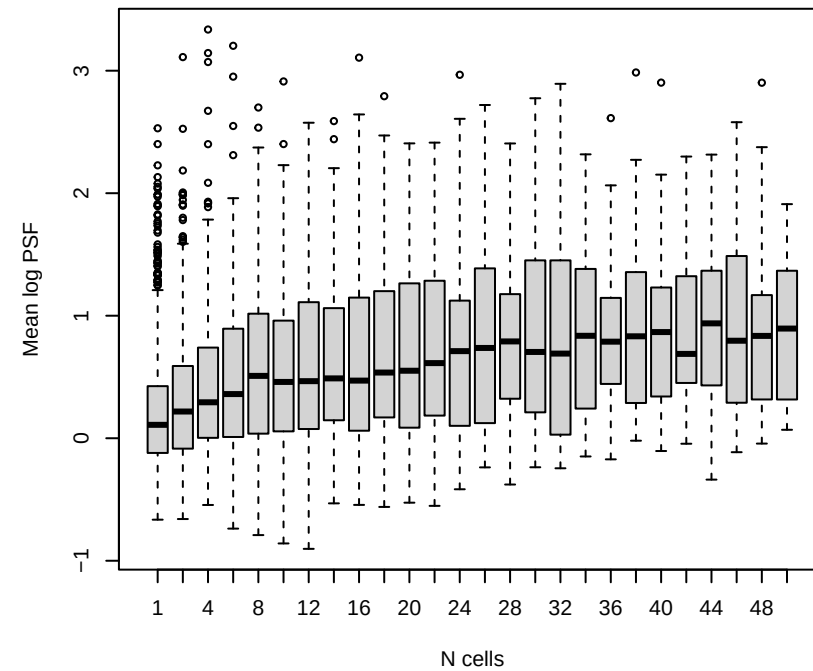
Chemokine signaling pathway_skeletalmuscle



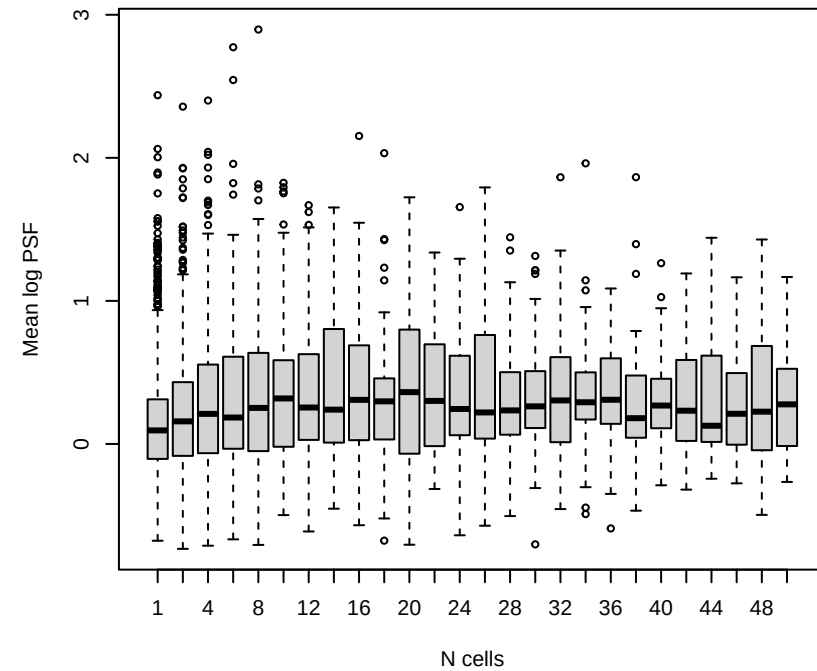
Chemokine signaling pathway_esophagasmucosa



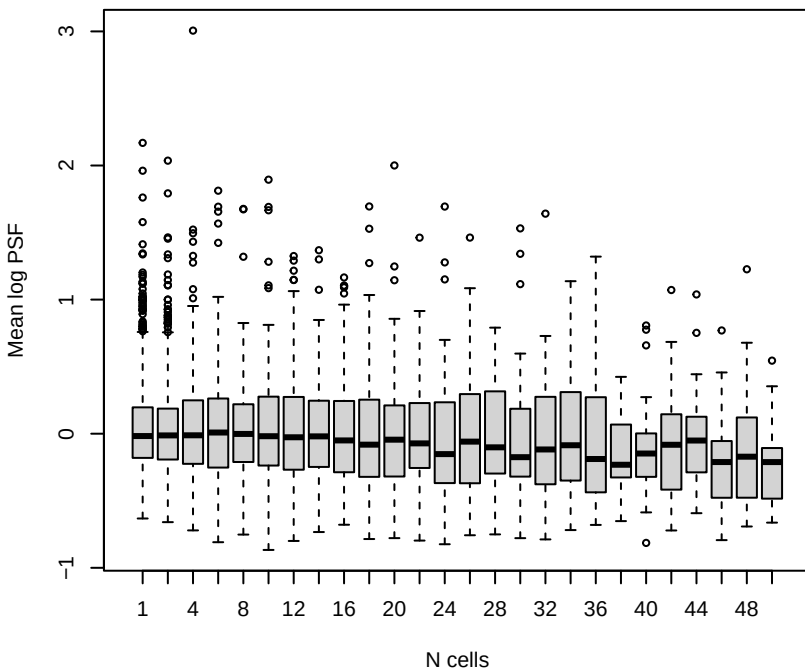
Chemokine signaling pathway_heart



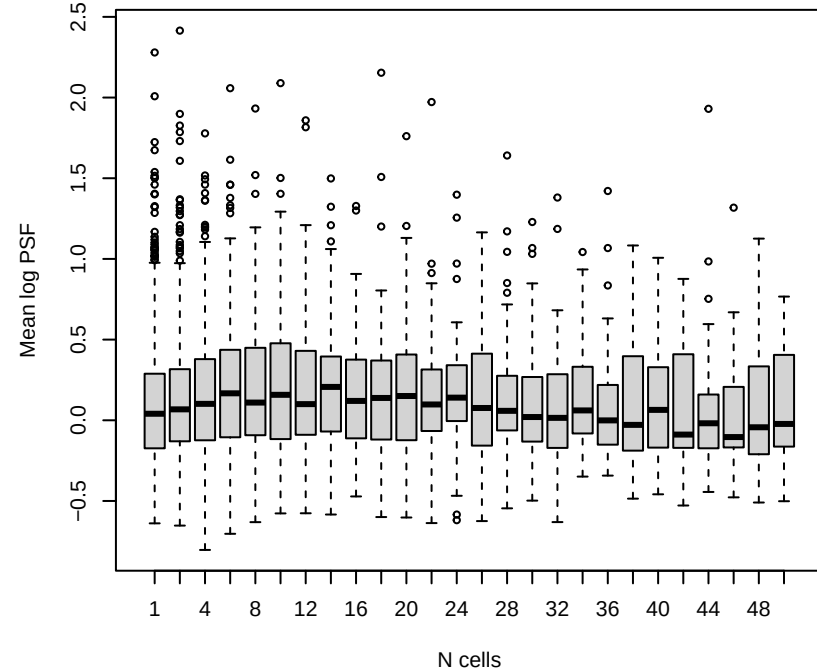
Chemokine signaling pathway_prostate



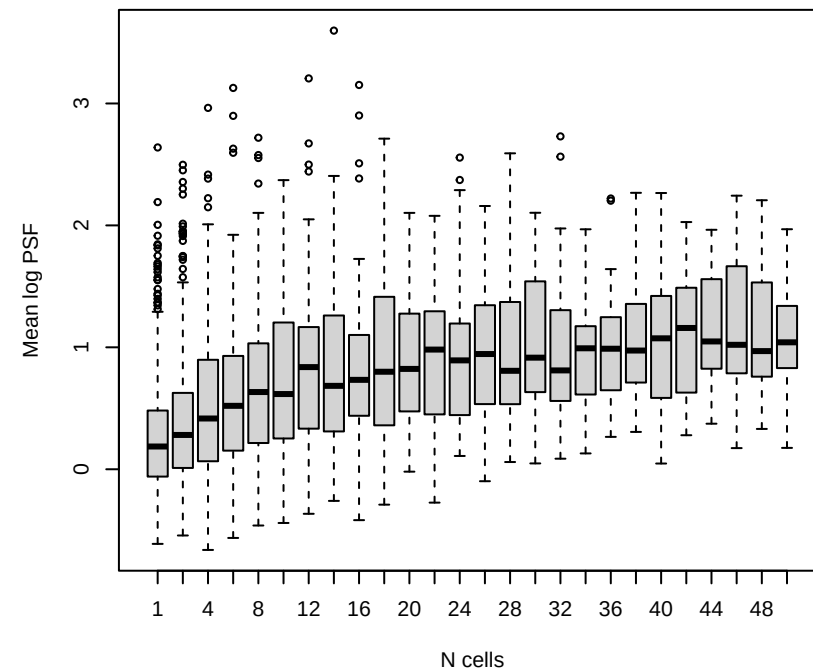
Chemokine signaling pathway_breast



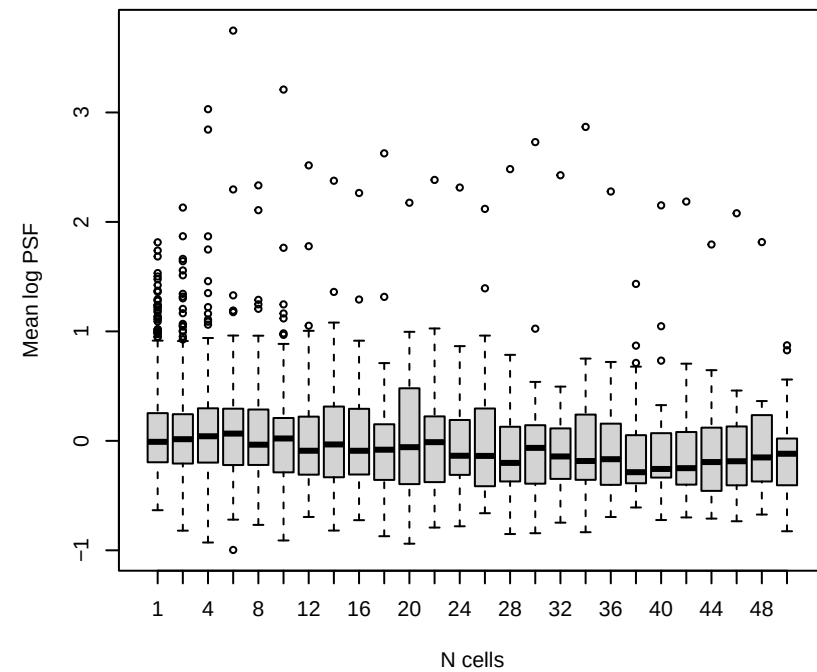
Chemokine signaling pathway_esophagusmuscularis



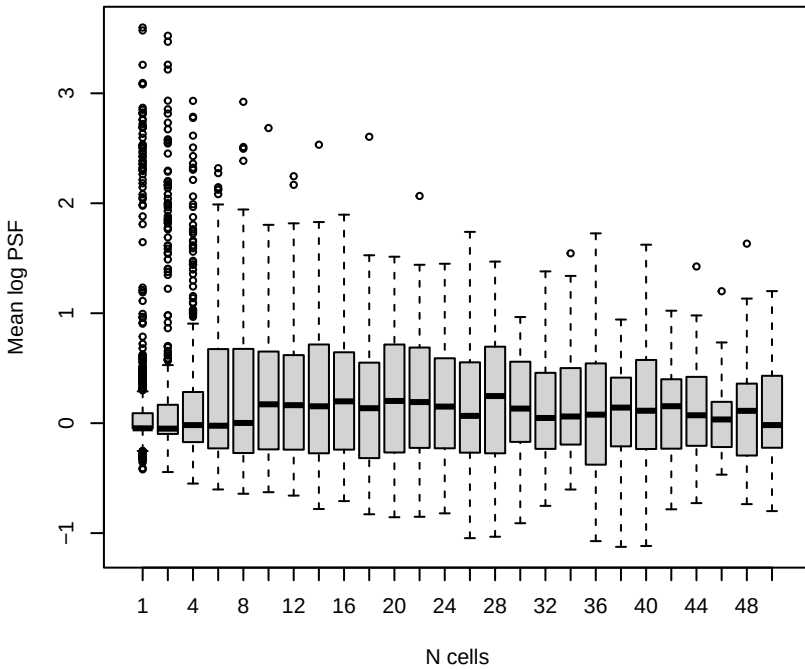
Chemokine signaling pathway_lung



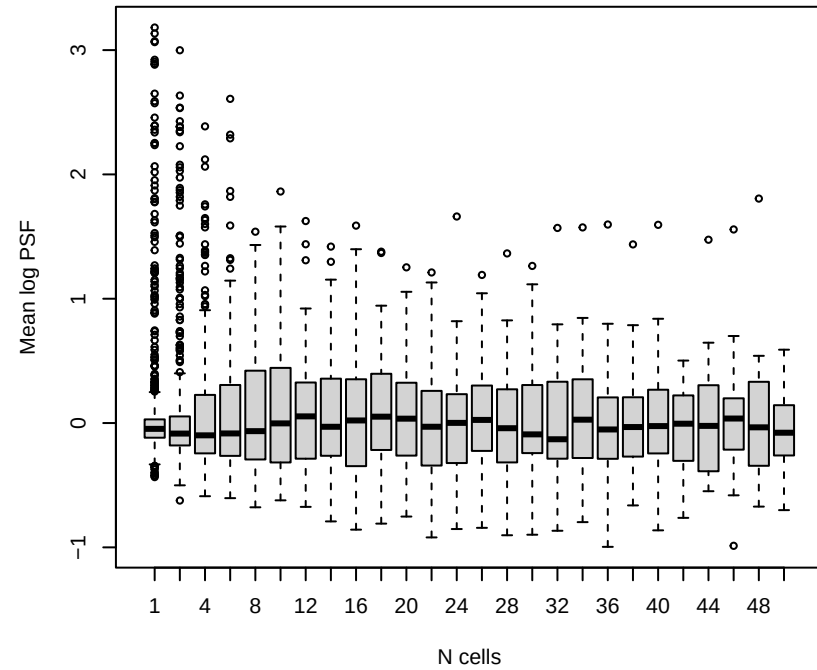
Chemokine signaling pathway_skin



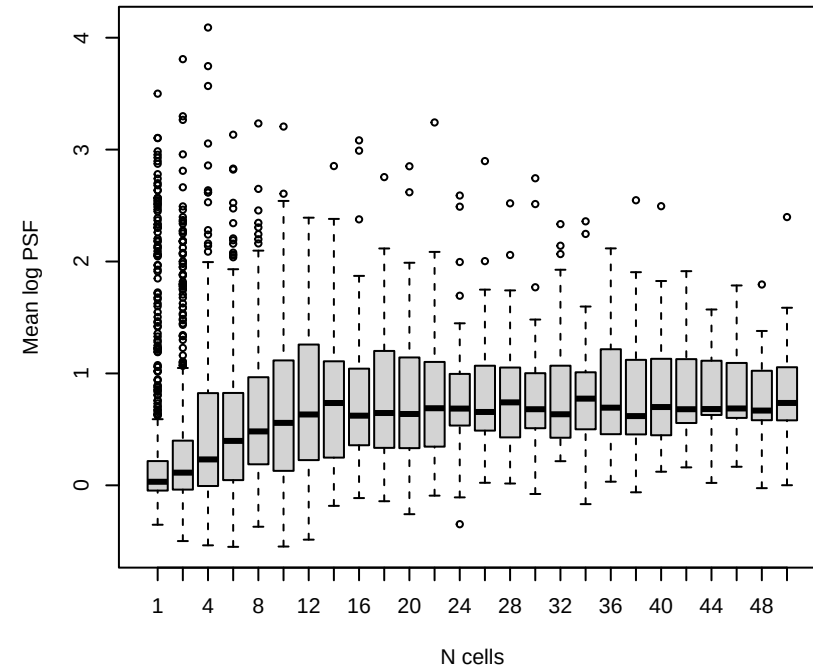
Complement and coagulation cascades_skeletalmuscle



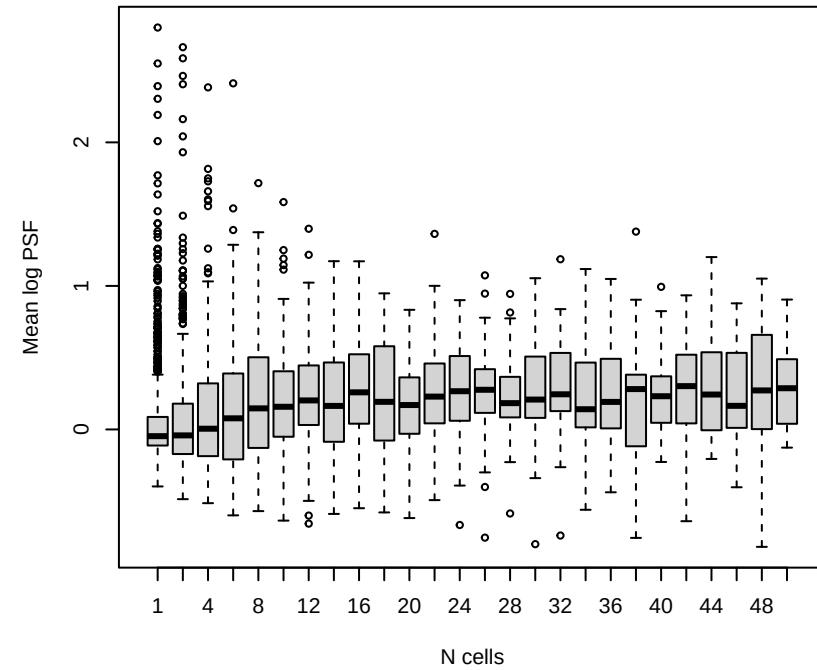
Complement and coagulation cascades_esophagusmucosa



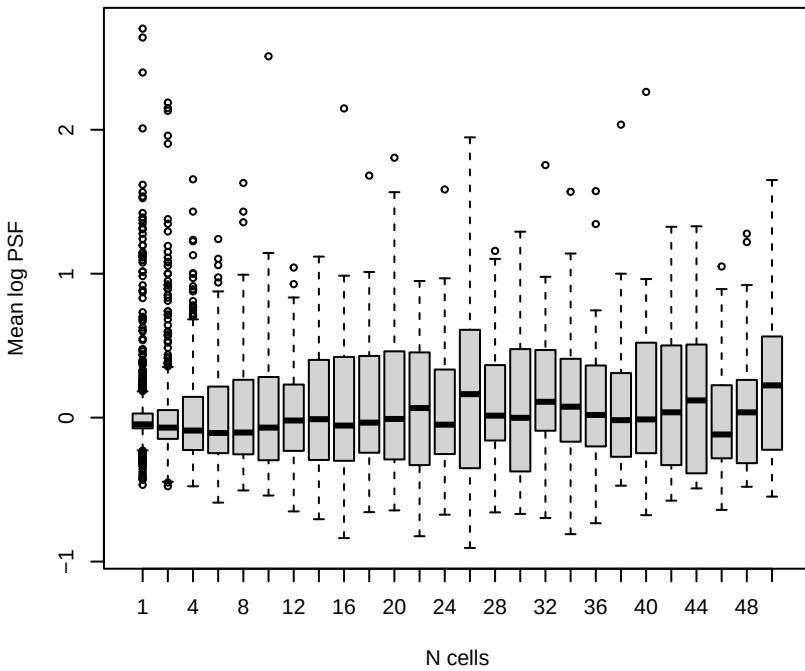
Complement and coagulation cascades_heart



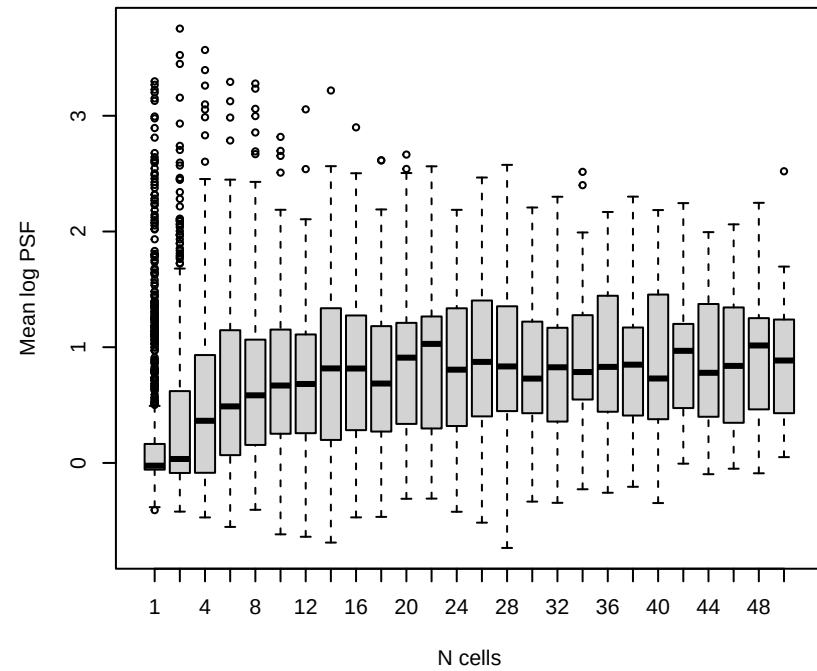
Complement and coagulation cascades_prostate



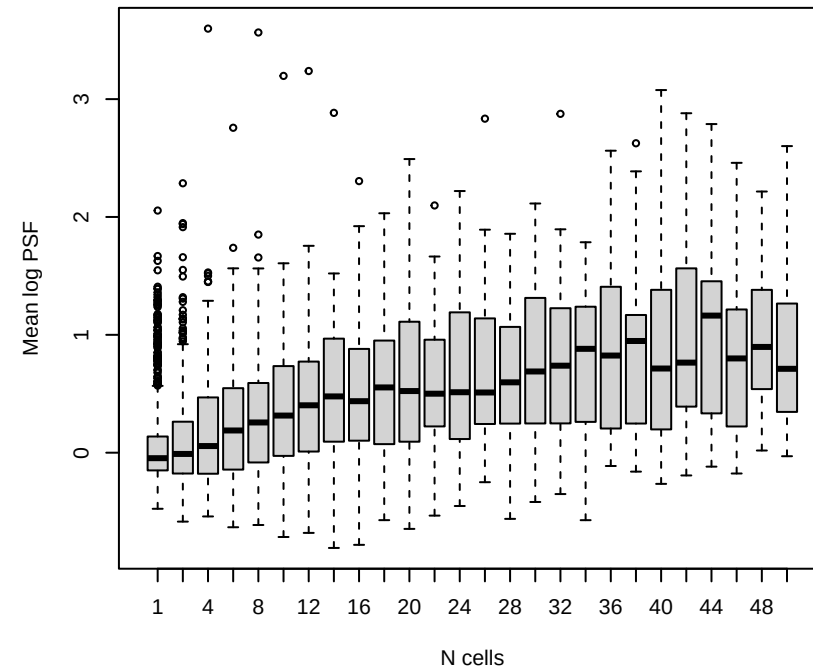
Complement and coagulation cascades_breast



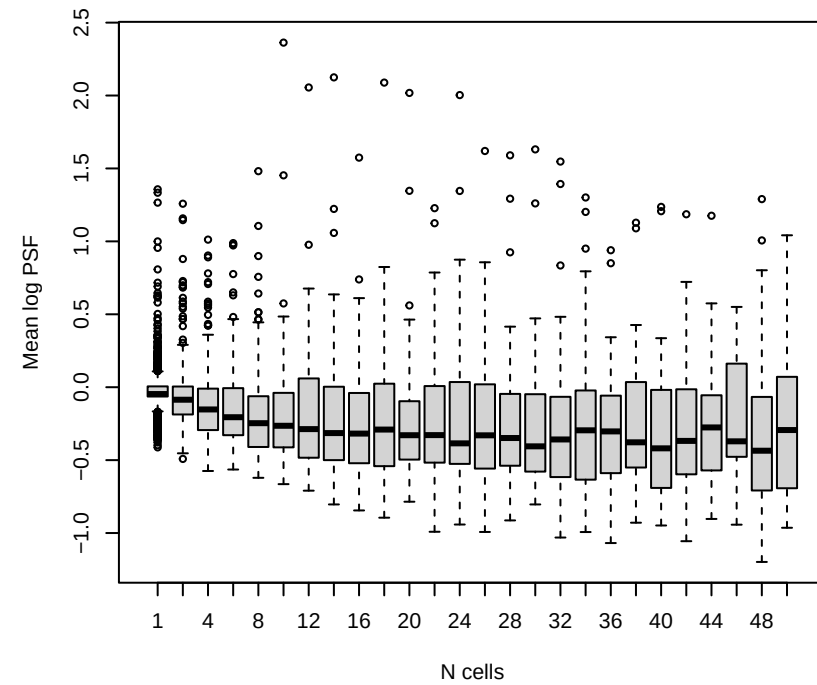
Complement and coagulation cascades_esophagusmuscularis

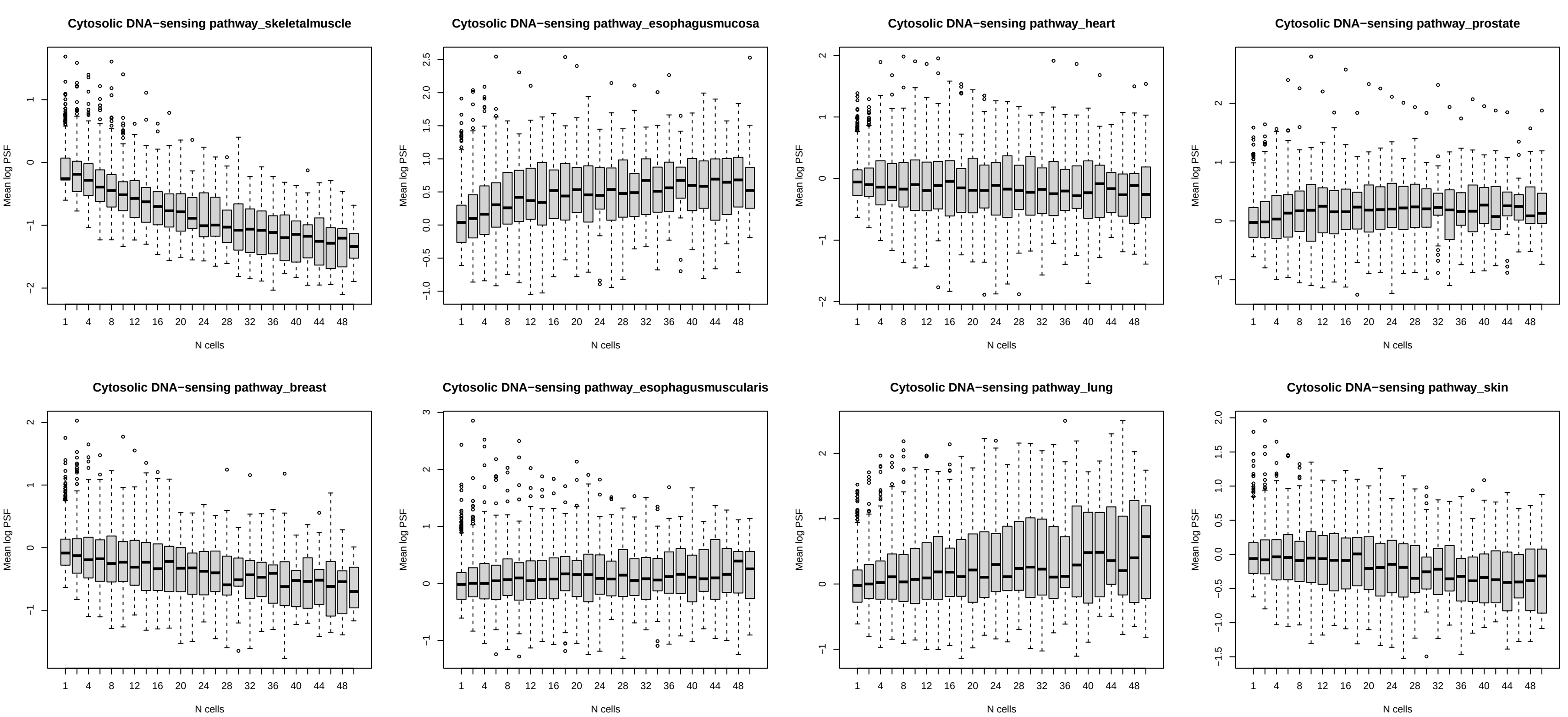


Complement and coagulation cascades_lung

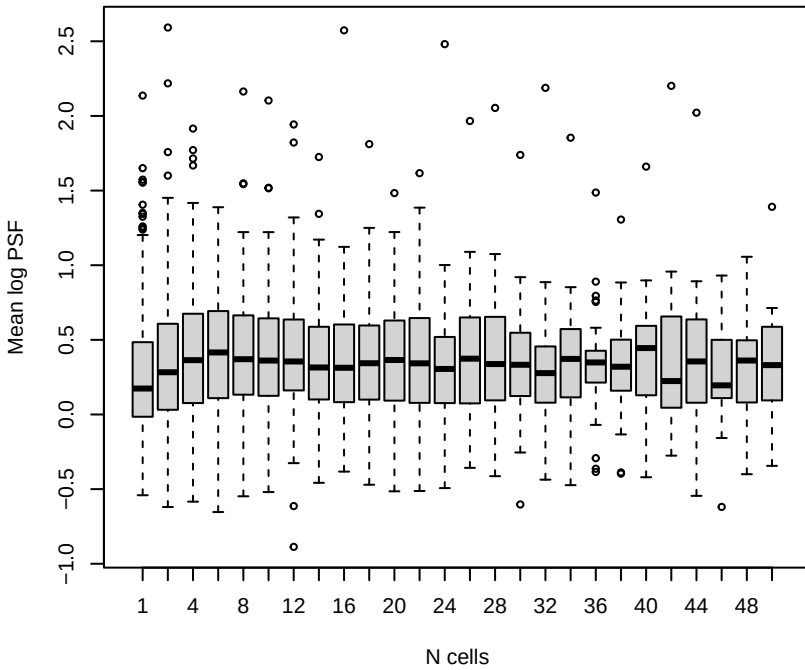


Complement and coagulation cascades_skin

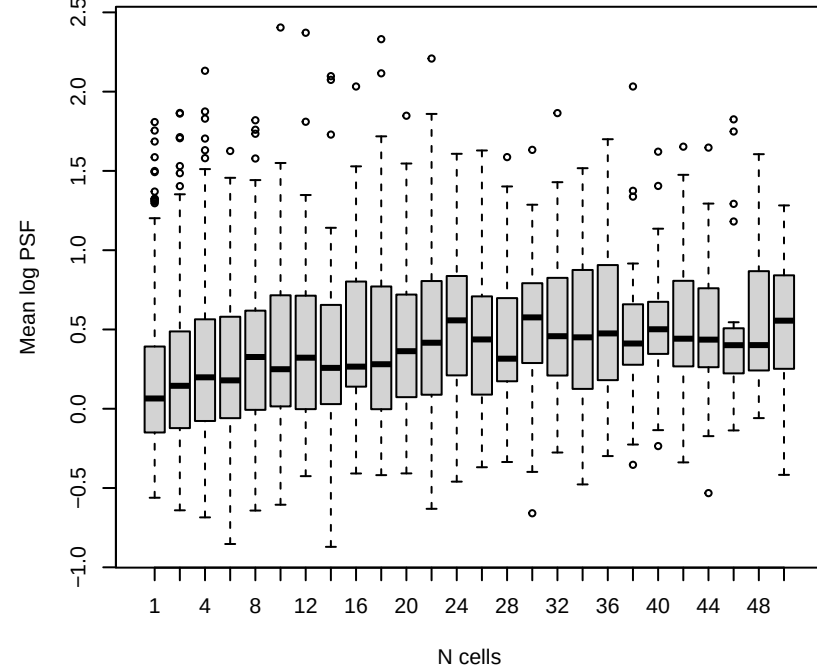




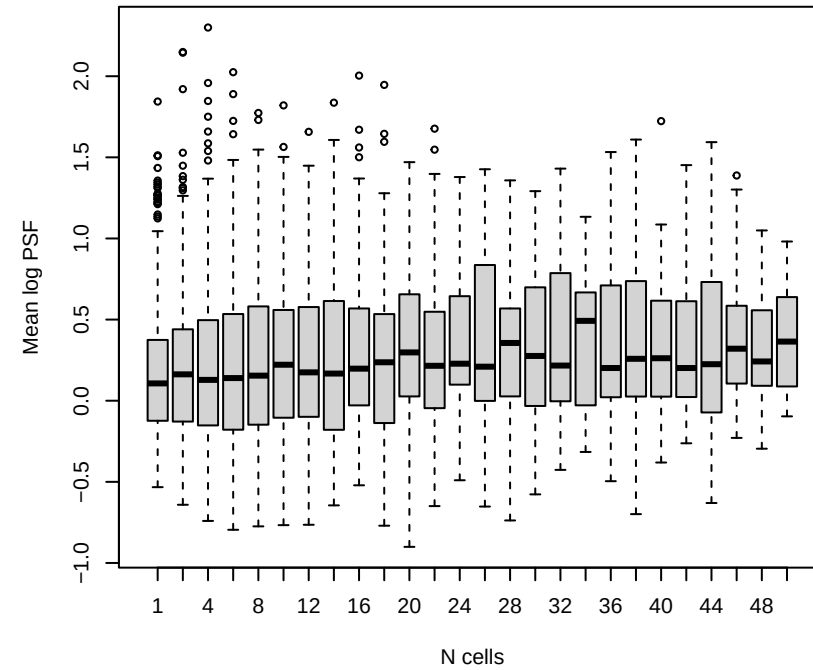
EGFR tyrosine kinase inhibitor resistance_skeletalmuscle



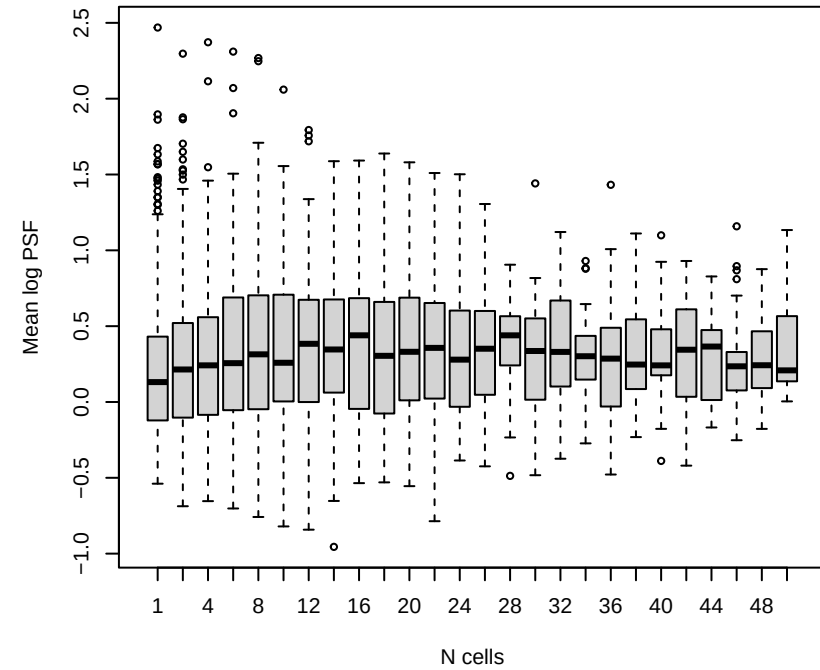
EGFR tyrosine kinase inhibitor resistance_esophagusmucosa



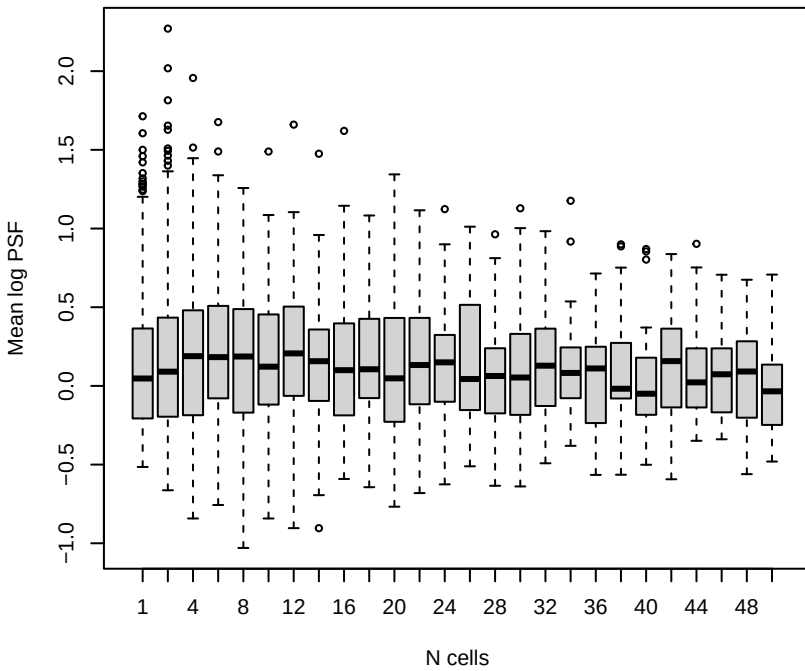
EGFR tyrosine kinase inhibitor resistance_heart



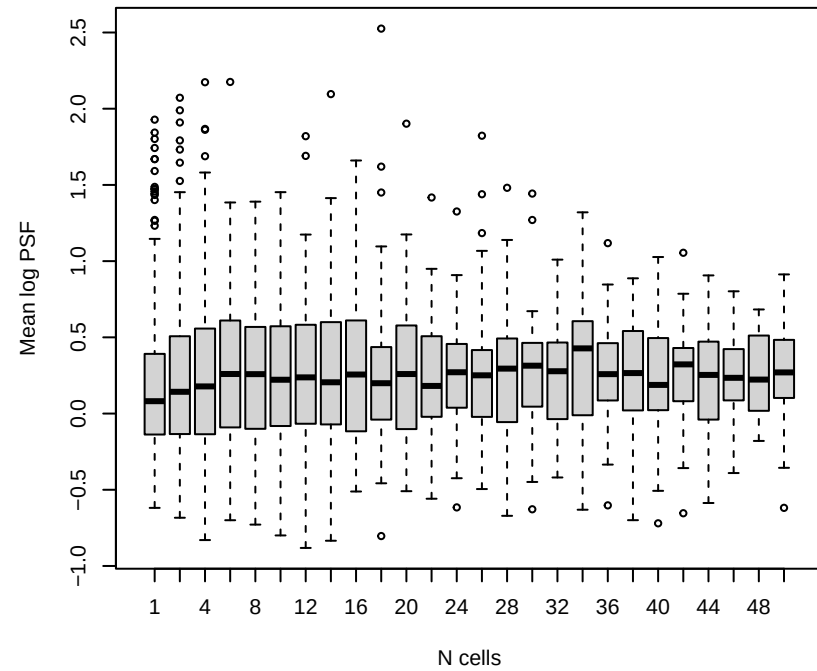
EGFR tyrosine kinase inhibitor resistance_prostate



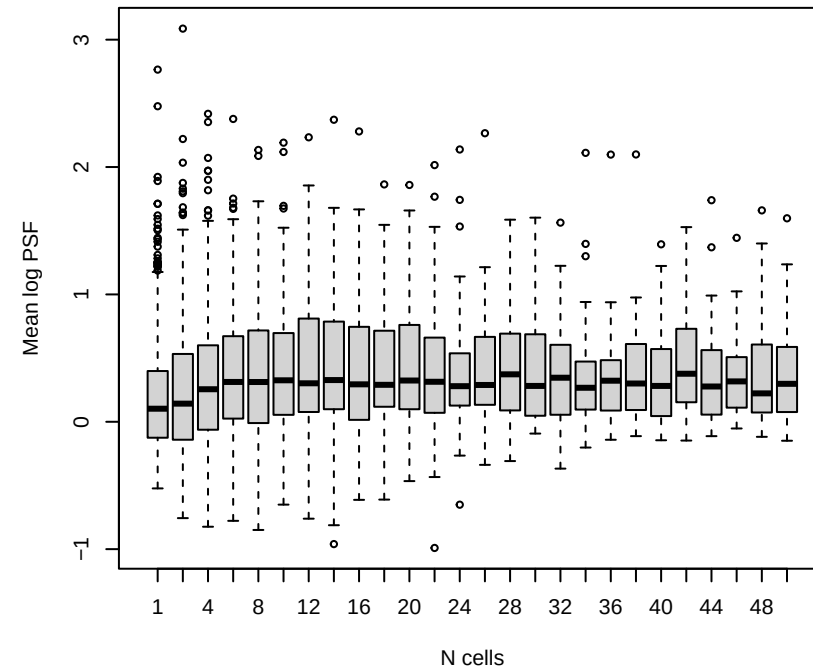
EGFR tyrosine kinase inhibitor resistance_breast



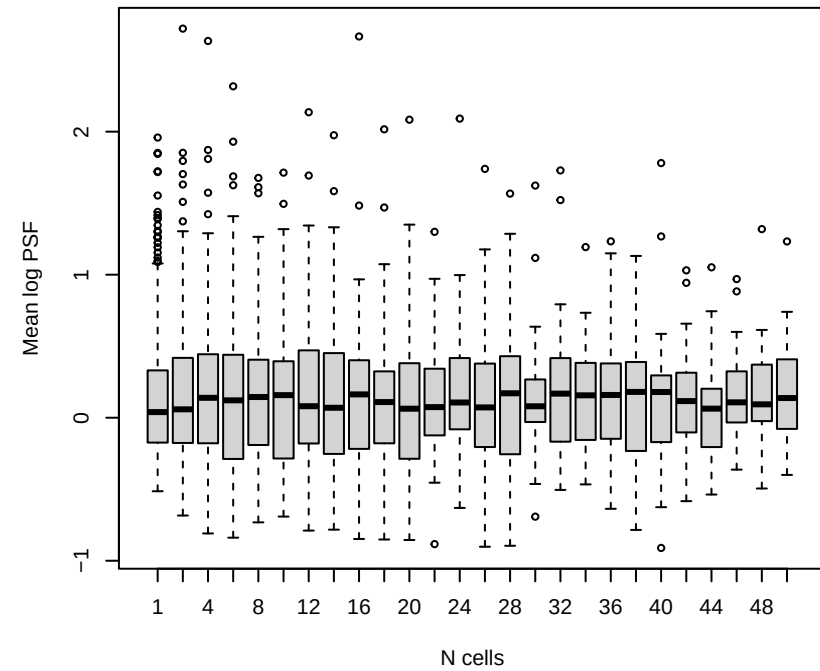
EGFR tyrosine kinase inhibitor resistance_esophagusmuscularis



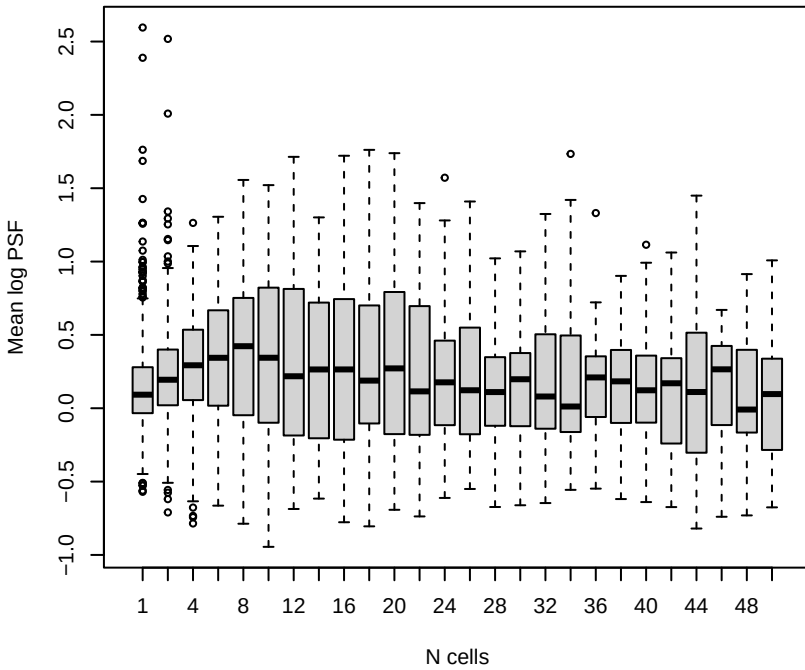
EGFR tyrosine kinase inhibitor resistance_lung



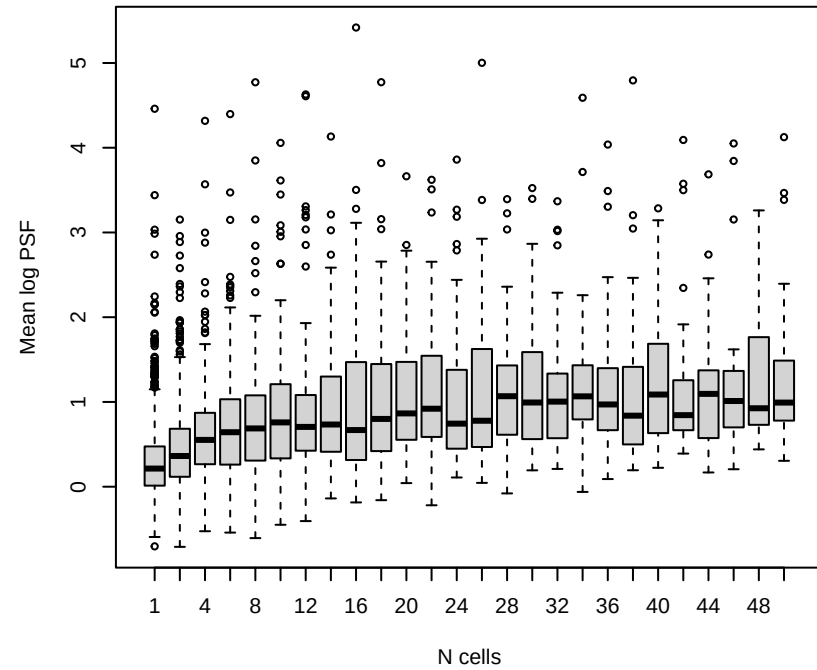
EGFR tyrosine kinase inhibitor resistance_skin



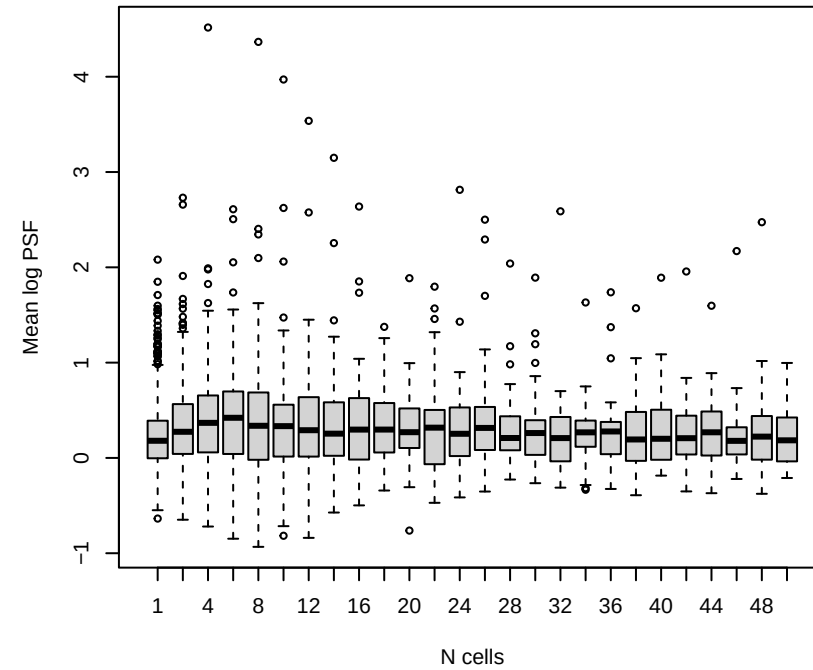
Endocrine resistance_skeletalmuscle



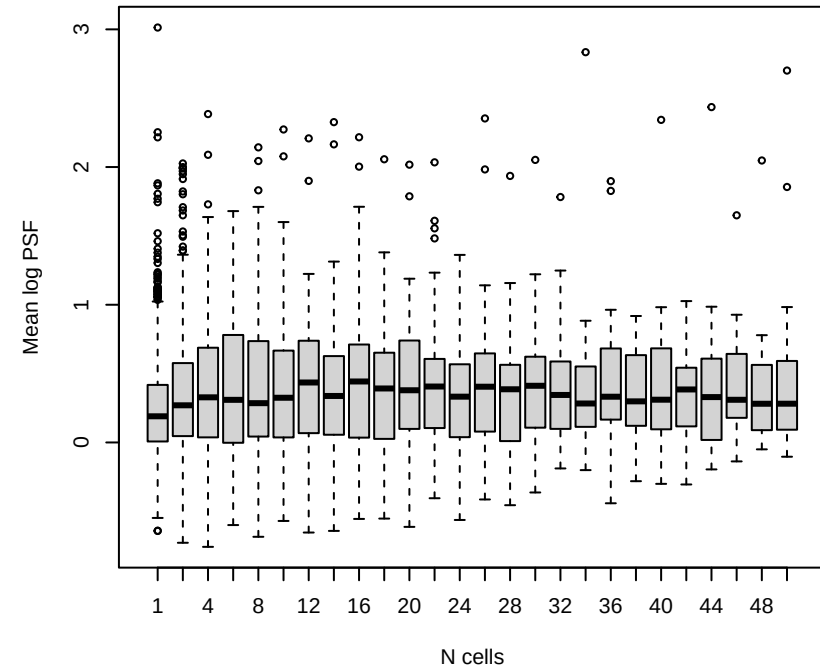
Endocrine resistance_esophagusmucosa



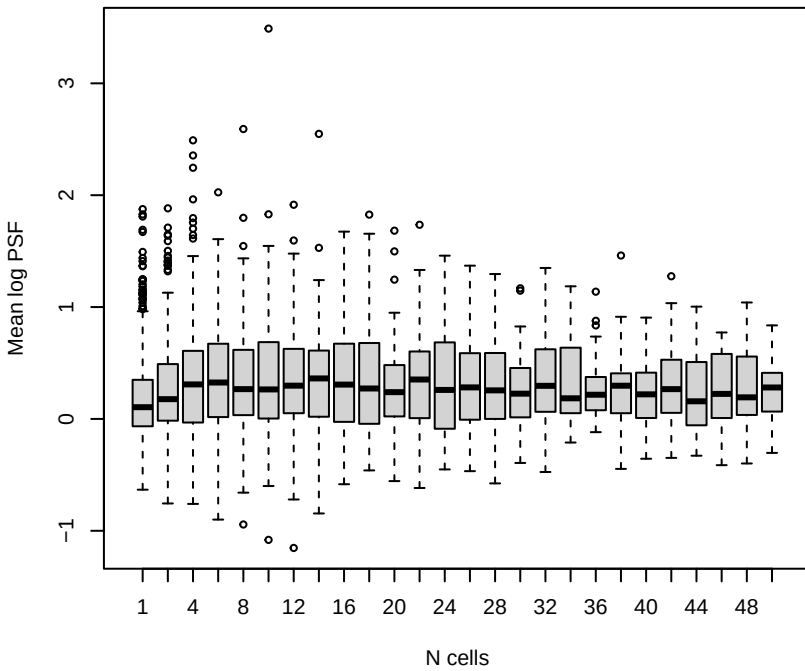
Endocrine resistance_heart



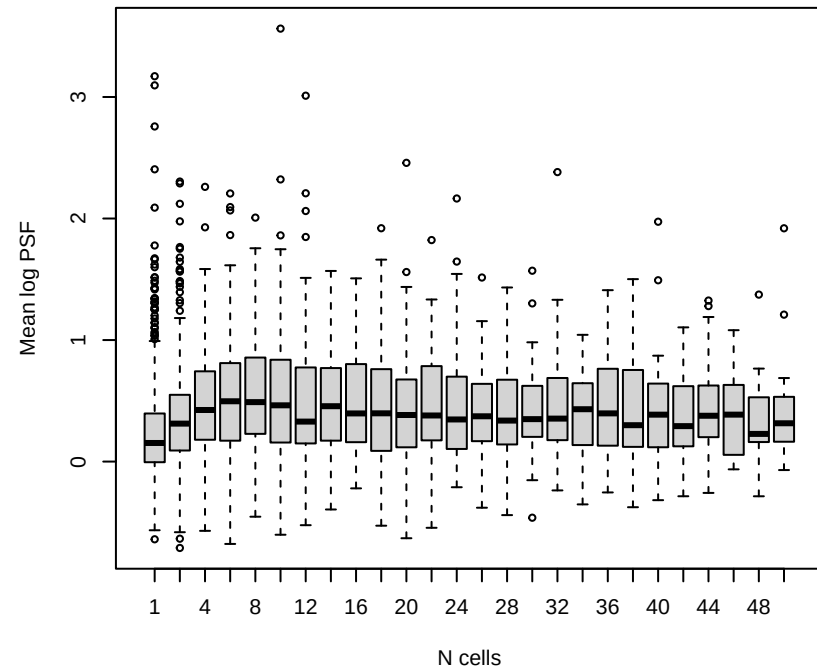
Endocrine resistance_prostate



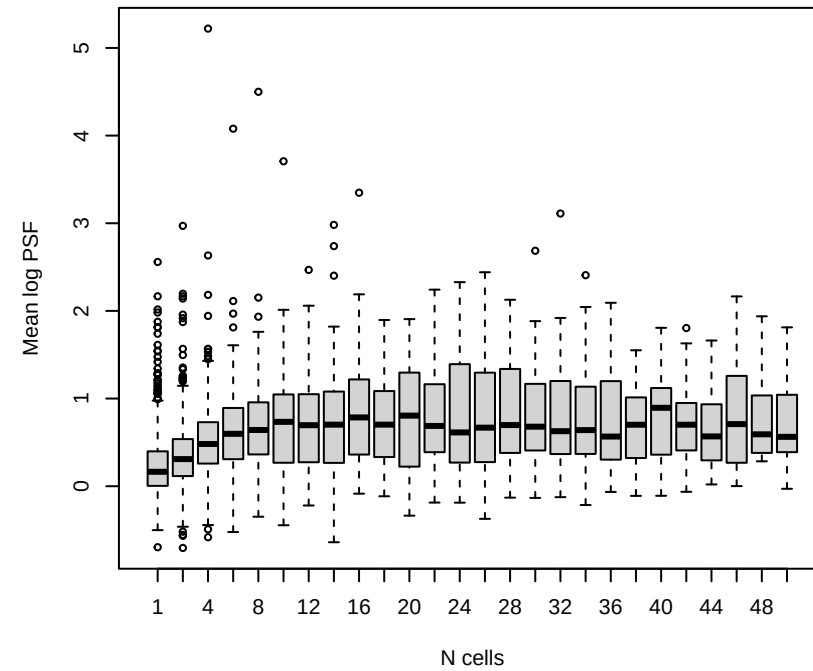
Endocrine resistance_breast



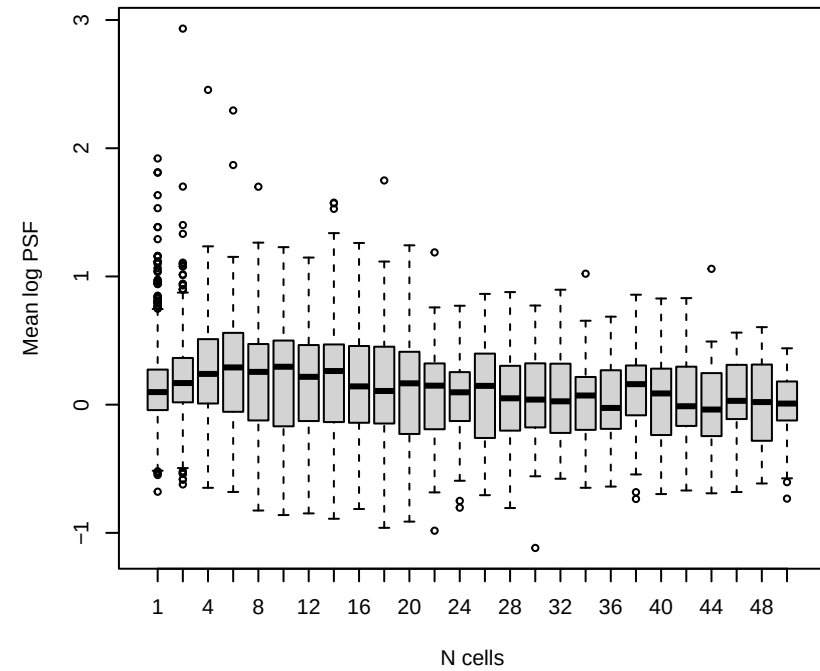
Endocrine resistance_esophagusmuscularis



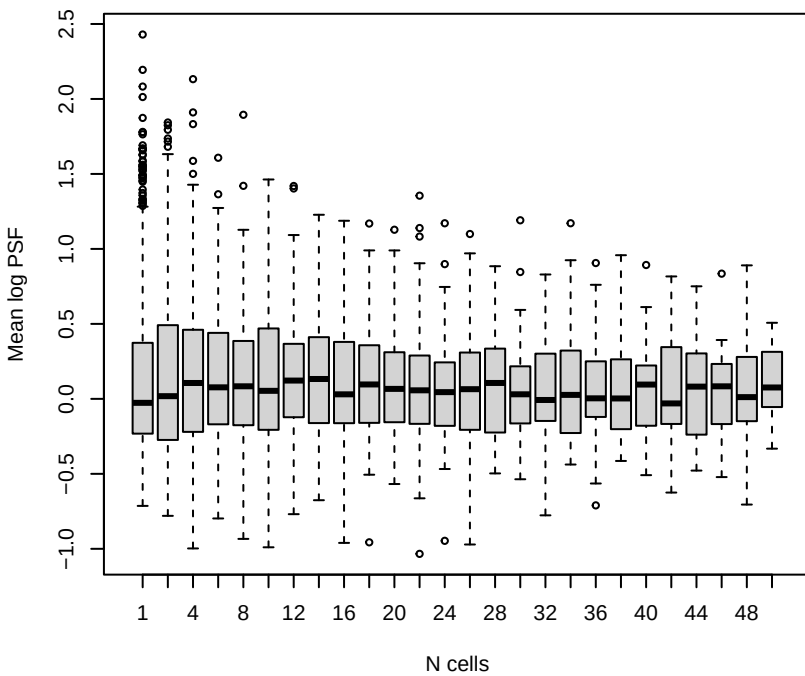
Endocrine resistance_lung



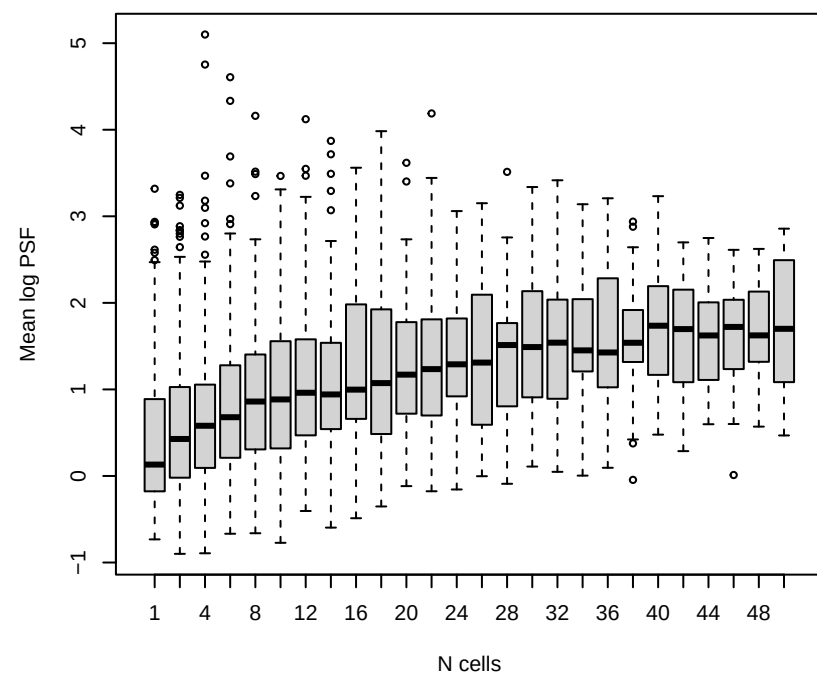
Endocrine resistance_skin



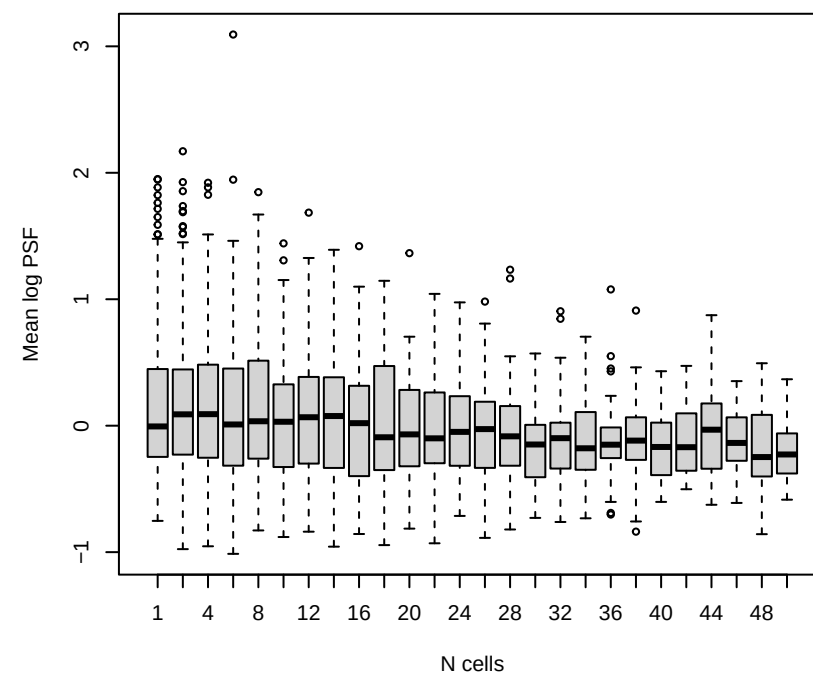
ErbB signaling pathway_skeletalmuscle



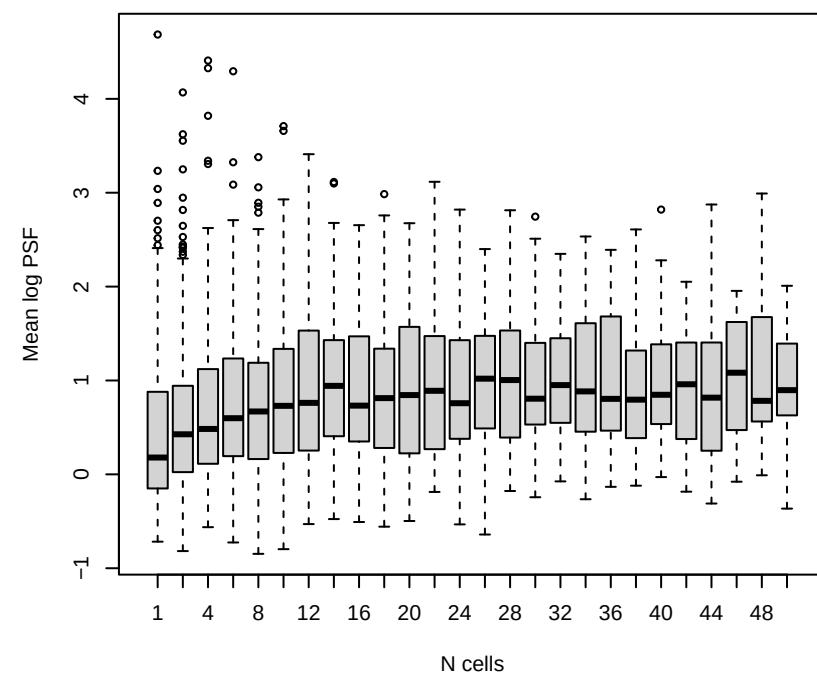
ErbB signaling pathway_esophagusmucosa



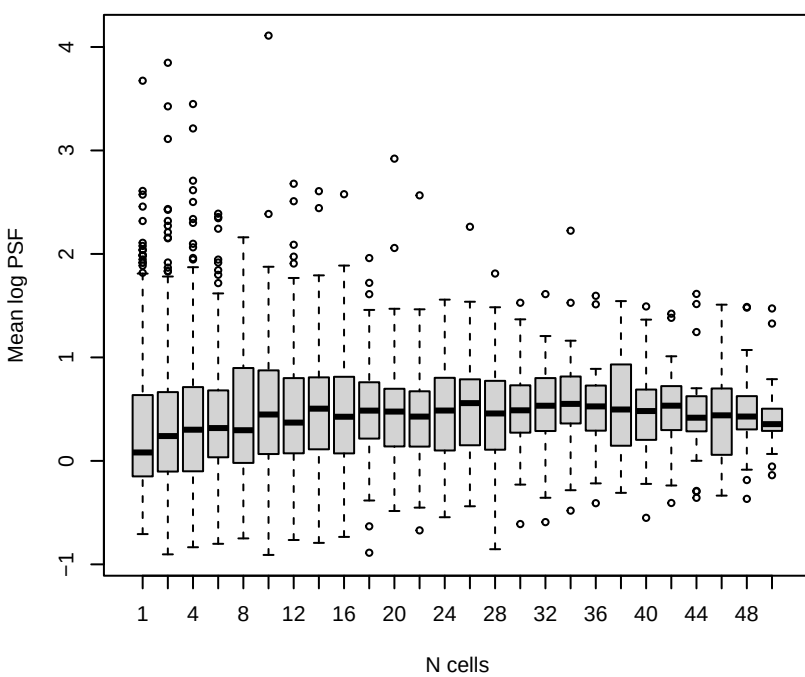
ErbB signaling pathway_heart



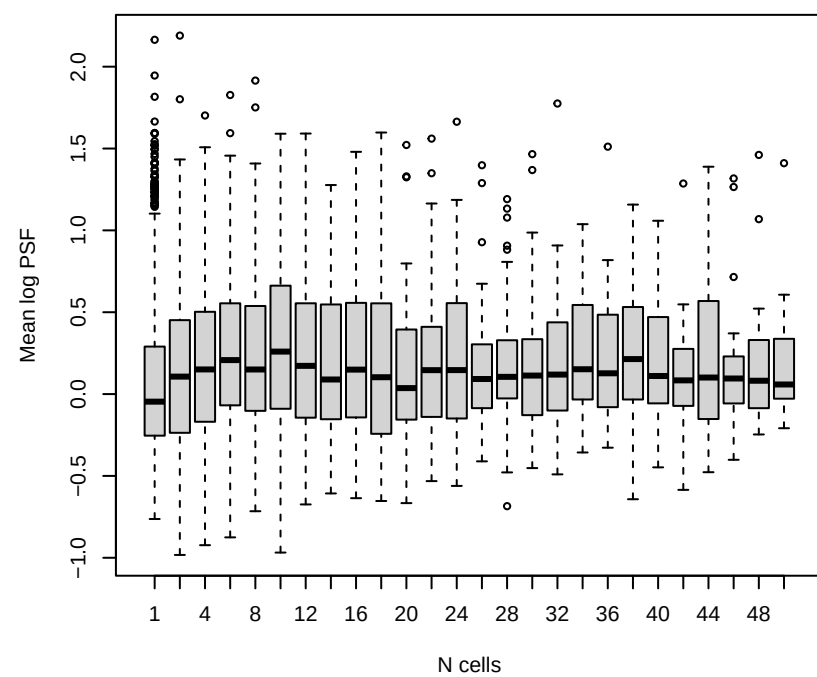
ErbB signaling pathway_prostate



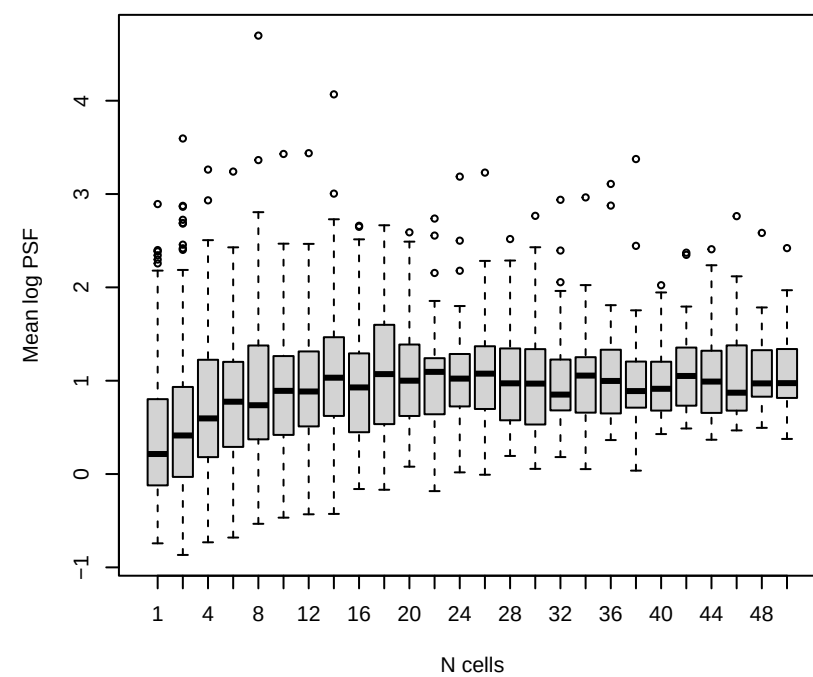
ErbB signaling pathway_breast



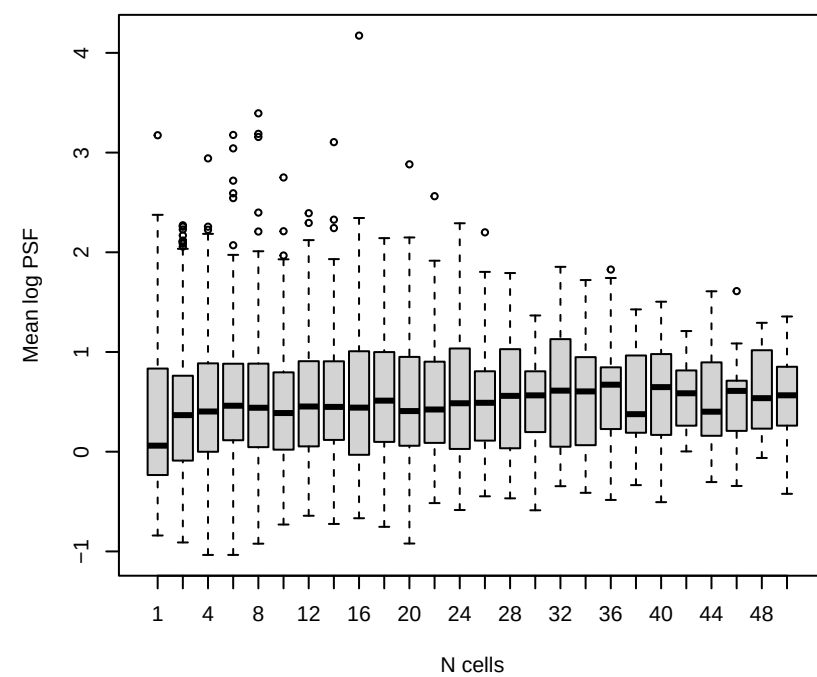
ErbB signaling pathway_esophagusmuscularis



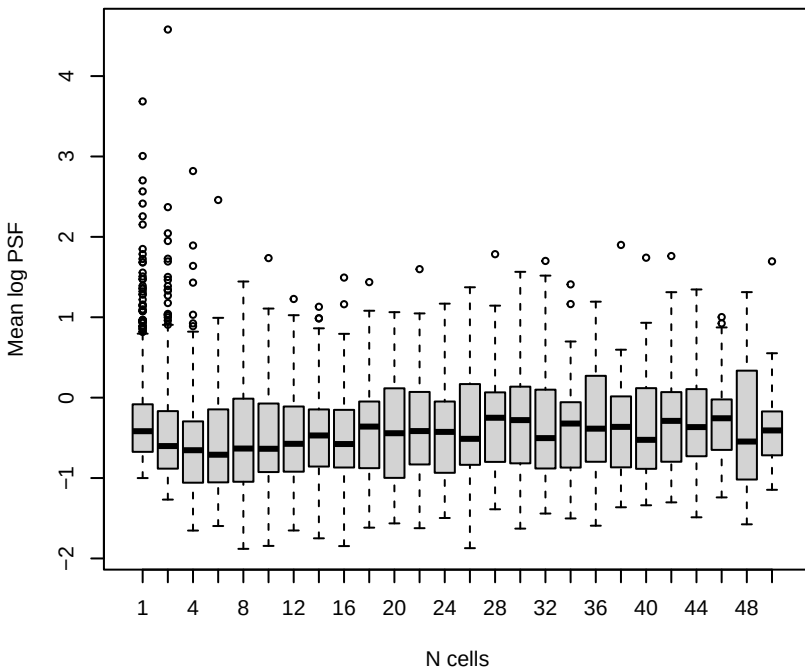
ErbB signaling pathway_lung



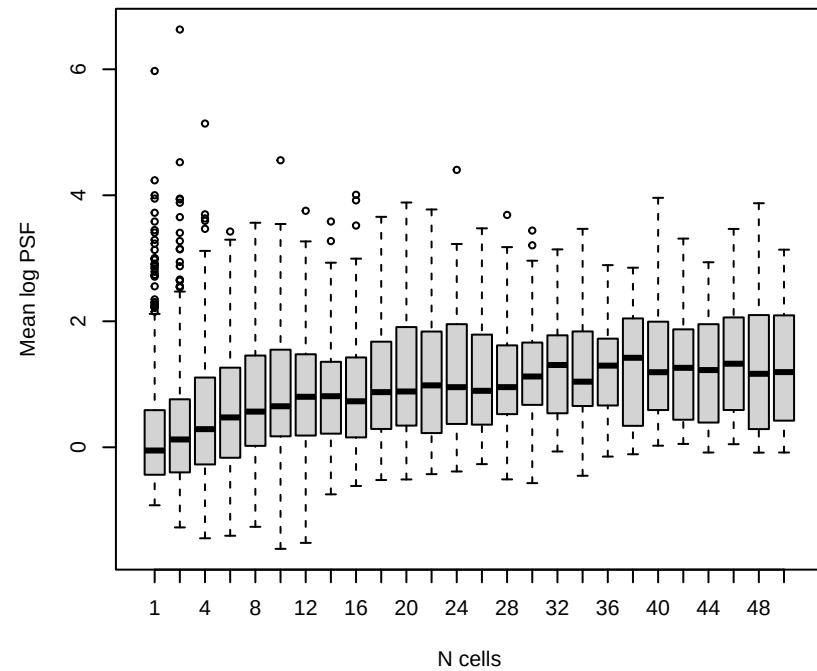
ErbB signaling pathway_skin



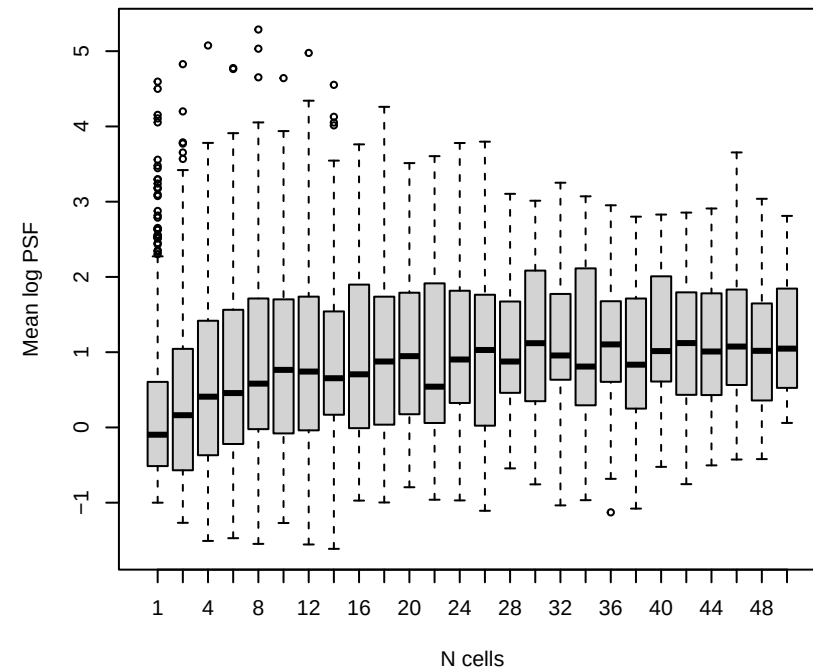
Fc epsilon RI signaling pathway_skeletalmuscle



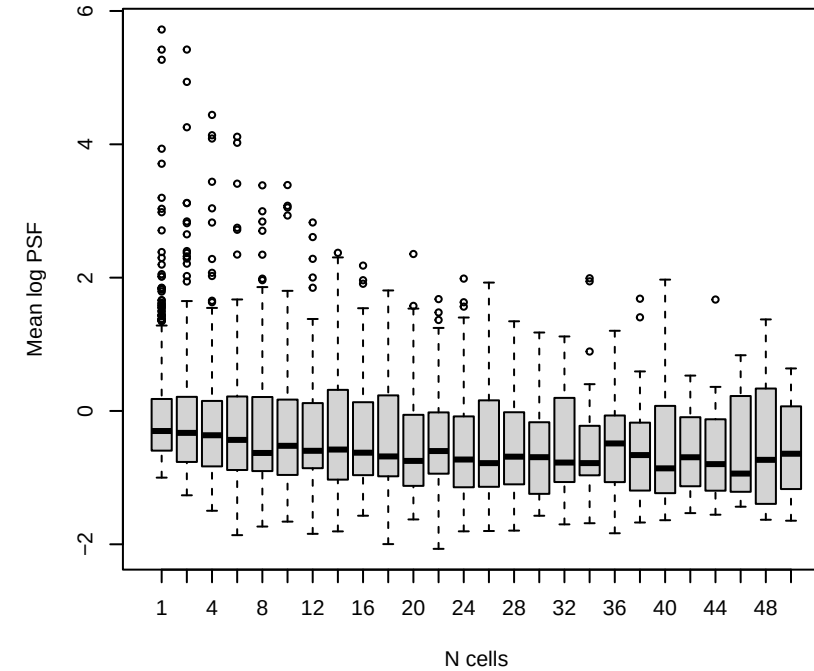
Fc epsilon RI signaling pathway_esophagusmucosa



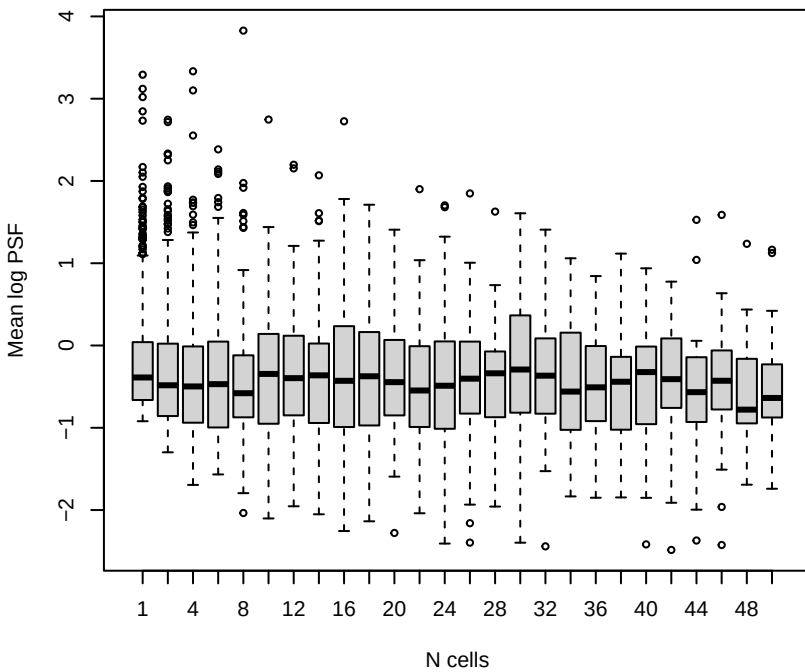
Fc epsilon RI signaling pathway_heart



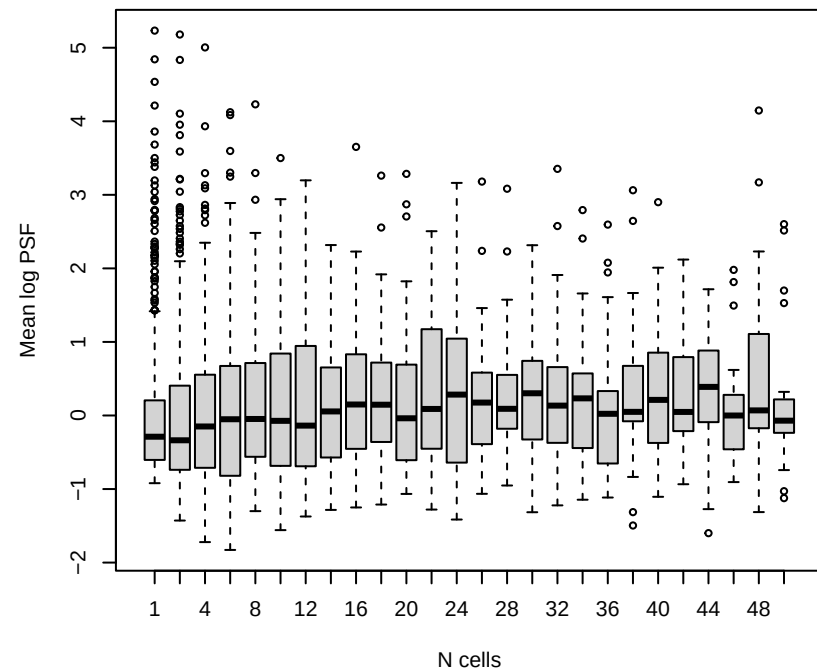
Fc epsilon RI signaling pathway_prostate



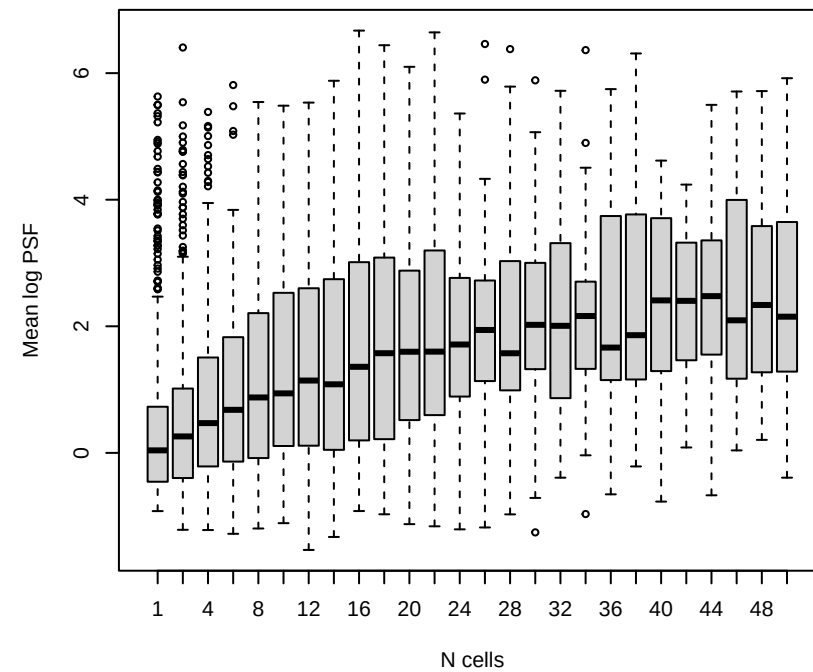
Fc epsilon RI signaling pathway_breast



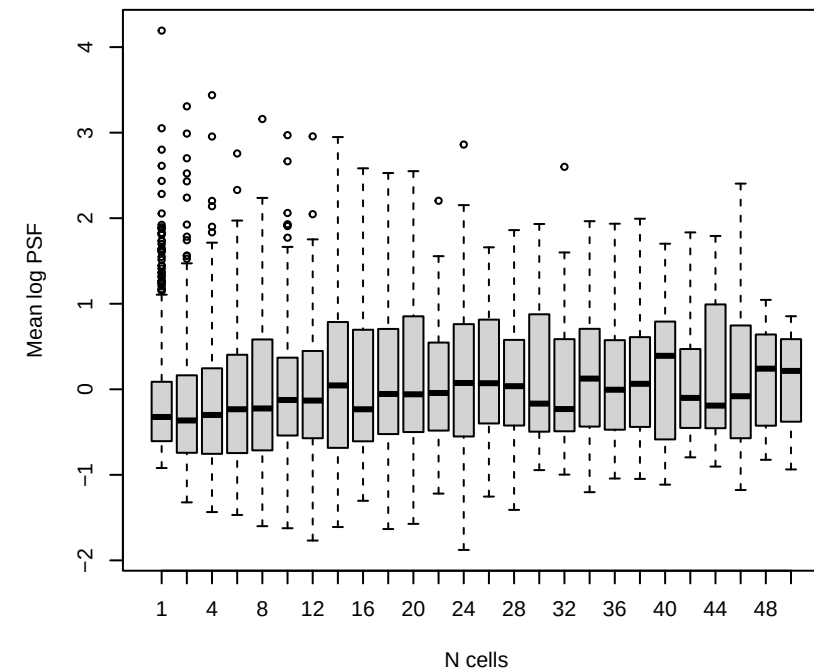
Fc epsilon RI signaling pathway_esophagusmuscularis



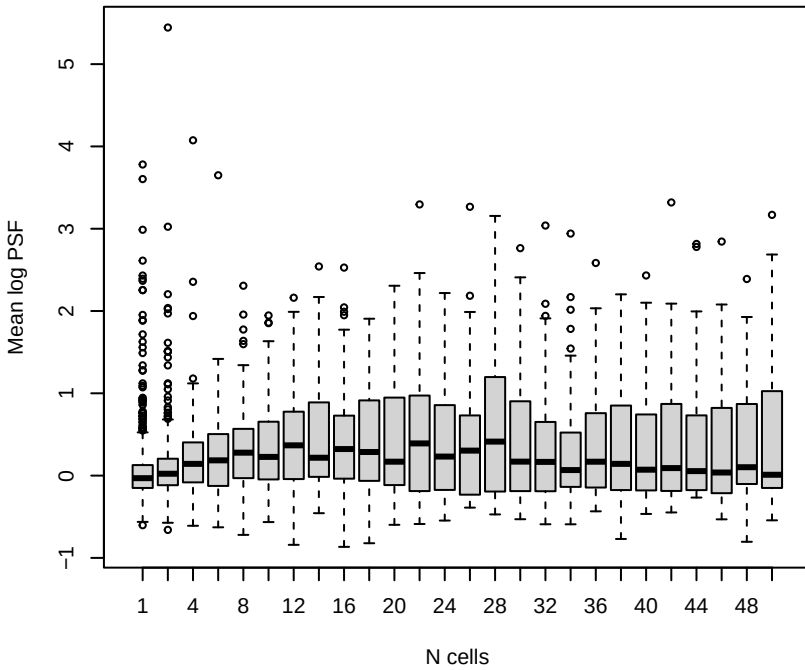
Fc epsilon RI signaling pathway_lung



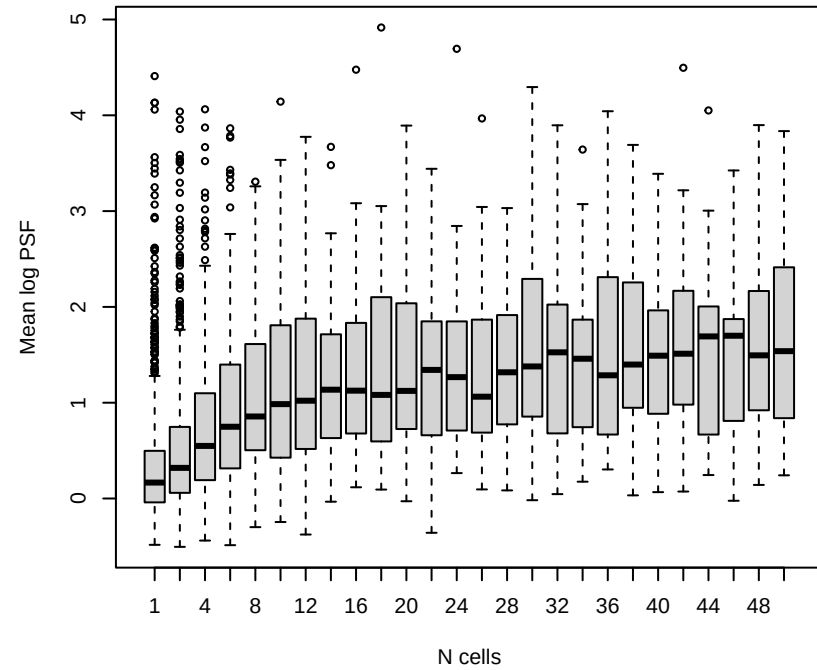
Fc epsilon RI signaling pathway_skin



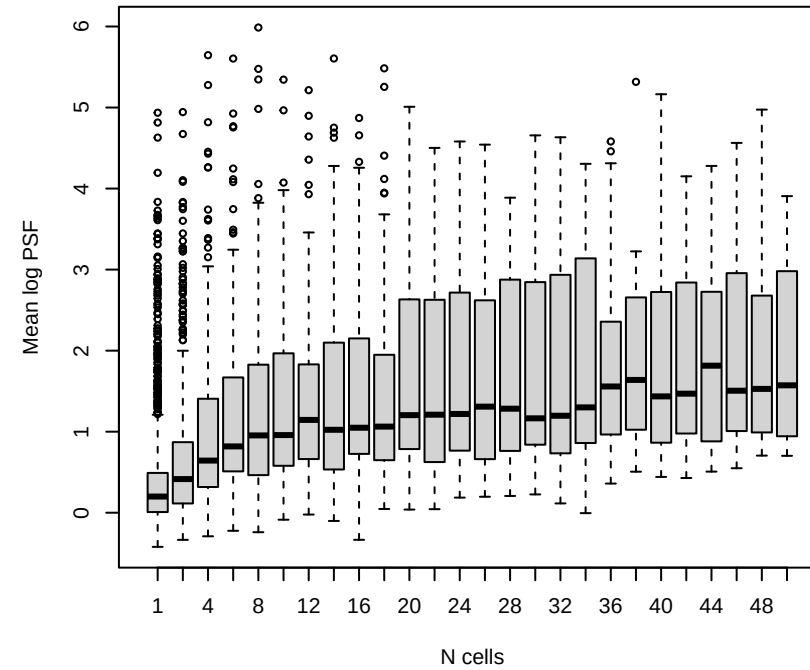
Fc gamma R-mediated phagocytosis_skeletalmuscle



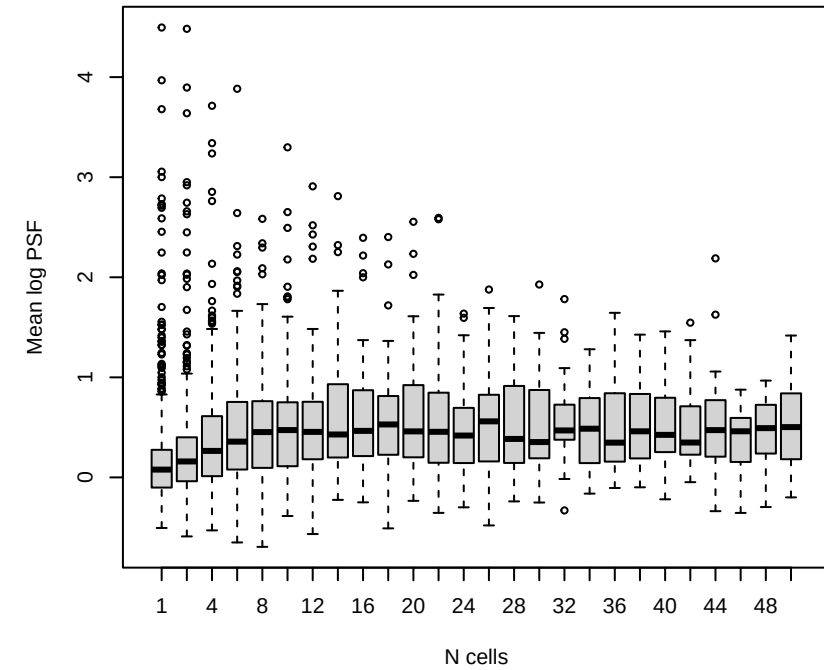
Fc gamma R-mediated phagocytosis_esophagusmucosa



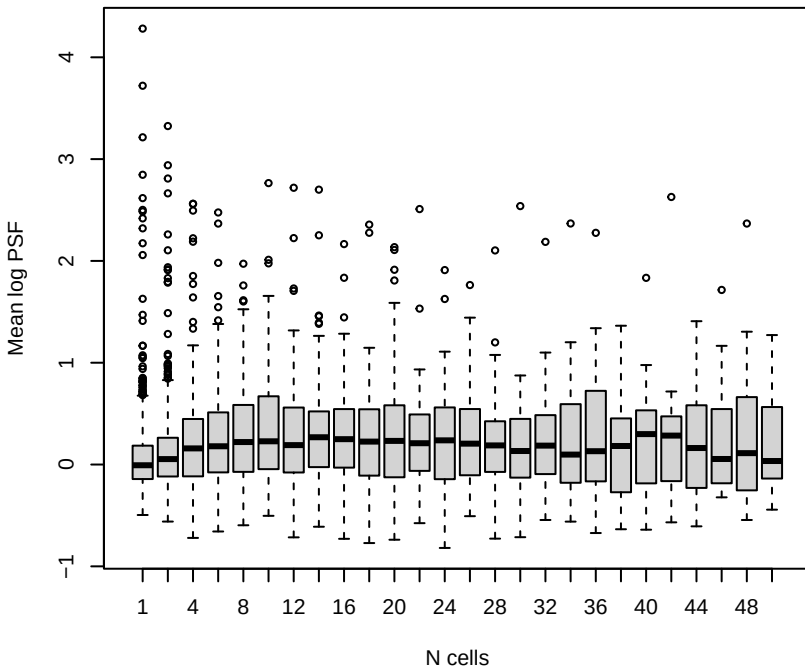
Fc gamma R-mediated phagocytosis_heart



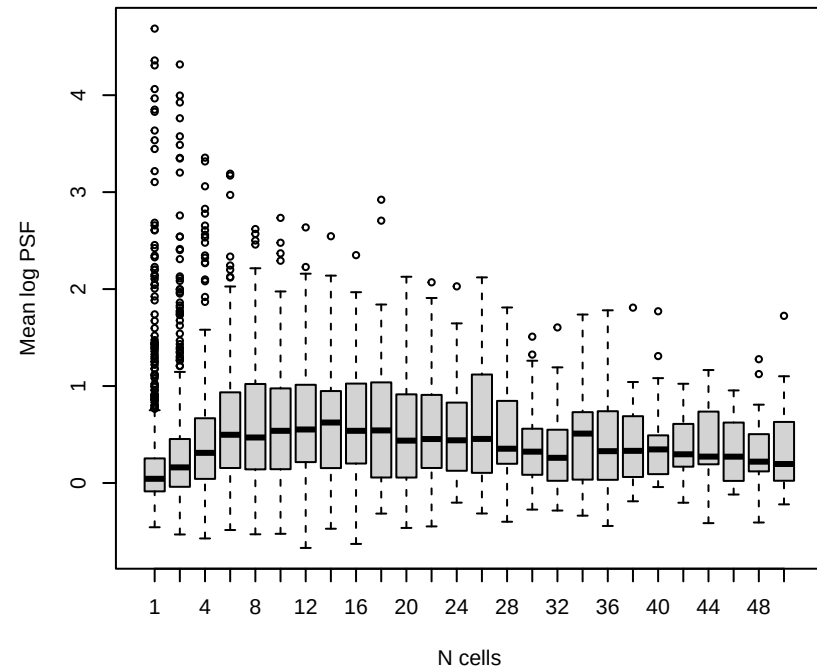
Fc gamma R-mediated phagocytosis_prostate



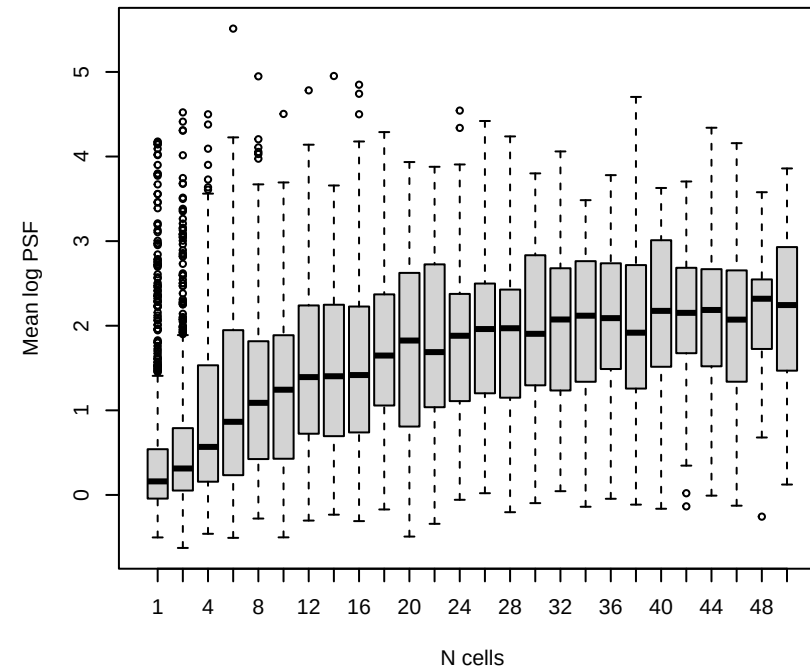
Fc gamma R-mediated phagocytosis_breast



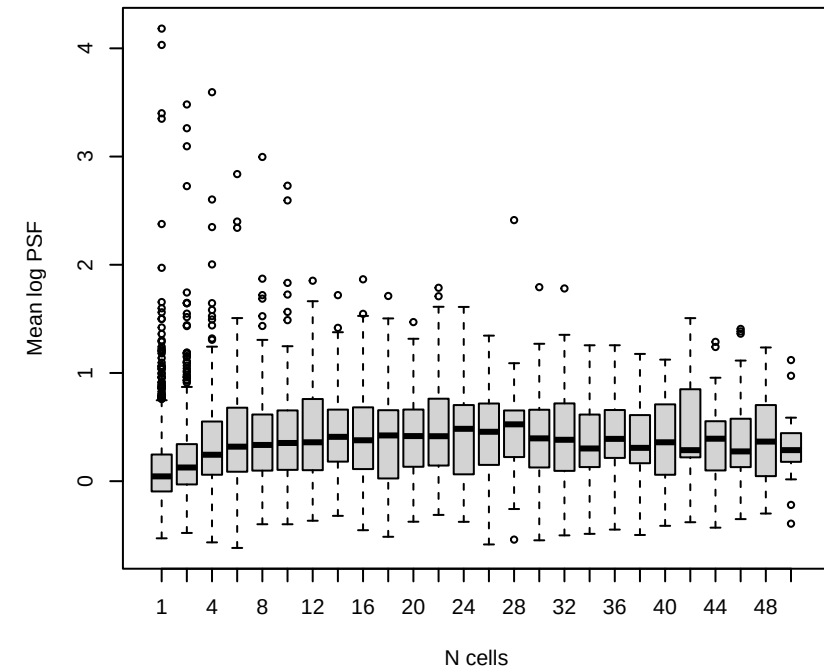
Fc gamma R-mediated phagocytosis_esophagusmuscularis



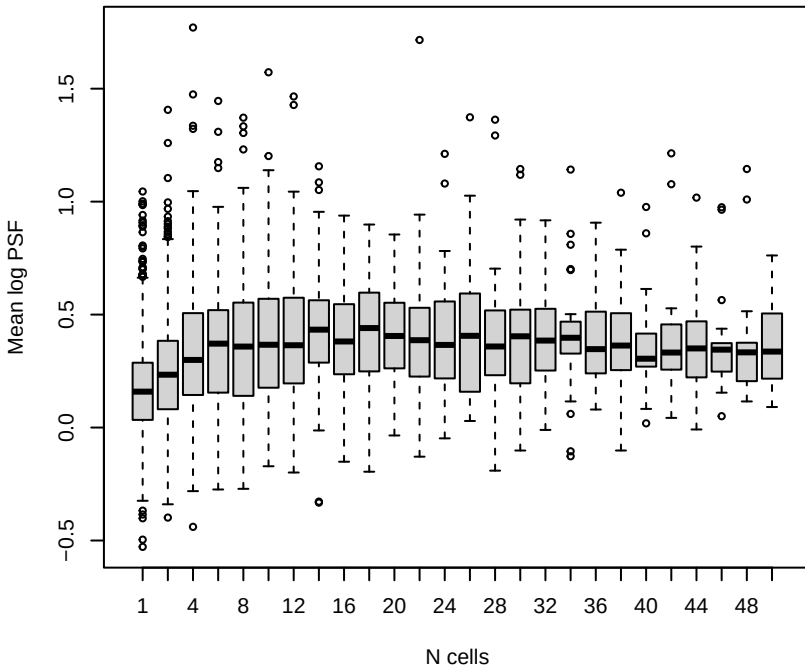
Fc gamma R-mediated phagocytosis_lung



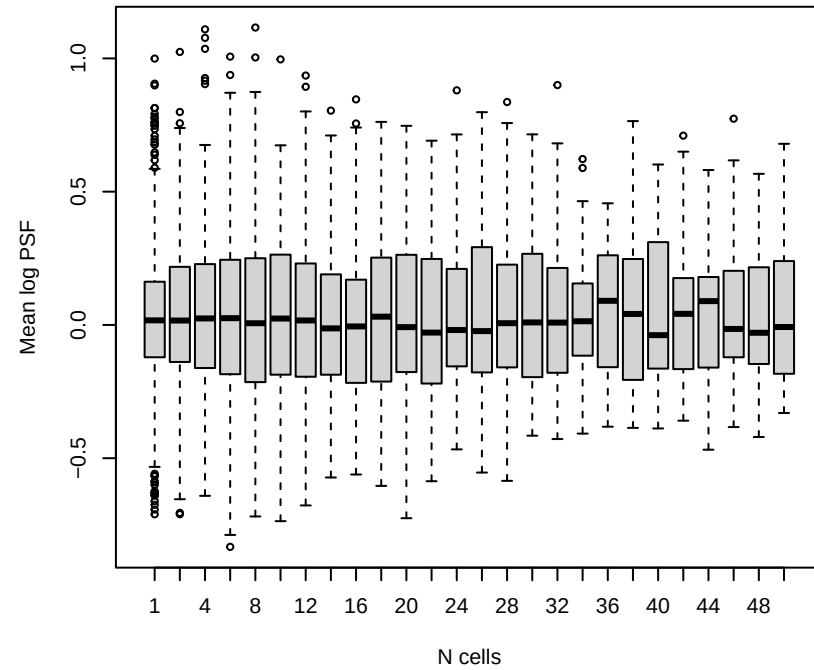
Fc gamma R-mediated phagocytosis_skin



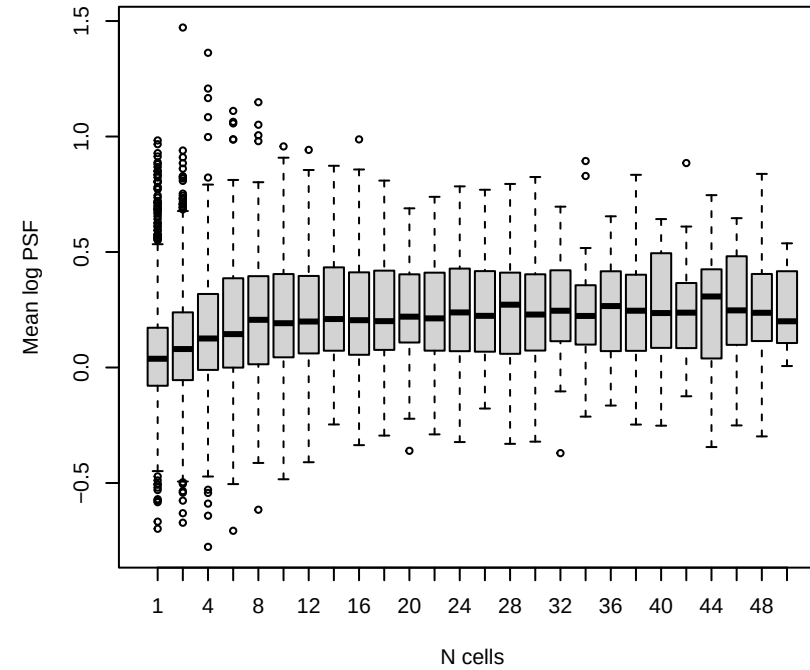
FoxO signaling pathway_skeletalmuscle



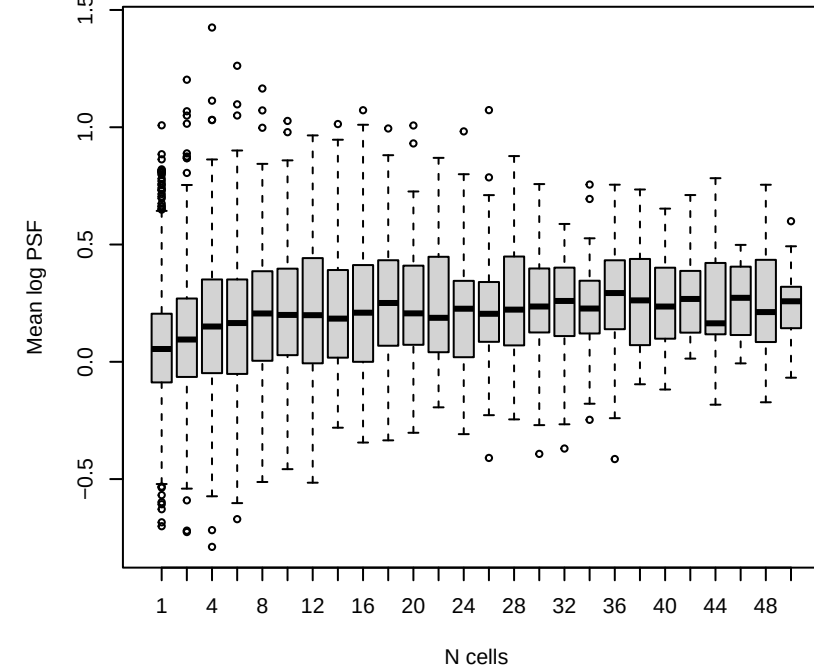
FoxO signaling pathway_esophagasmucosa



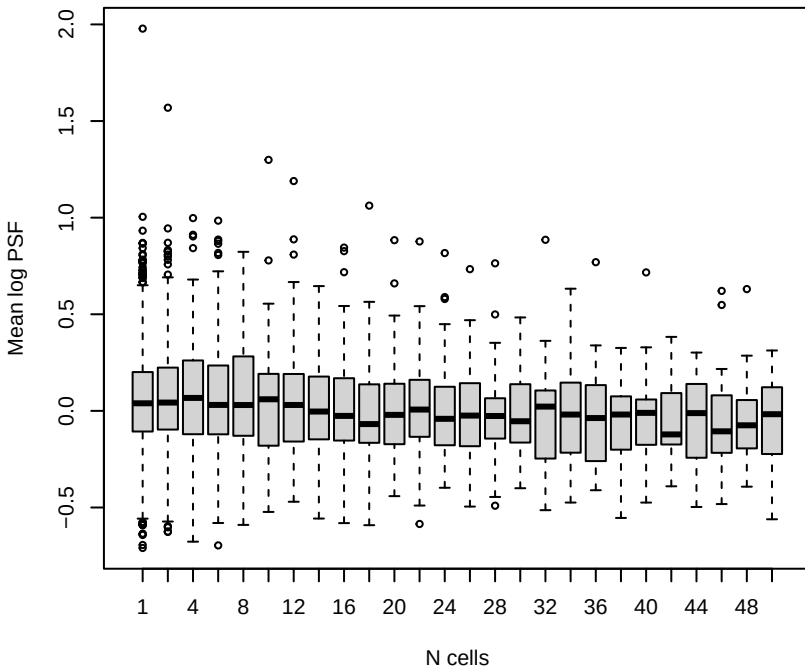
FoxO signaling pathway_heart



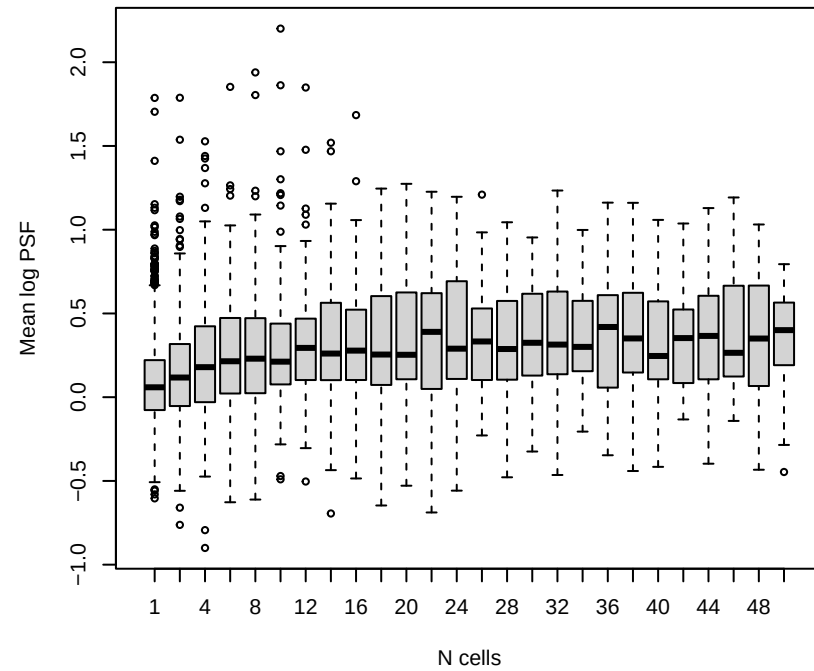
FoxO signaling pathway_prostate



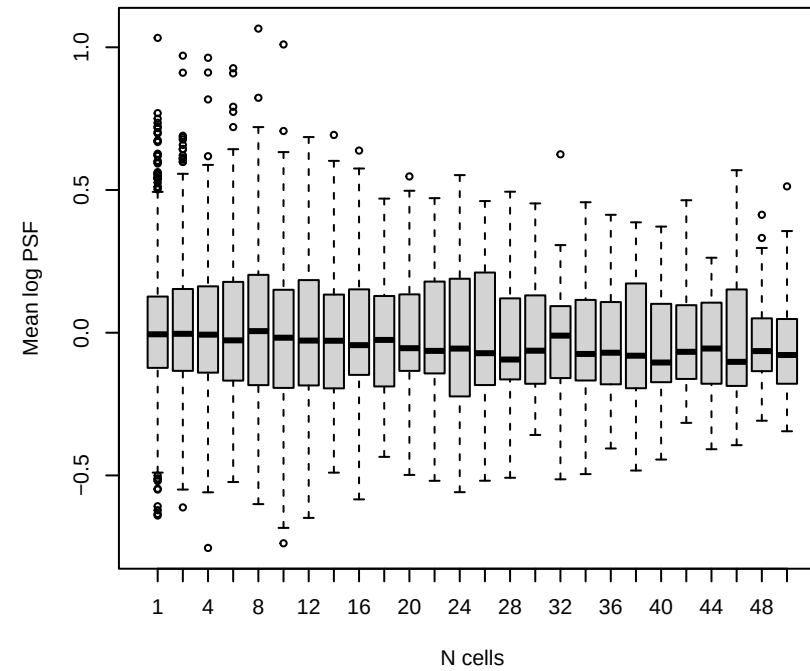
FoxO signaling pathway_breast



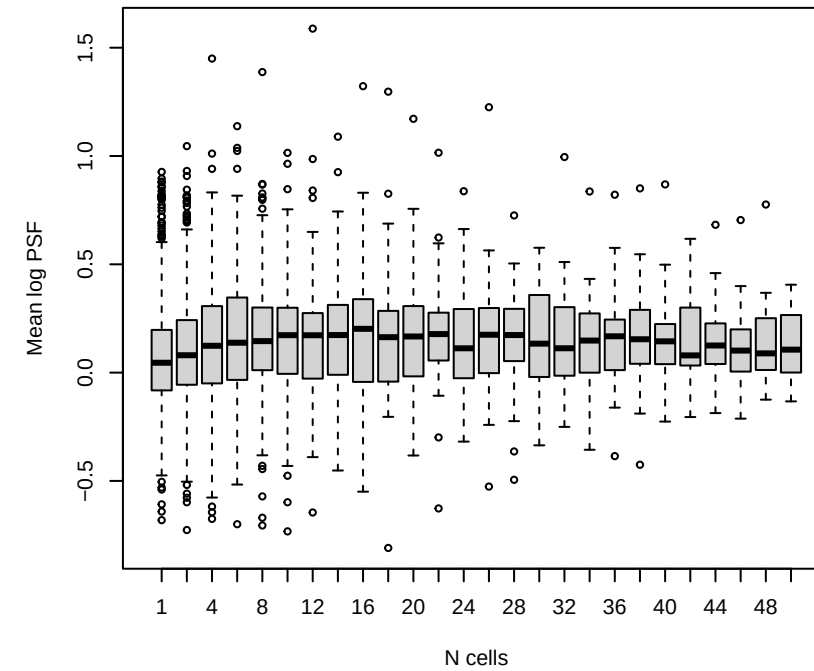
FoxO signaling pathway_esophagusmuscularis

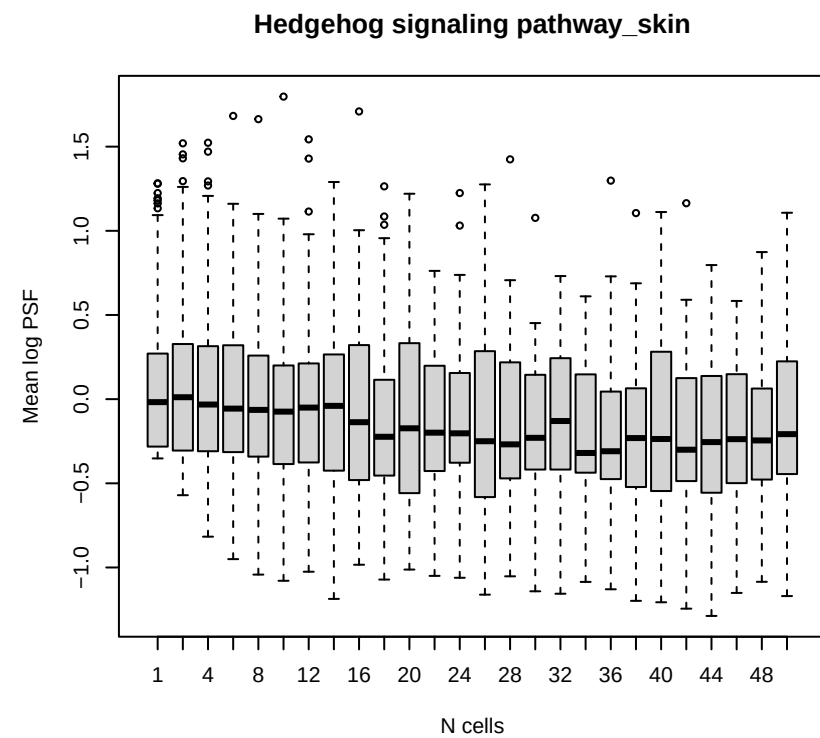
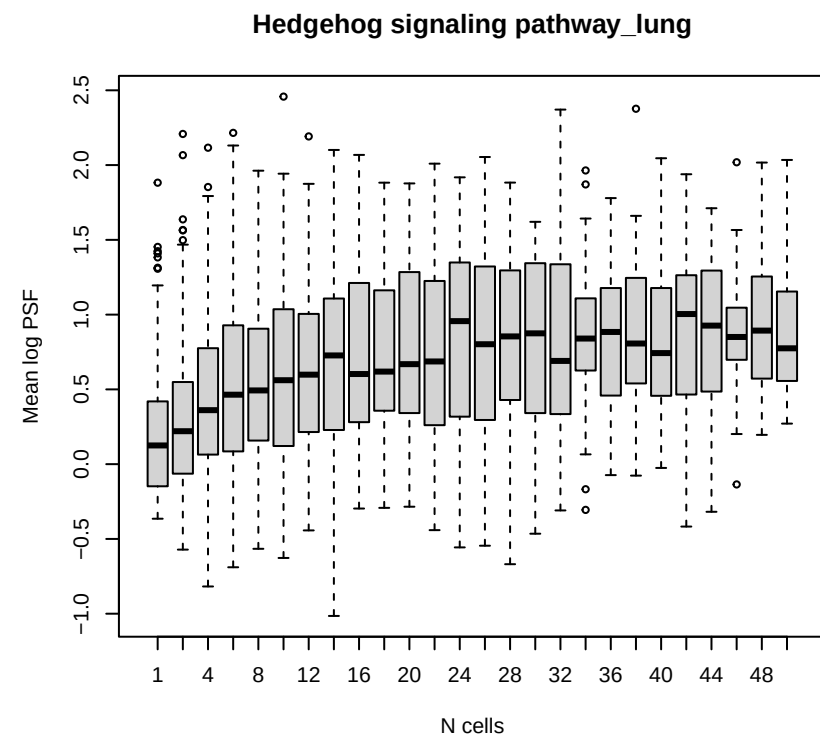
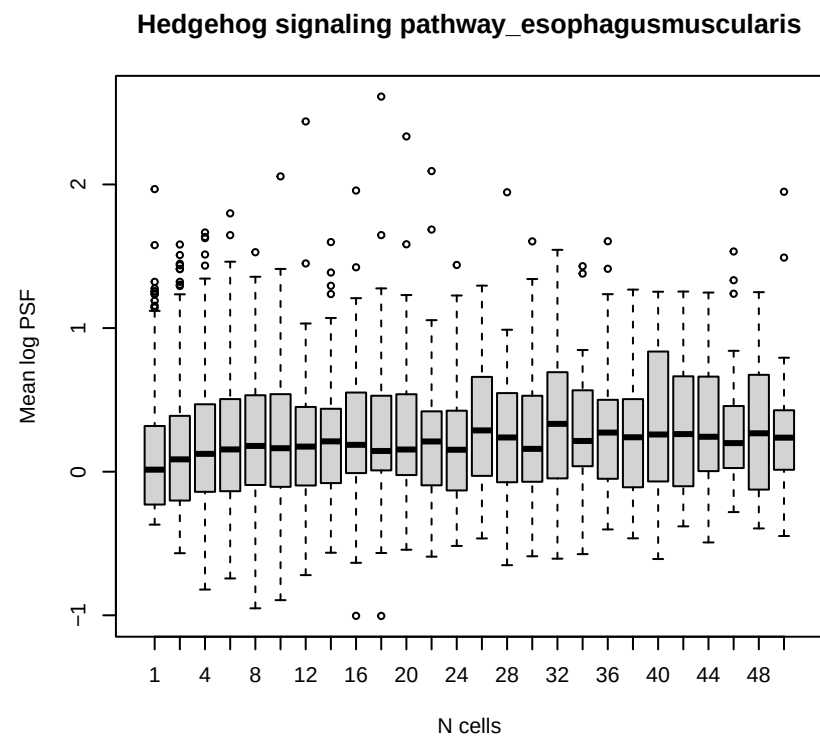
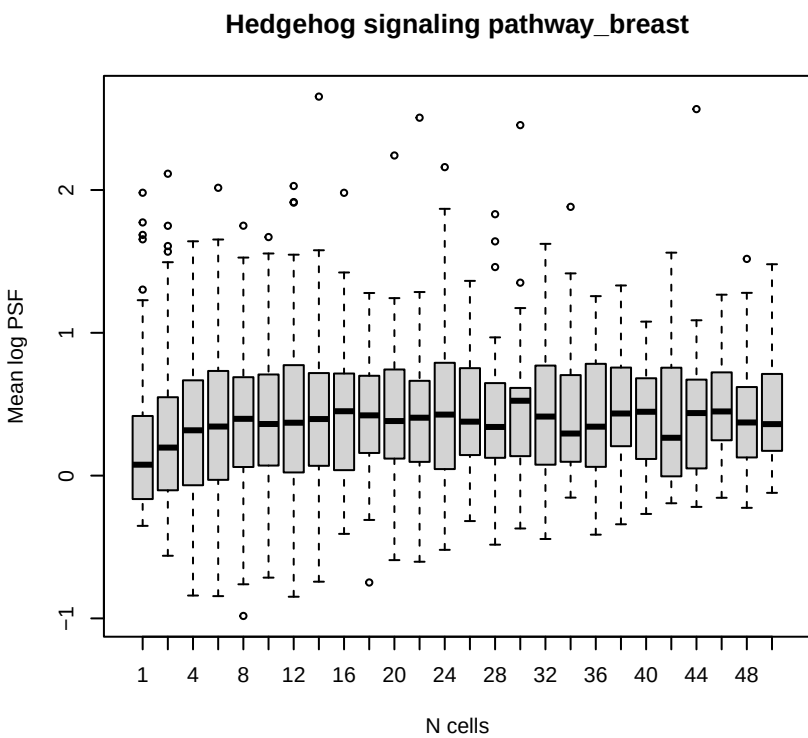
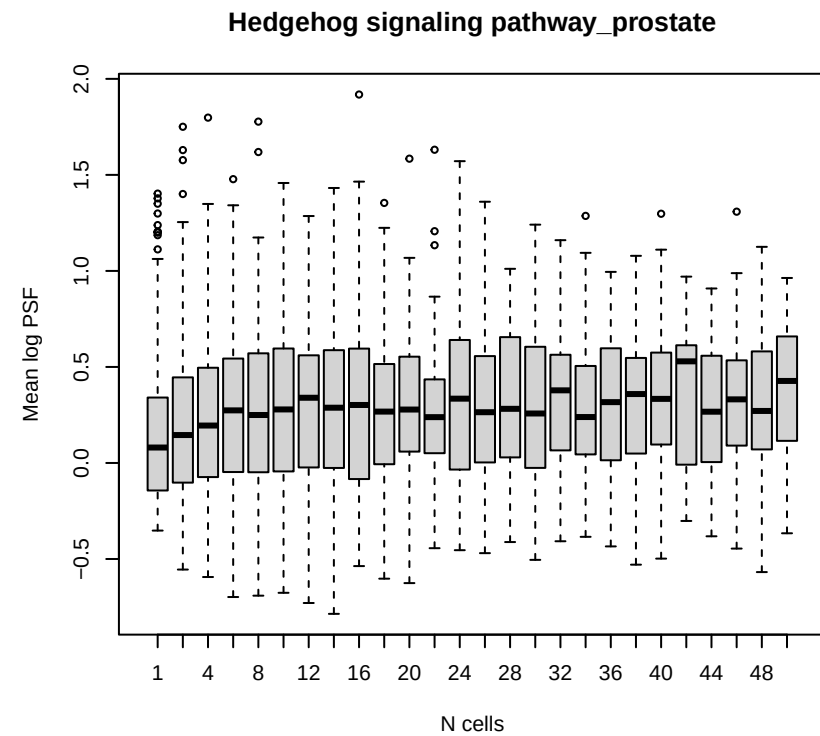
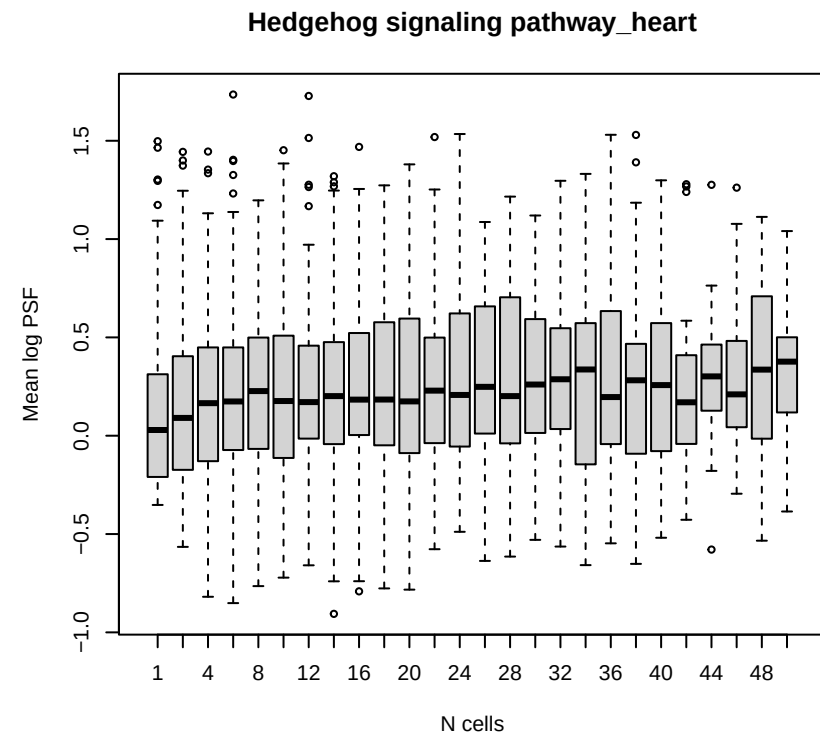
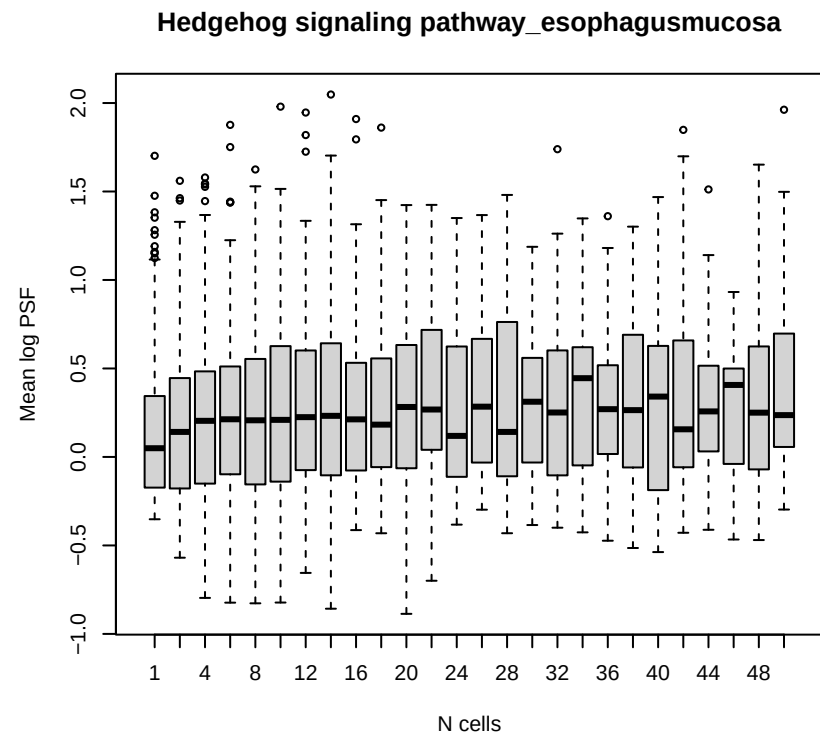
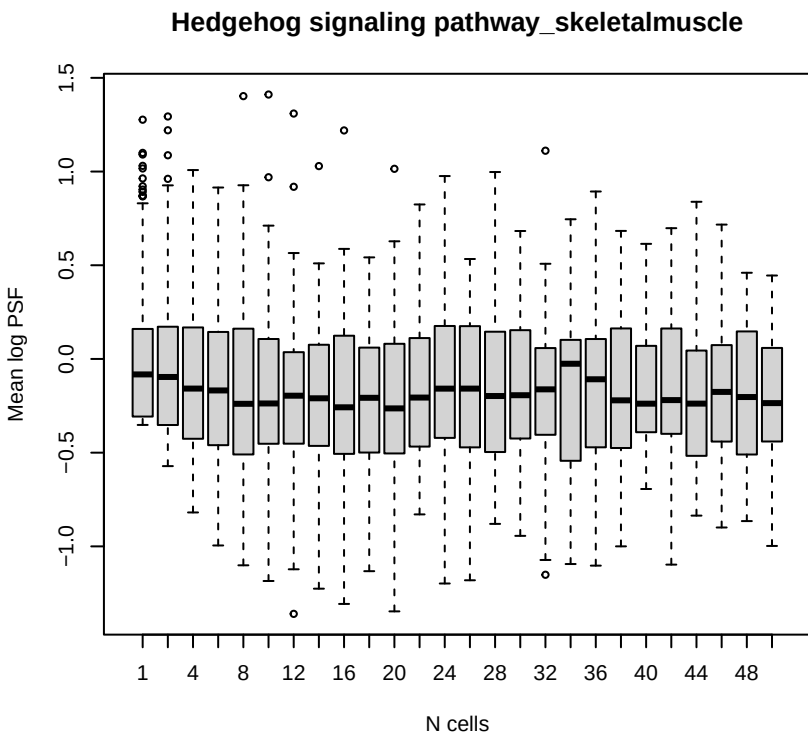


FoxO signaling pathway_lung

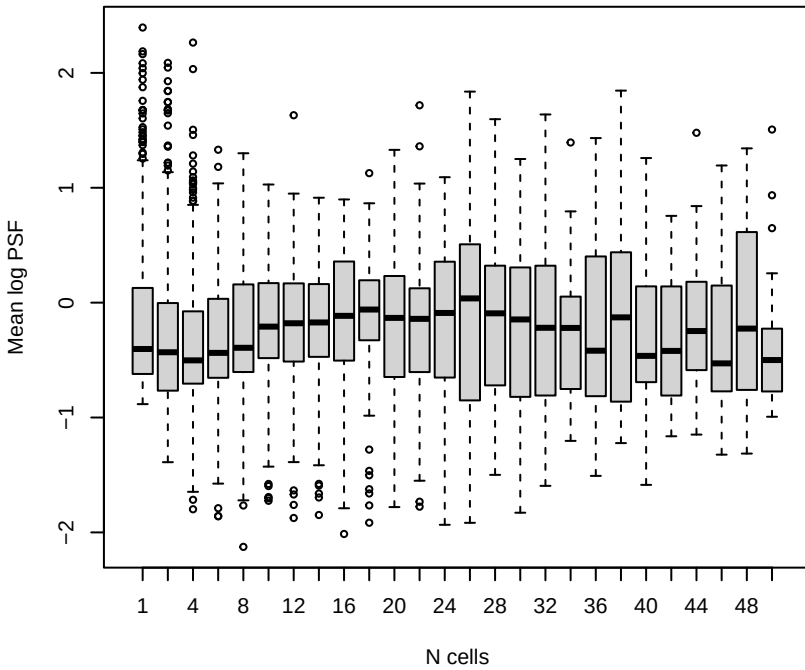


FoxO signaling pathway_skin

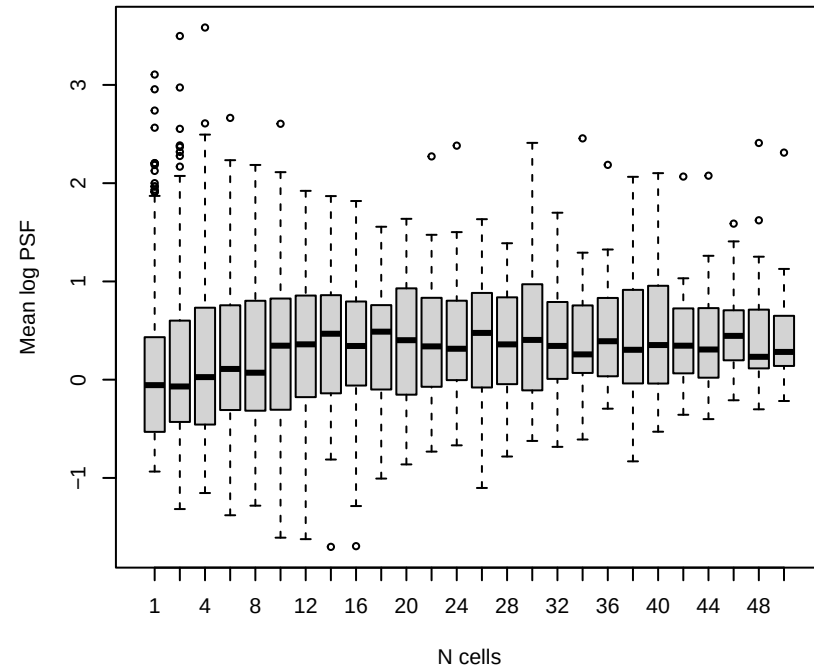




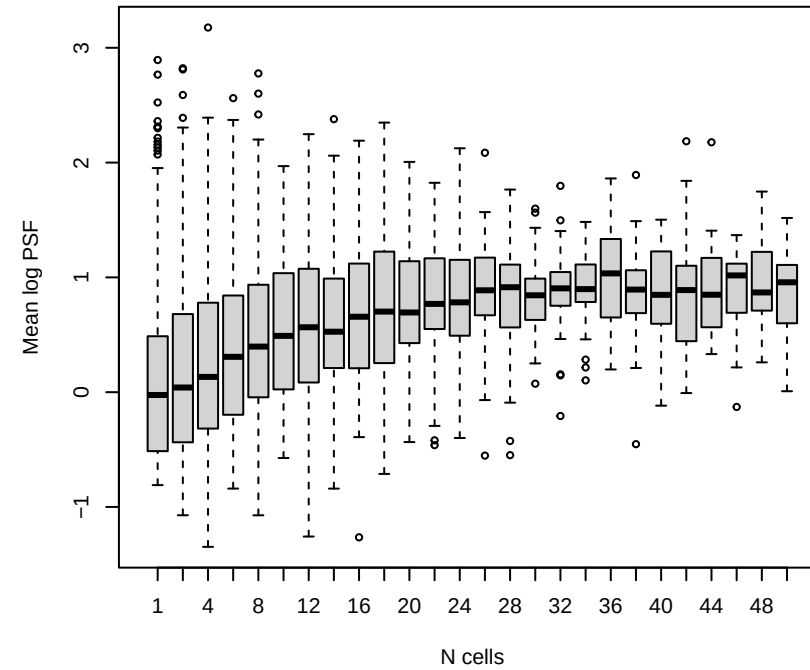
HIF-1 signaling pathway_skeletalmuscle



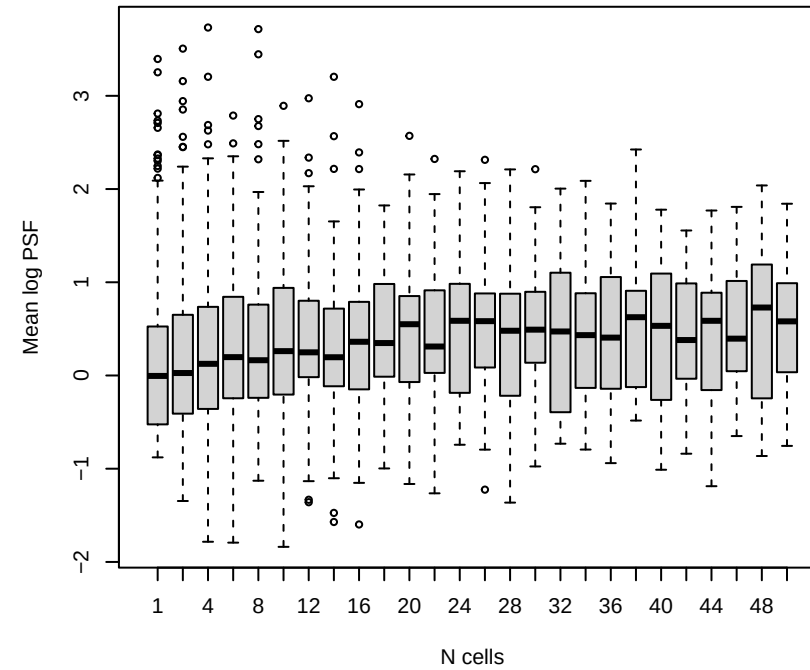
HIF-1 signaling pathway_esophagumucosa



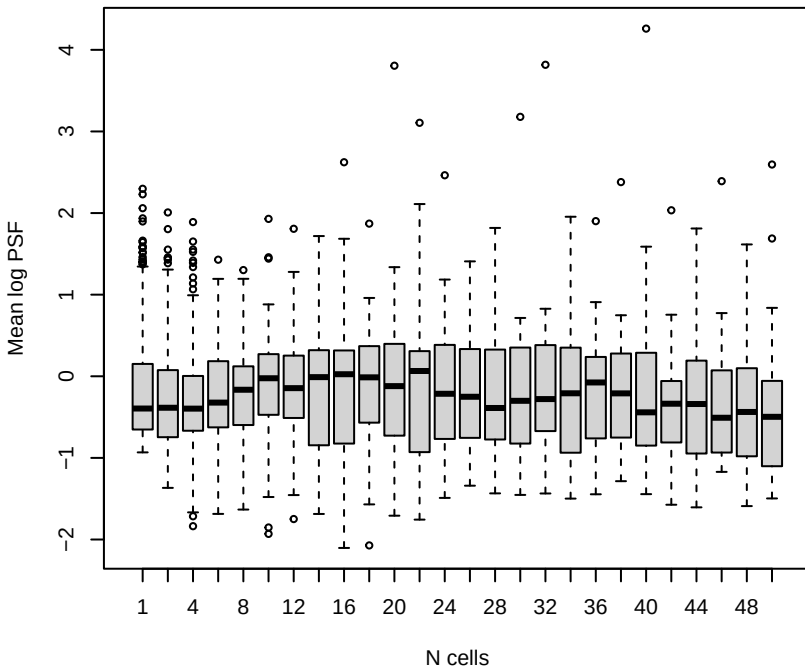
HIF-1 signaling pathway_heart



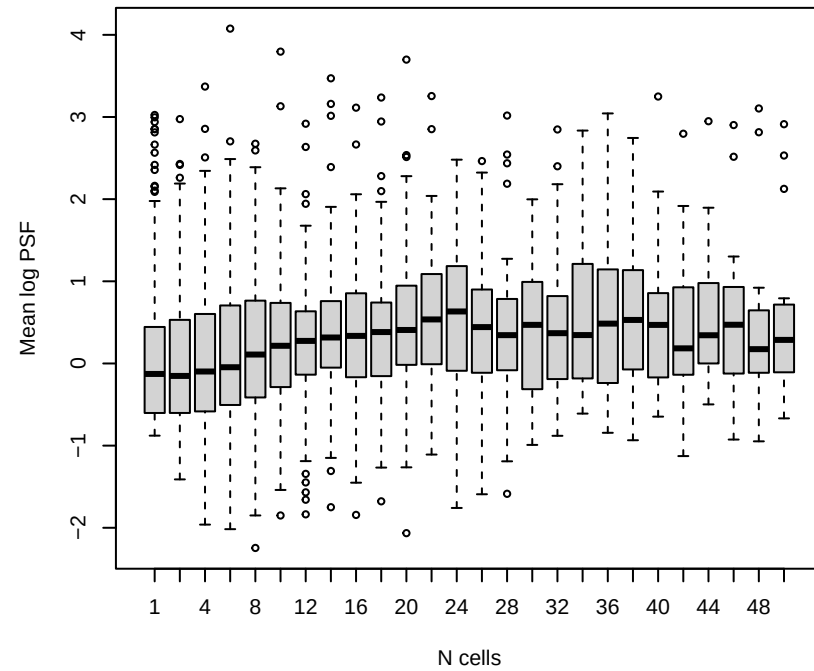
HIF-1 signaling pathway_prostate



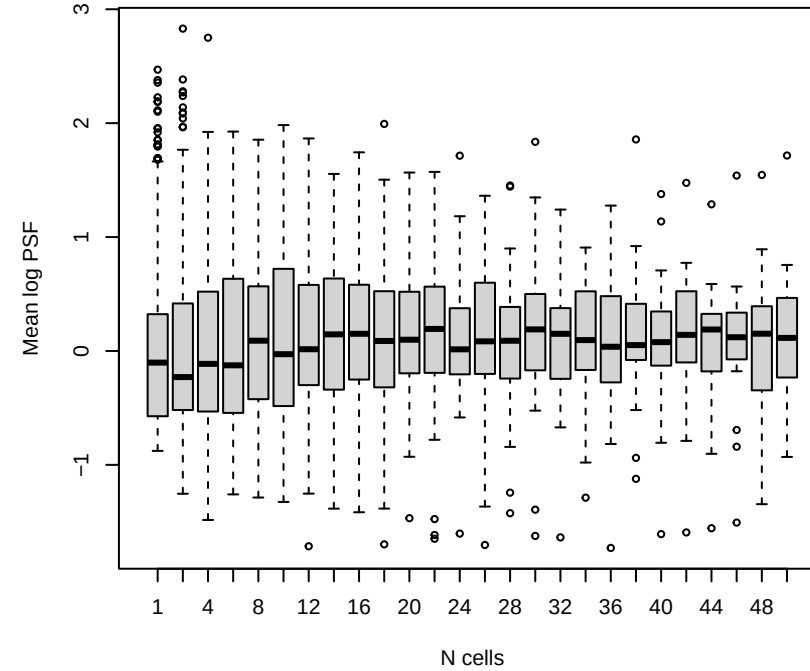
HIF-1 signaling pathway_breast



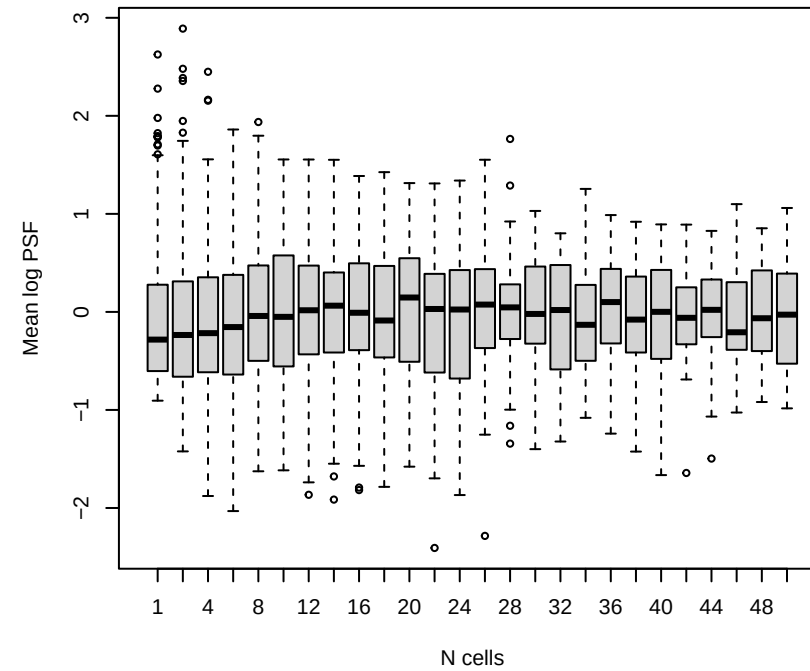
HIF-1 signaling pathway_esophagusmuscularis



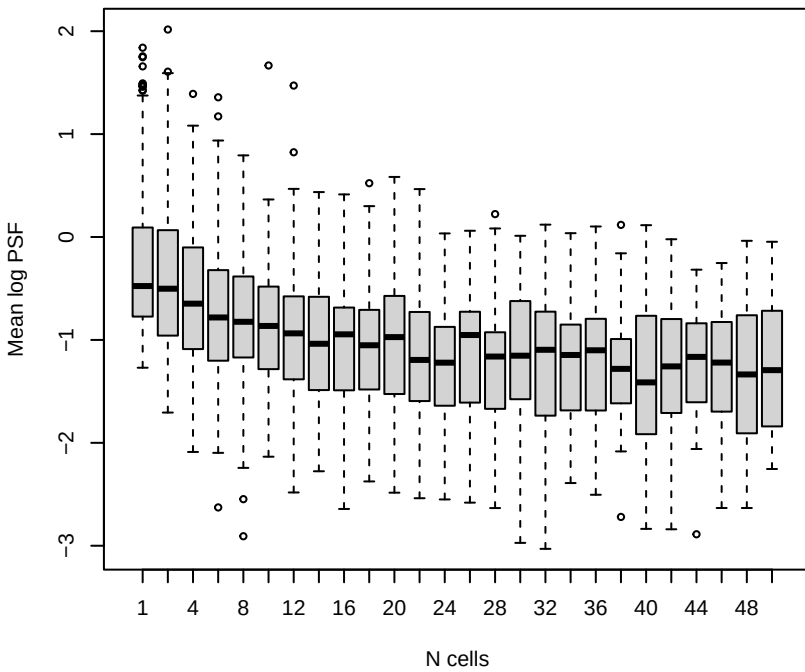
HIF-1 signaling pathway_lung



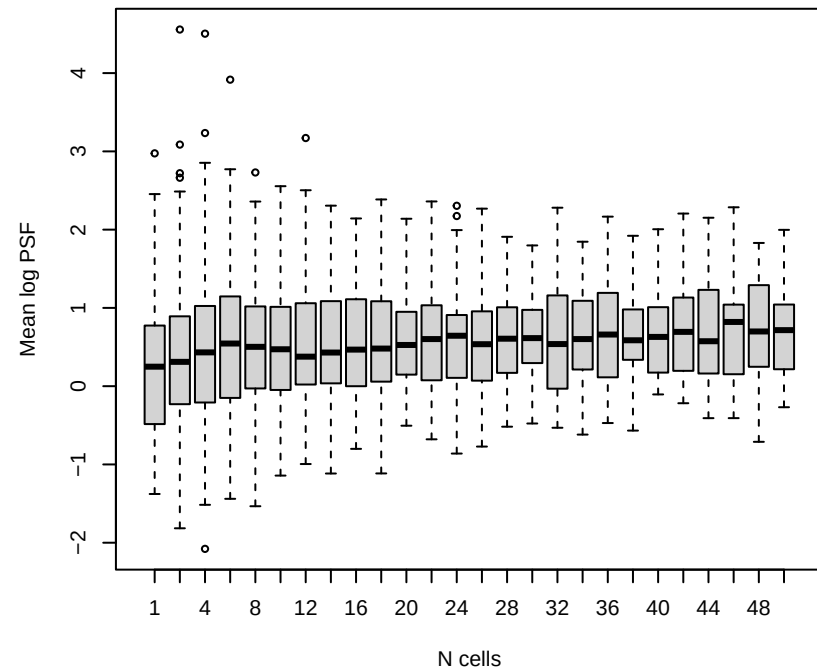
HIF-1 signaling pathway_skin



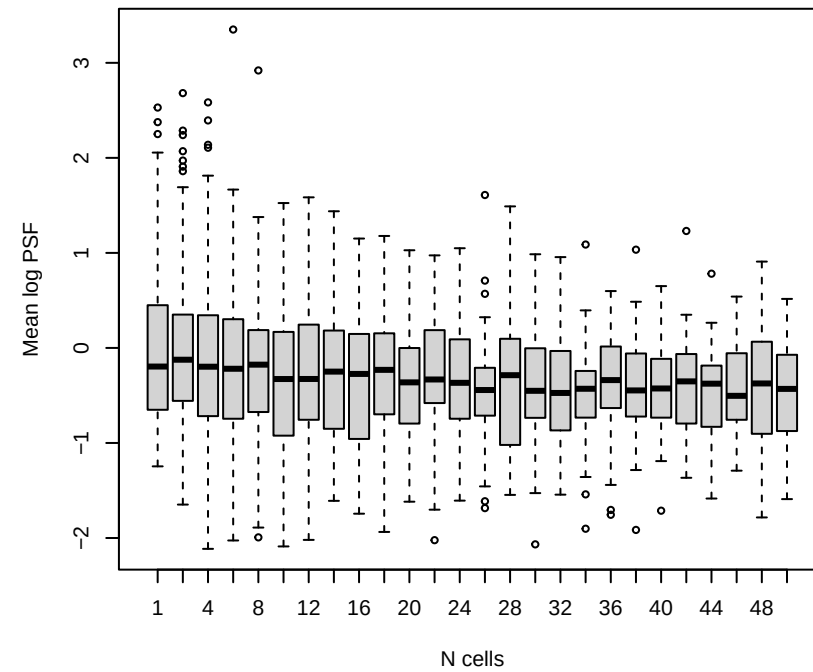
Hippo signaling pathway_skeletalmuscle



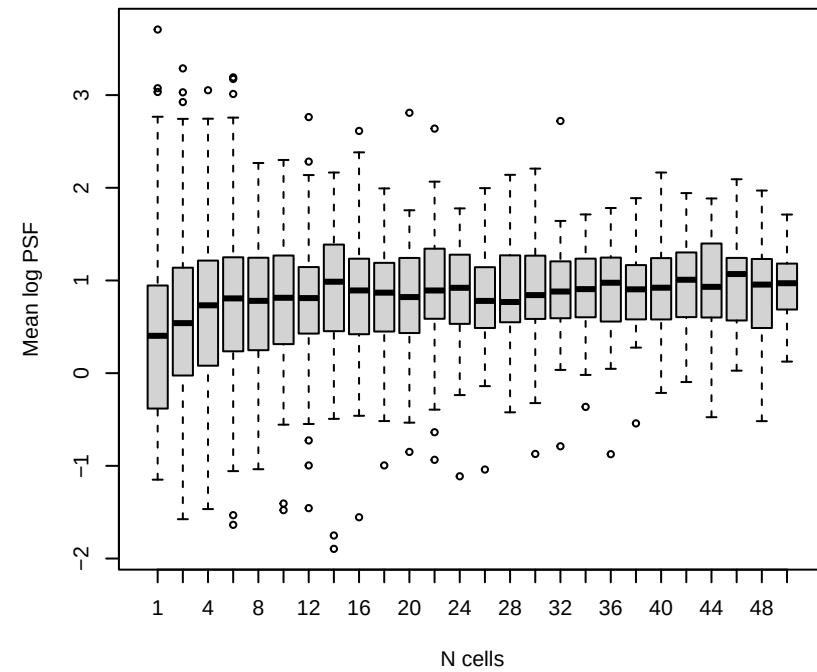
Hippo signaling pathway_esophagasmucosa



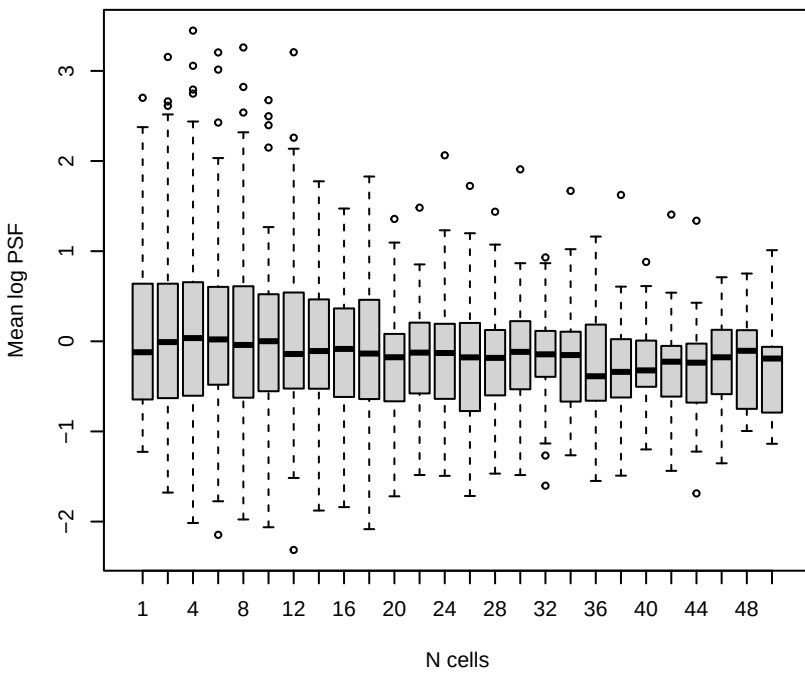
Hippo signaling pathway_heart



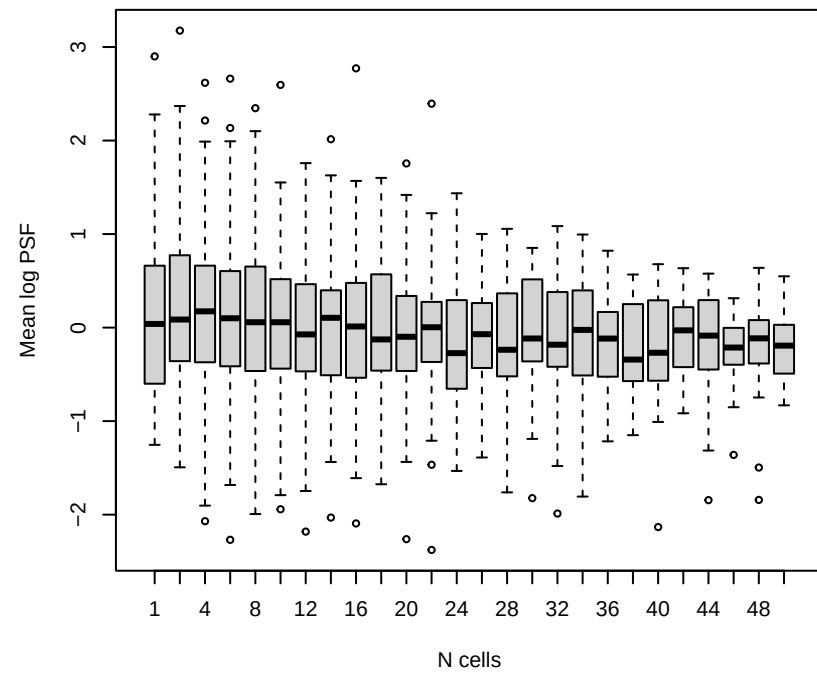
Hippo signaling pathway_prostate



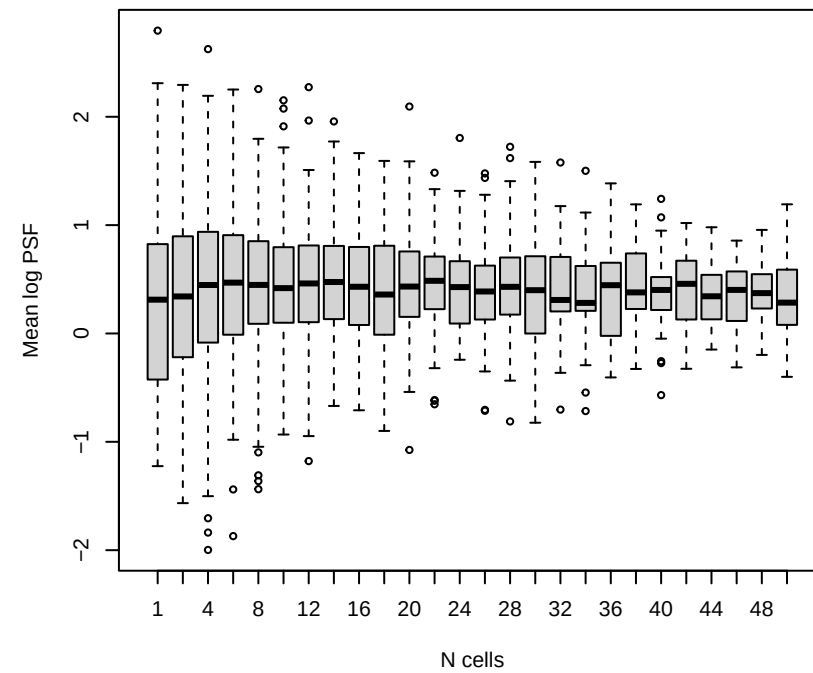
Hippo signaling pathway_breast



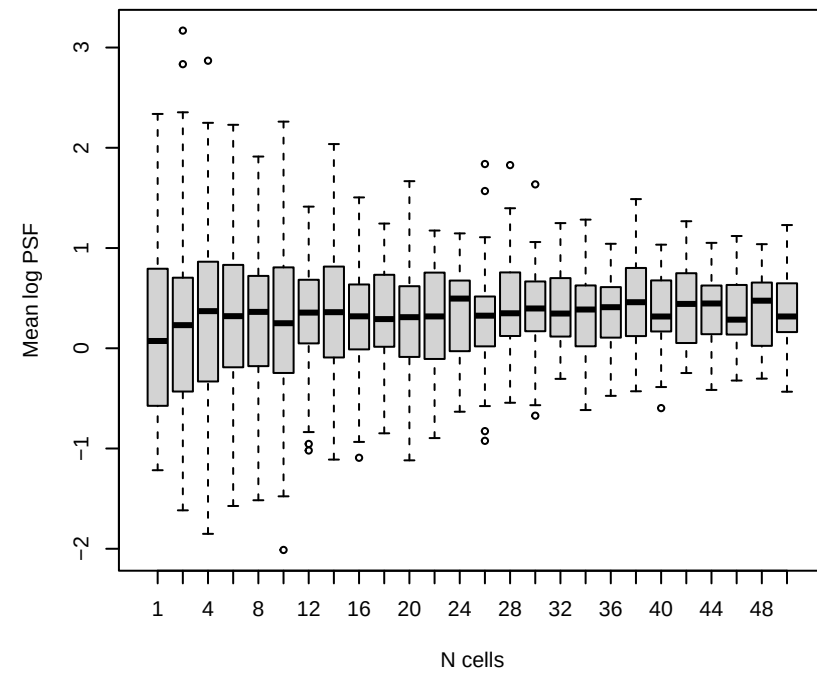
Hippo signaling pathway_esophagusmuscularis



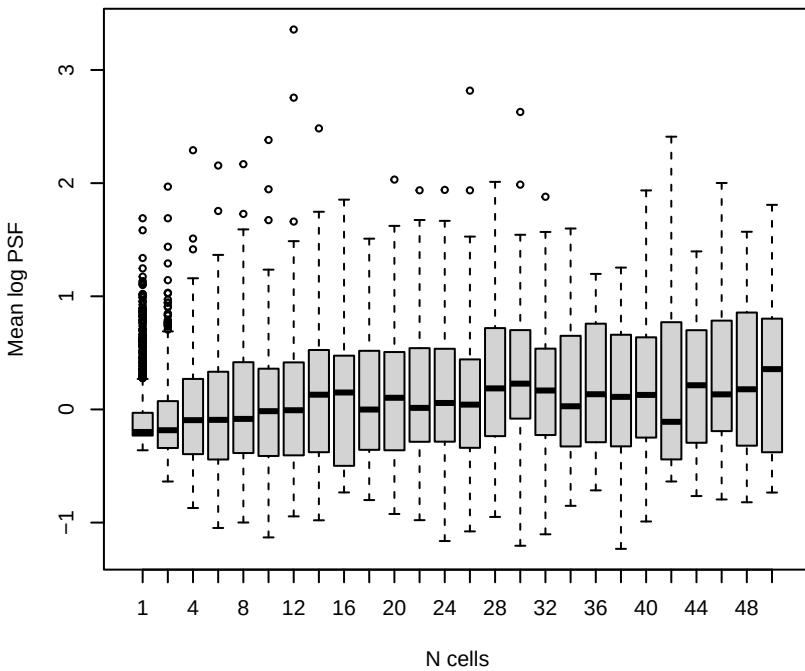
Hippo signaling pathway_lung



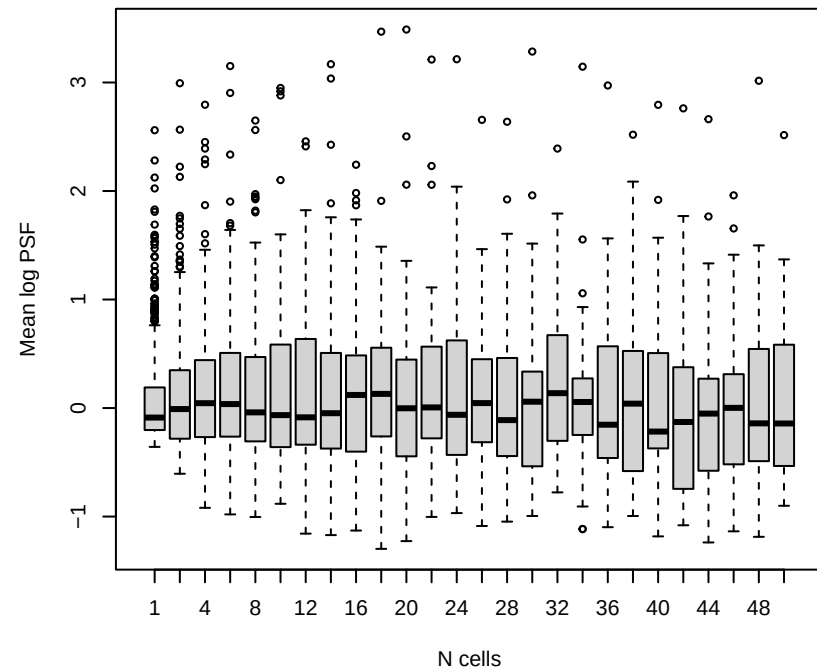
Hippo signaling pathway_skin



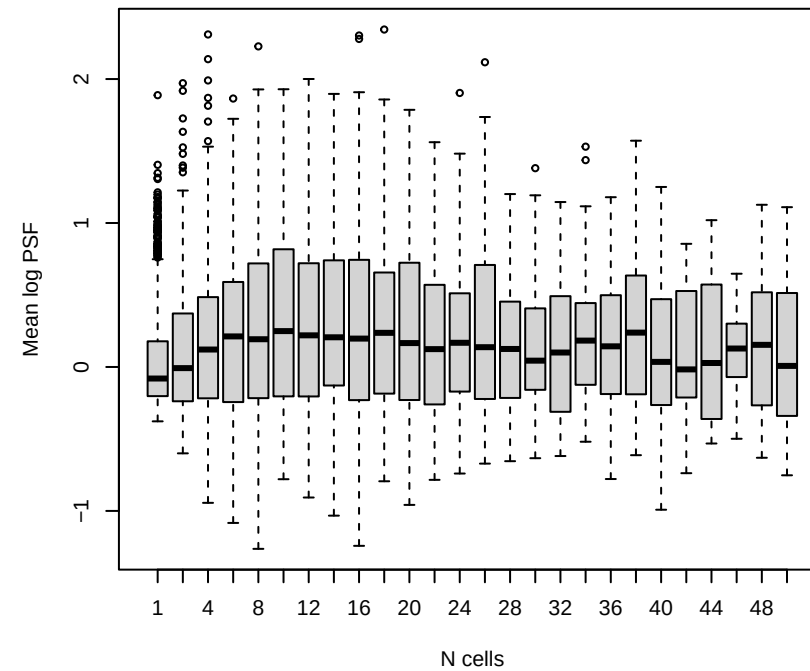
IL-17 signaling pathway_skeletalmuscle



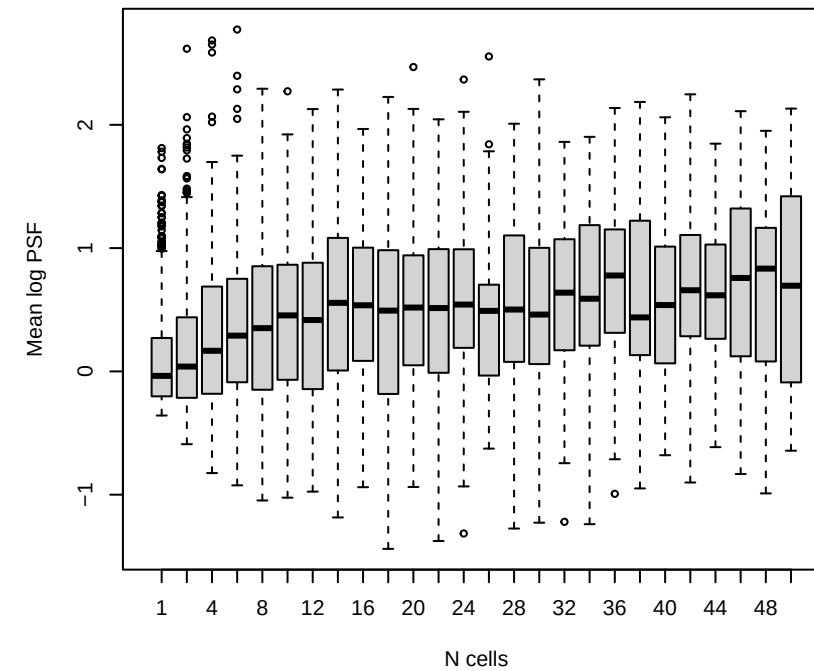
IL-17 signaling pathway_esophagasmucosa



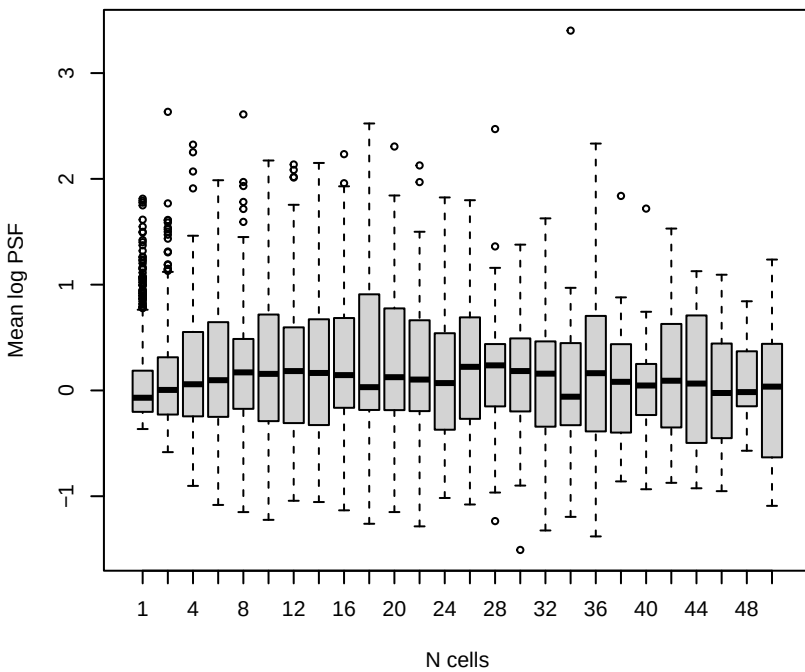
IL-17 signaling pathway_heart



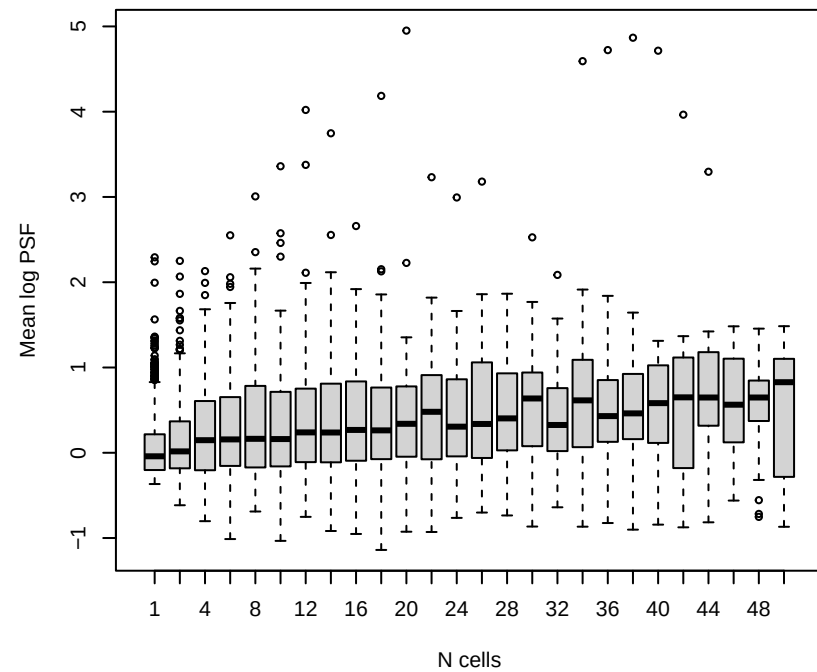
IL-17 signaling pathway_prostate



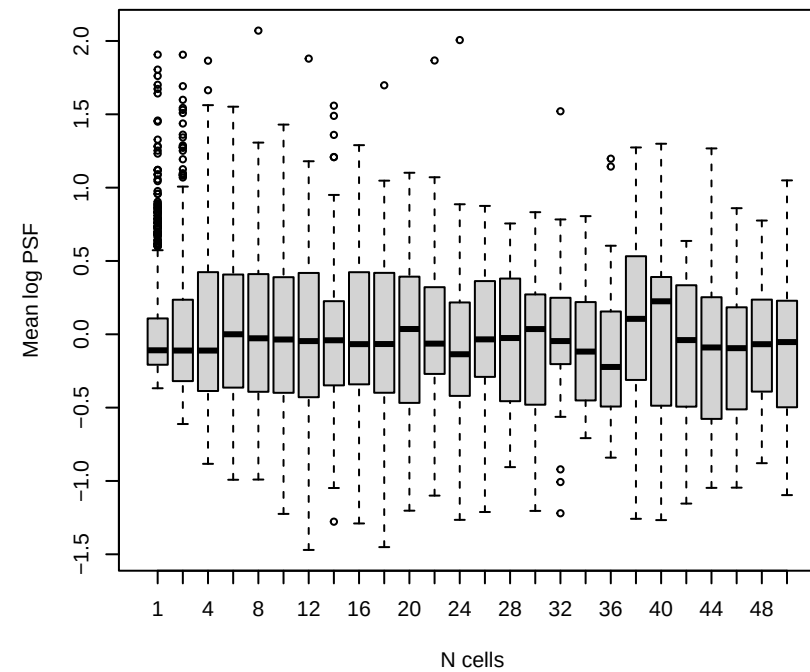
IL-17 signaling pathway_breast



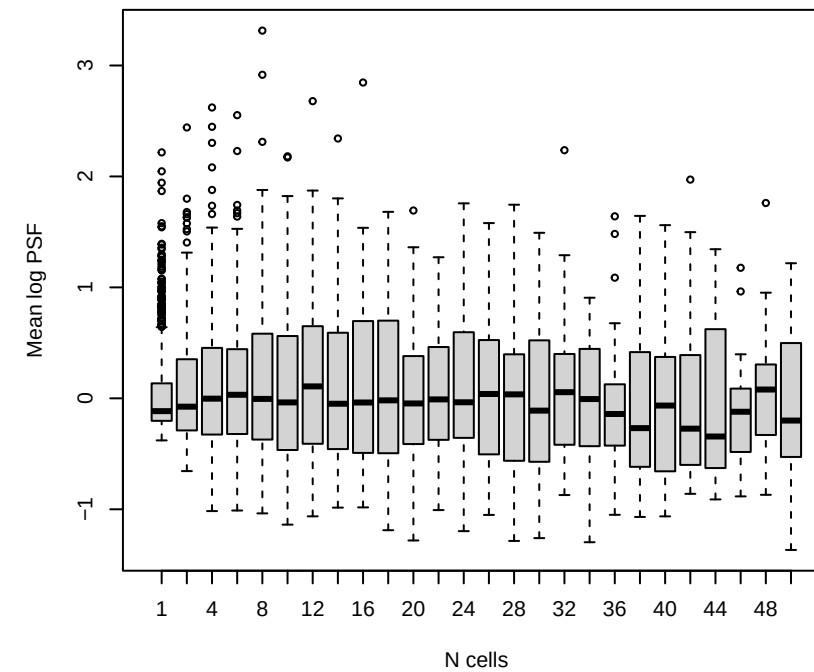
IL-17 signaling pathway_esophagusmuscularis



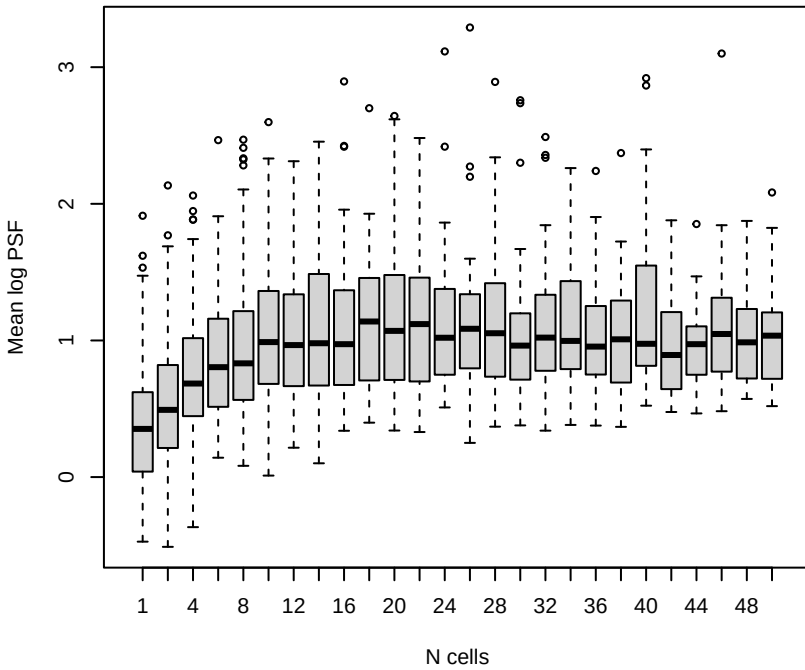
IL-17 signaling pathway_lung



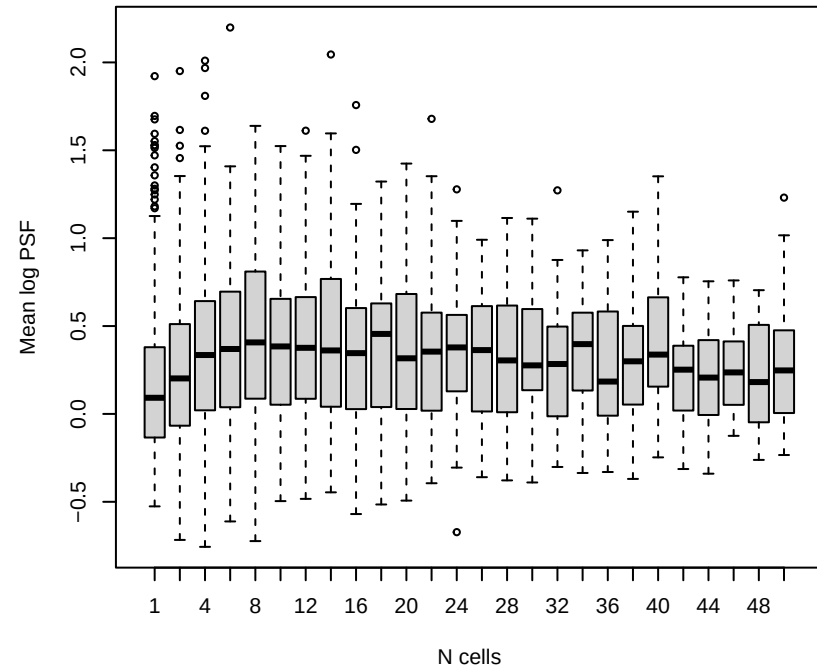
IL-17 signaling pathway_skin



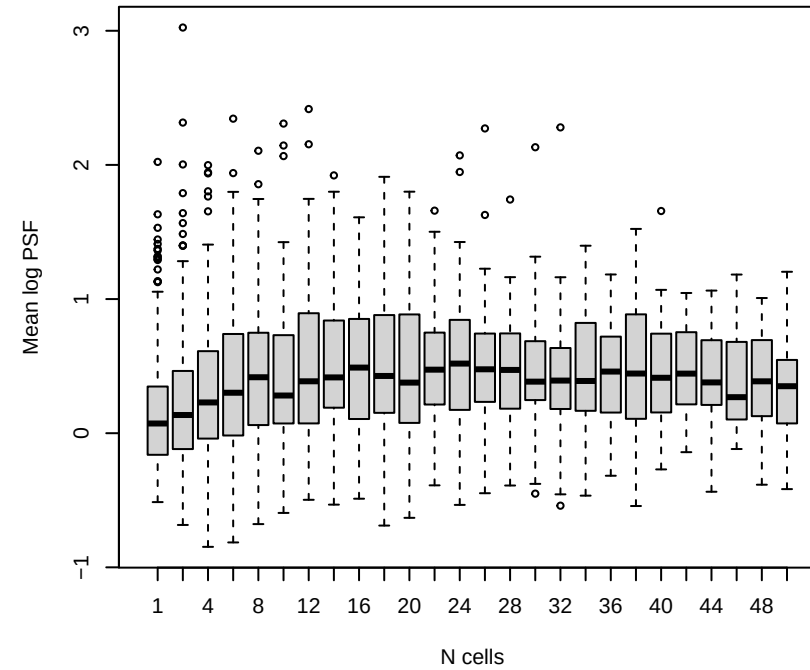
Insulin signaling pathway_skeletalmuscle



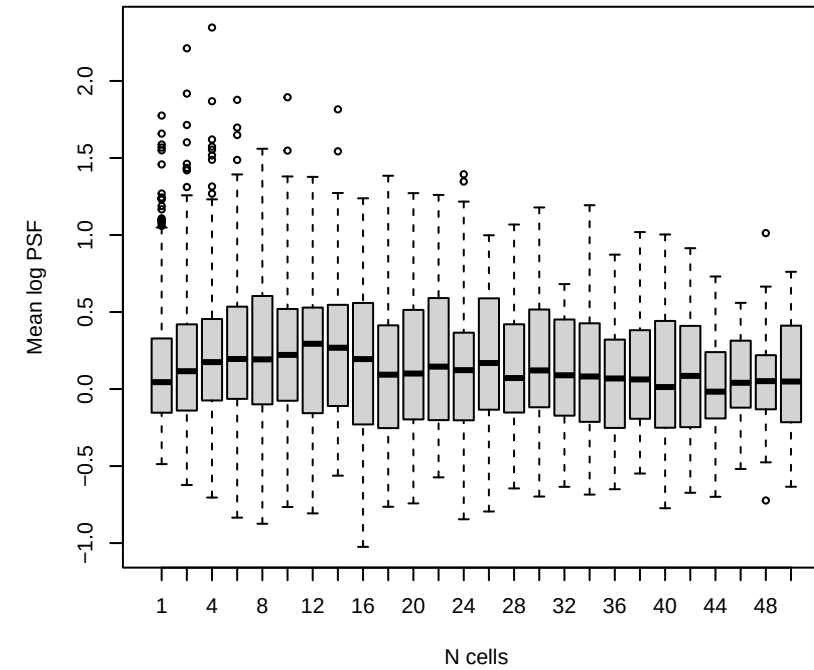
Insulin signaling pathway_esophagusmucosa



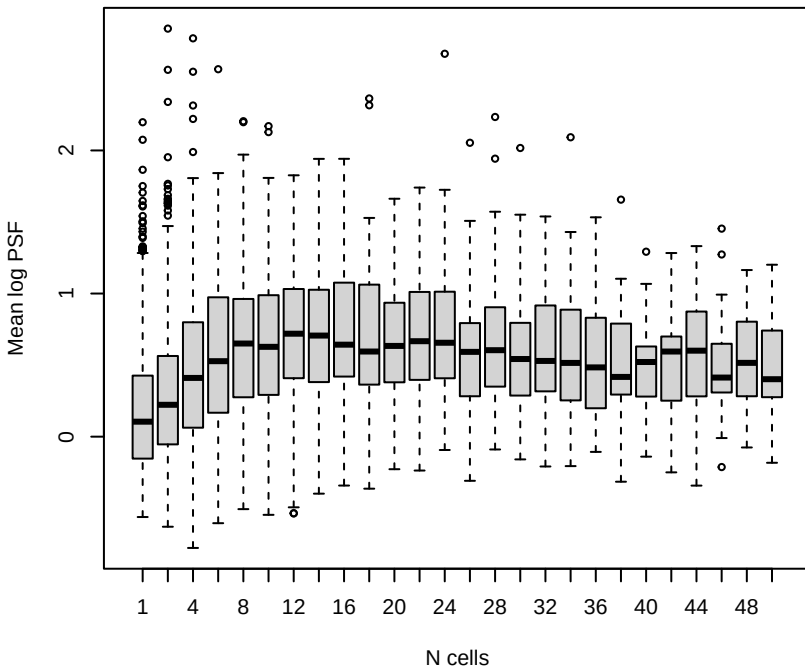
Insulin signaling pathway_heart



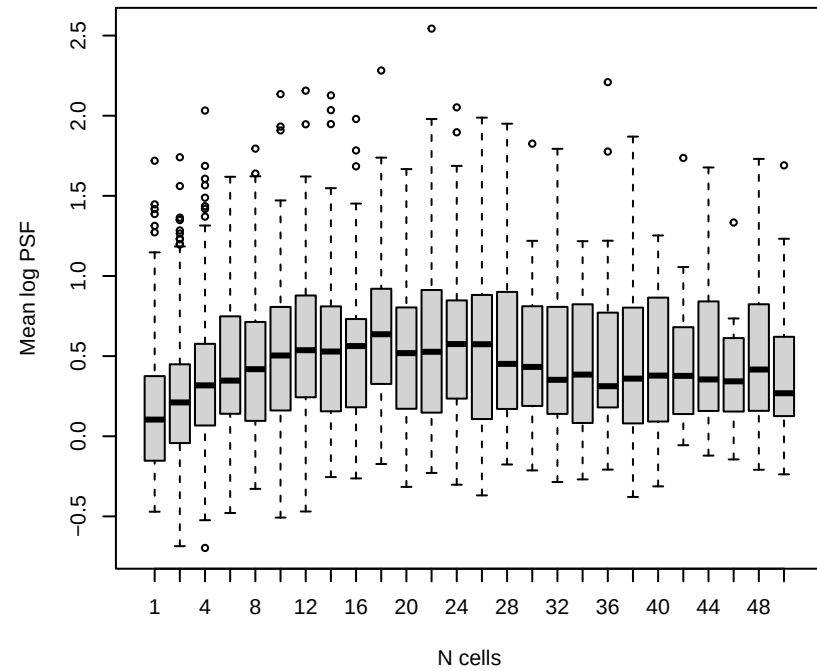
Insulin signaling pathway_prostate



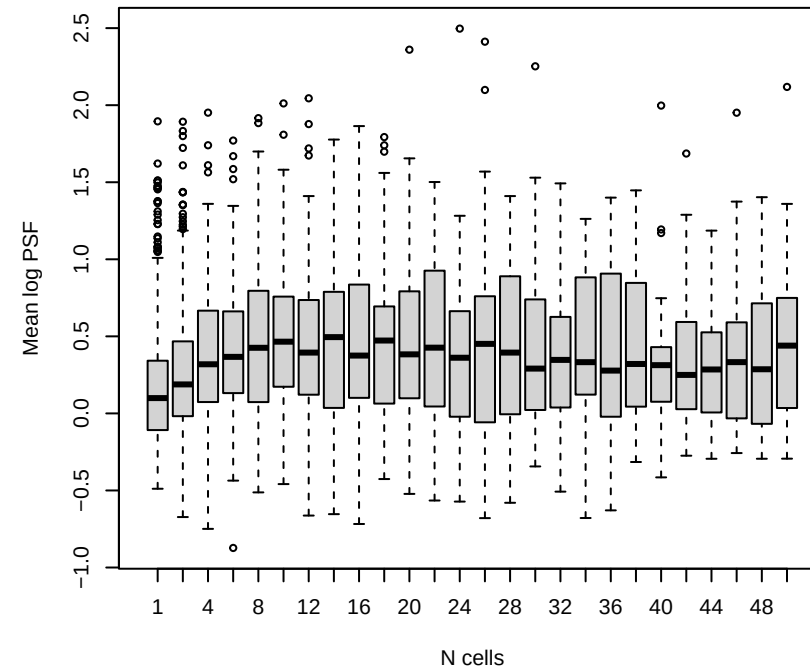
Insulin signaling pathway_breast



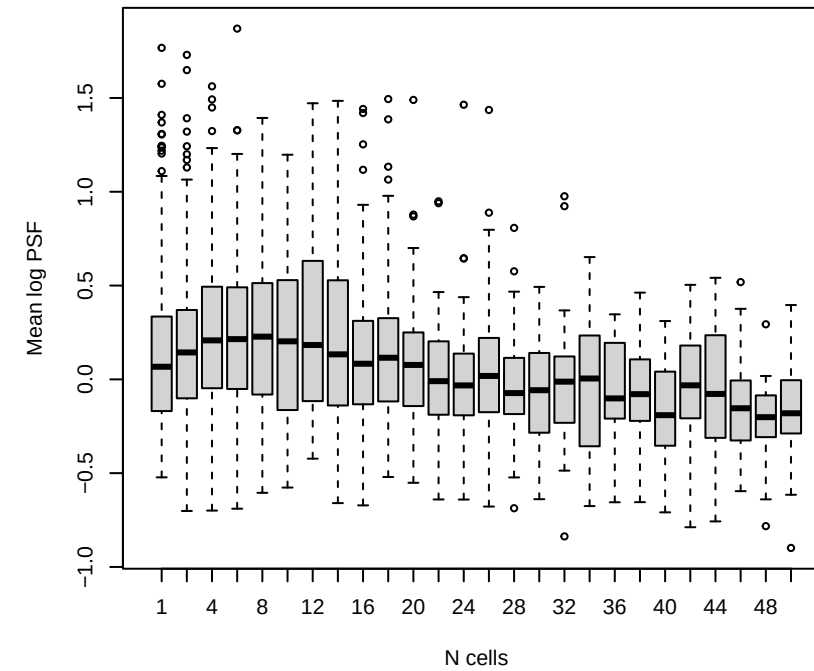
Insulin signaling pathway_esophagusmuscularis



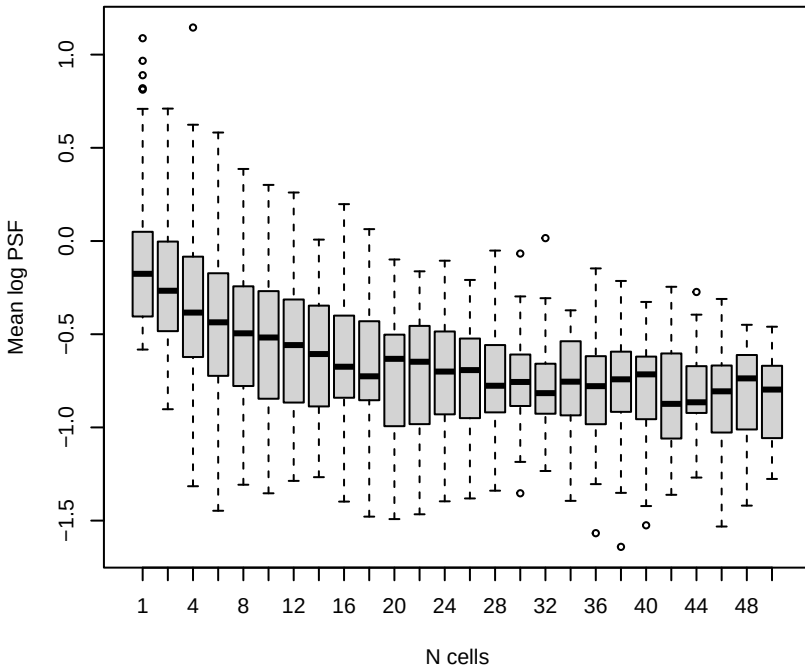
Insulin signaling pathway_lung



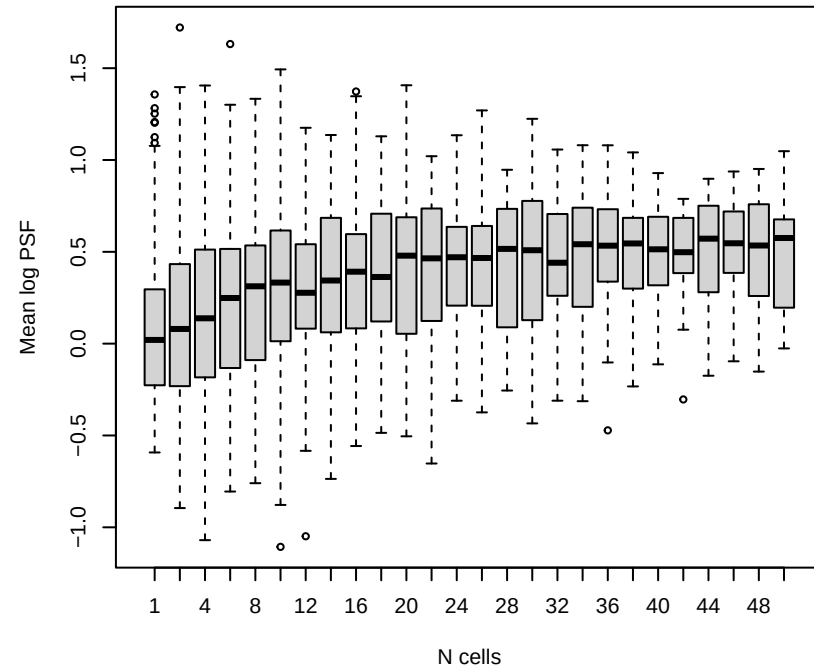
Insulin signaling pathway_skin



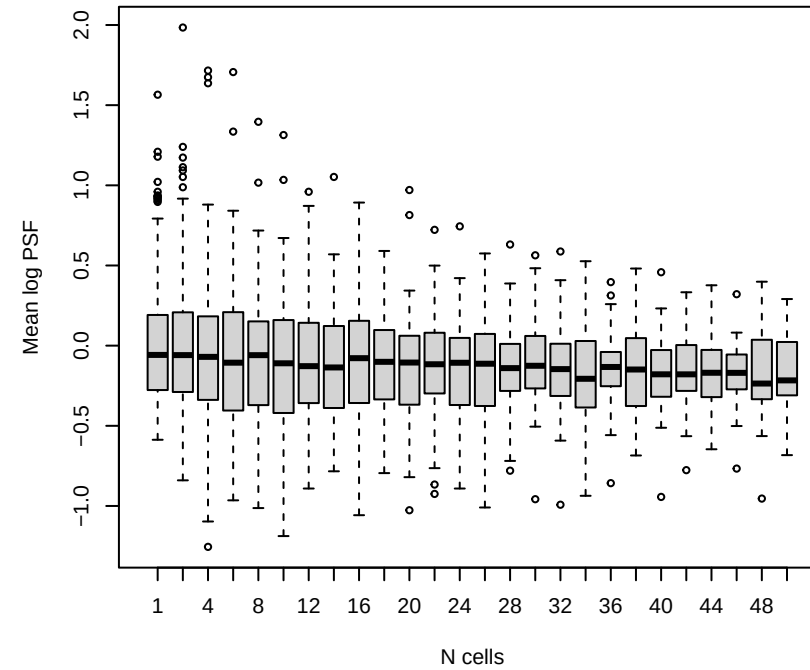
JAK-STAT signaling pathway_skeletalmuscle



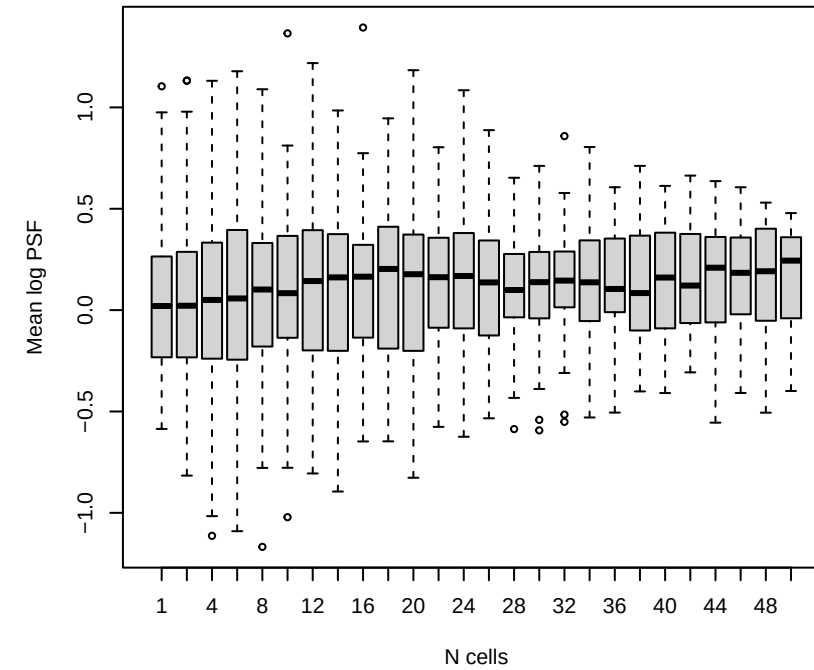
JAK-STAT signaling pathway_esophagasmucosa



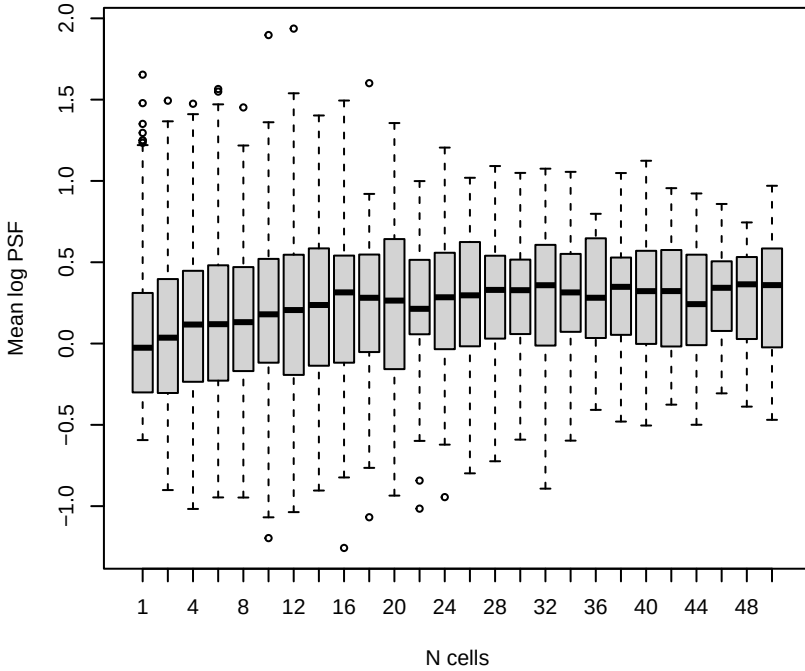
JAK-STAT signaling pathway_heart



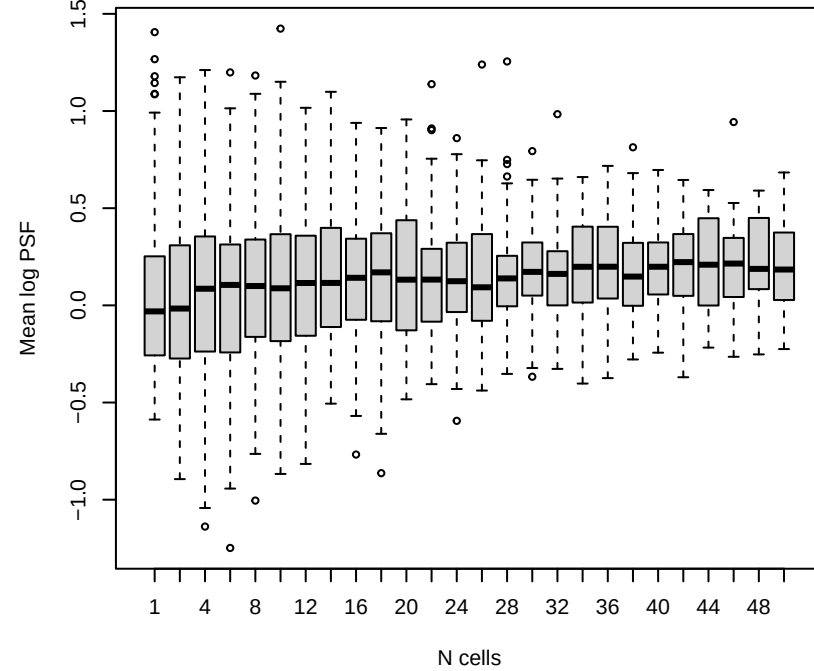
JAK-STAT signaling pathway_prostate



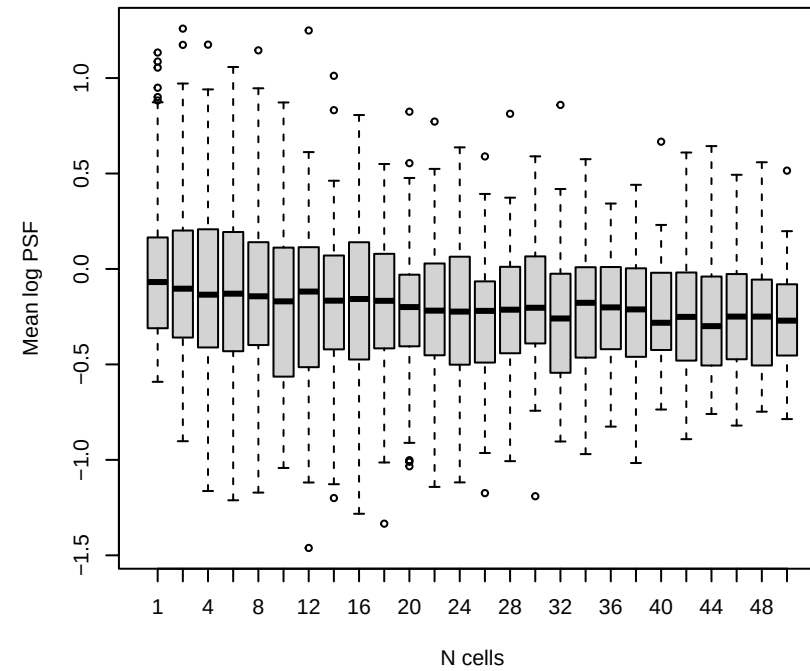
JAK-STAT signaling pathway_breast



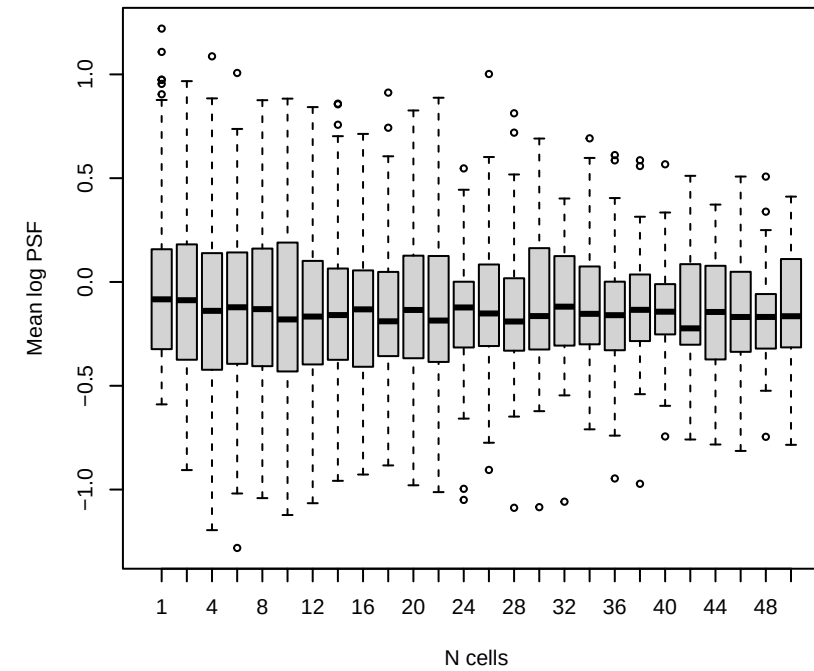
JAK-STAT signaling pathway_esophagusmuscularis



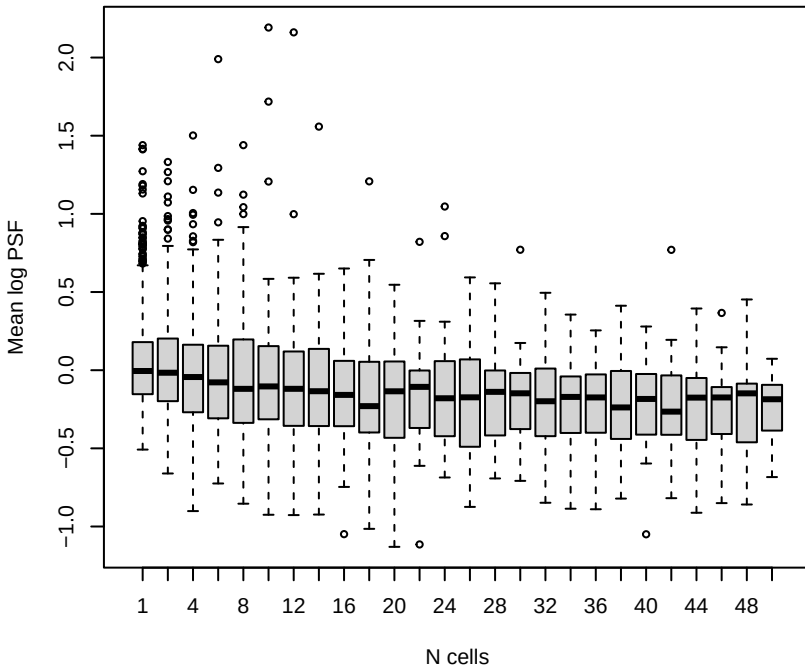
JAK-STAT signaling pathway_lung



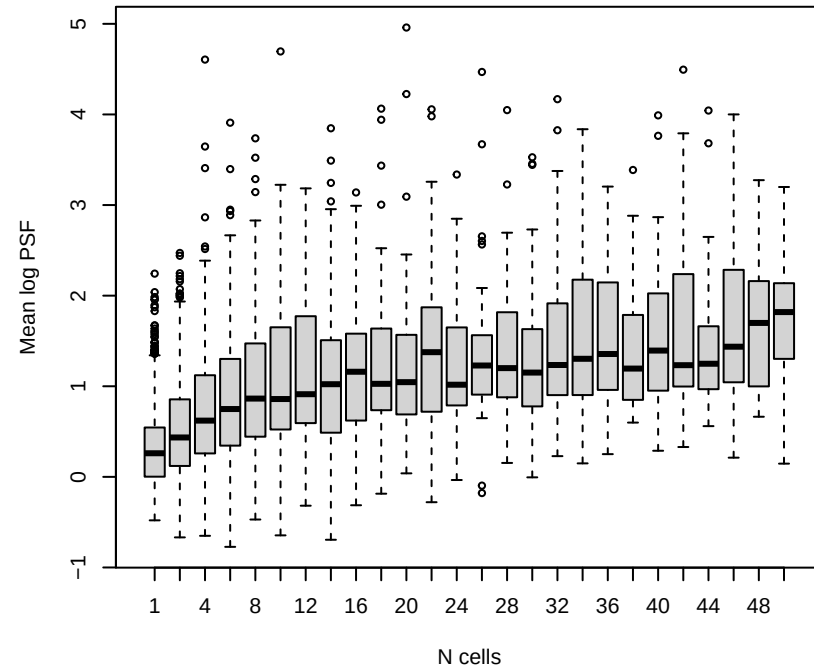
JAK-STAT signaling pathway_skin



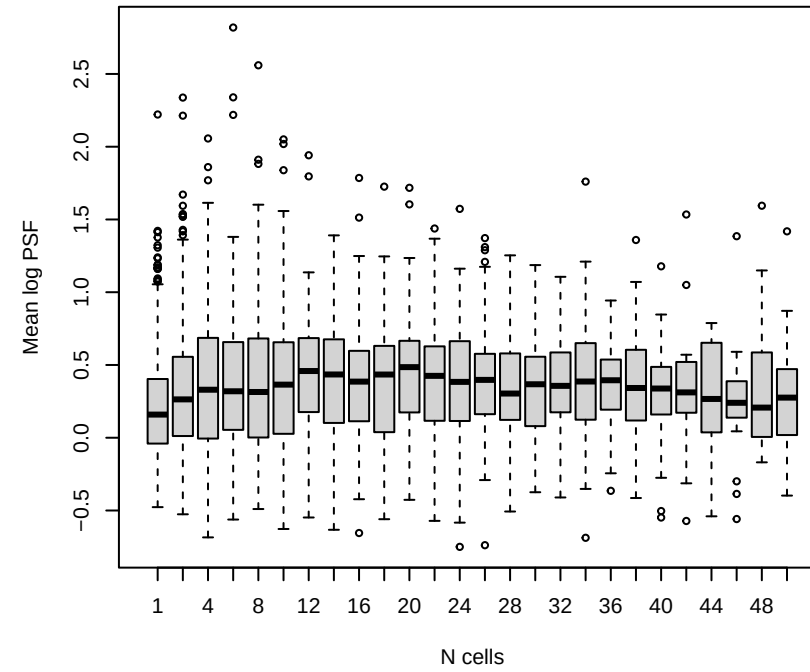
MAPK signaling pathway_skeletalmuscle



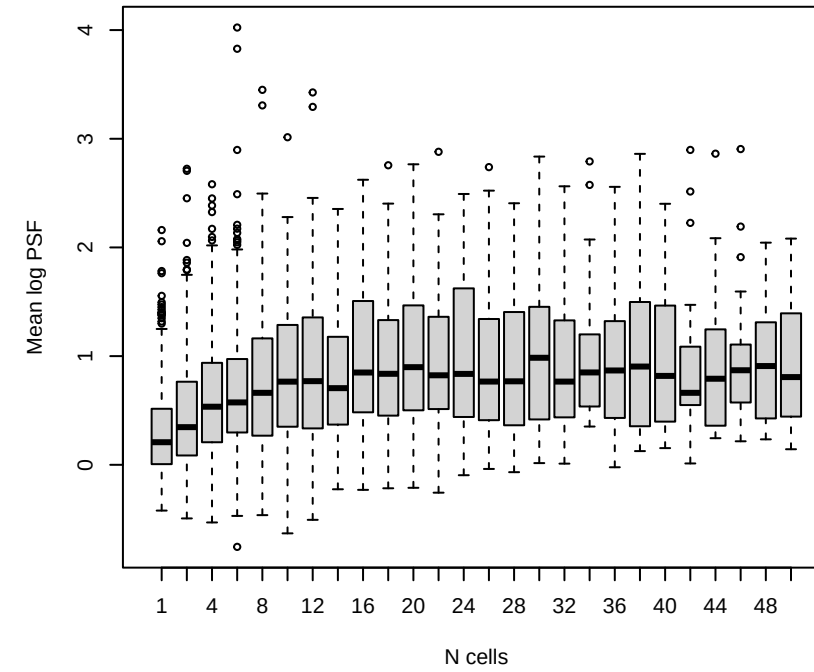
MAPK signaling pathway_esophagumucosa



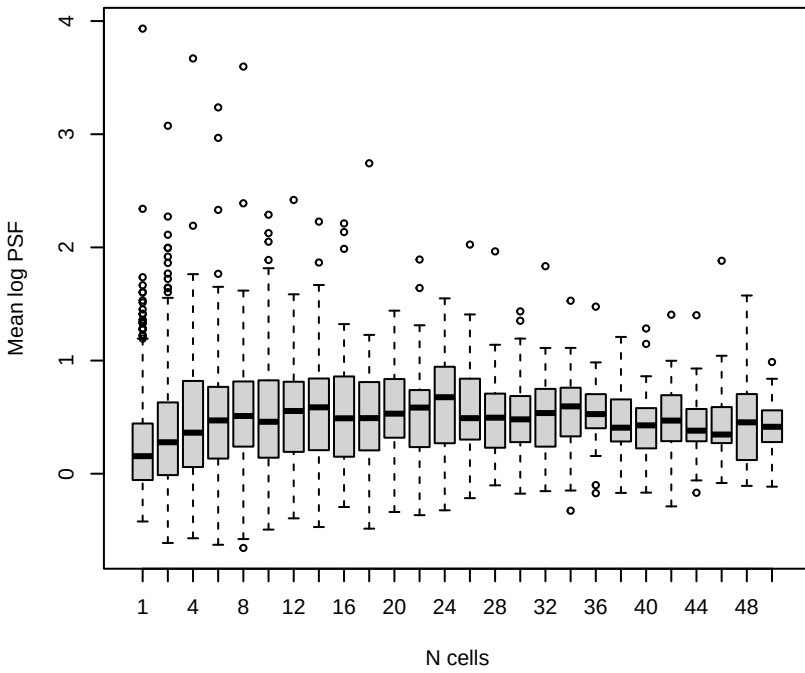
MAPK signaling pathway_heart



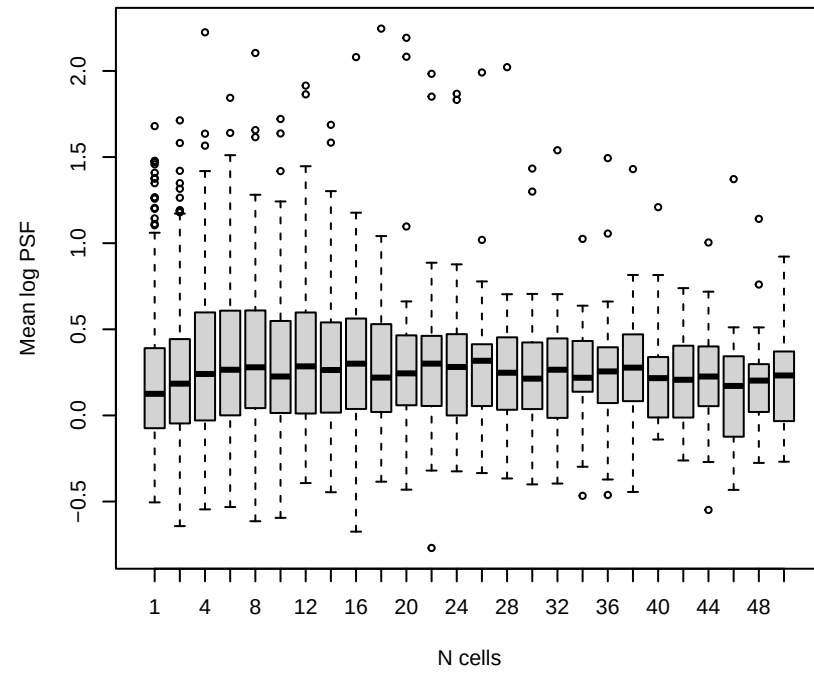
MAPK signaling pathway_prostate



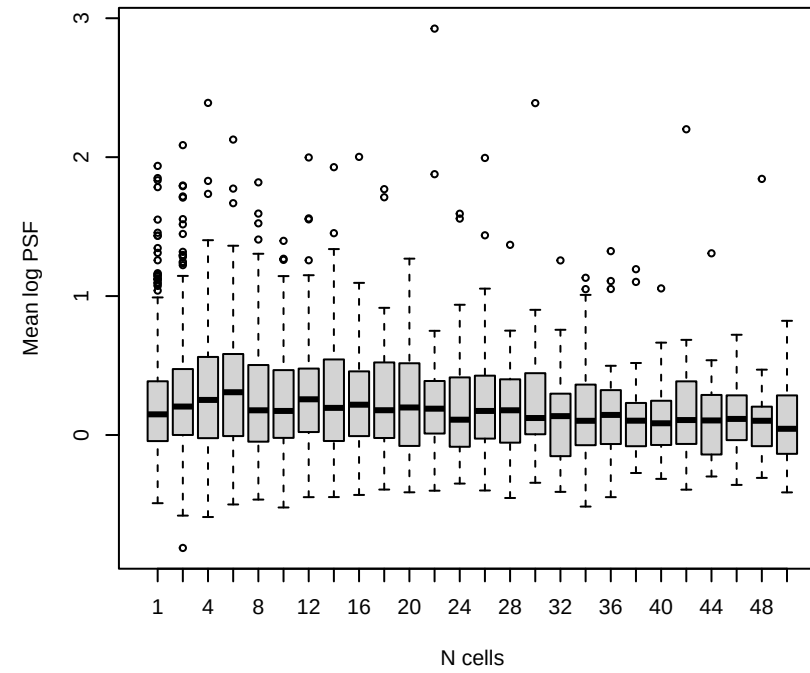
MAPK signaling pathway_breast



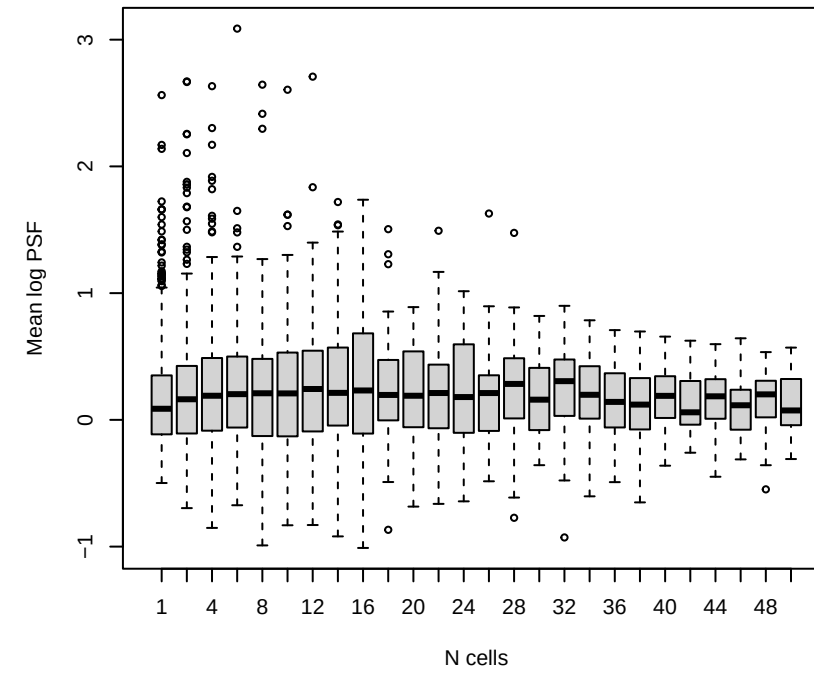
MAPK signaling pathway_esophagusmuscularis



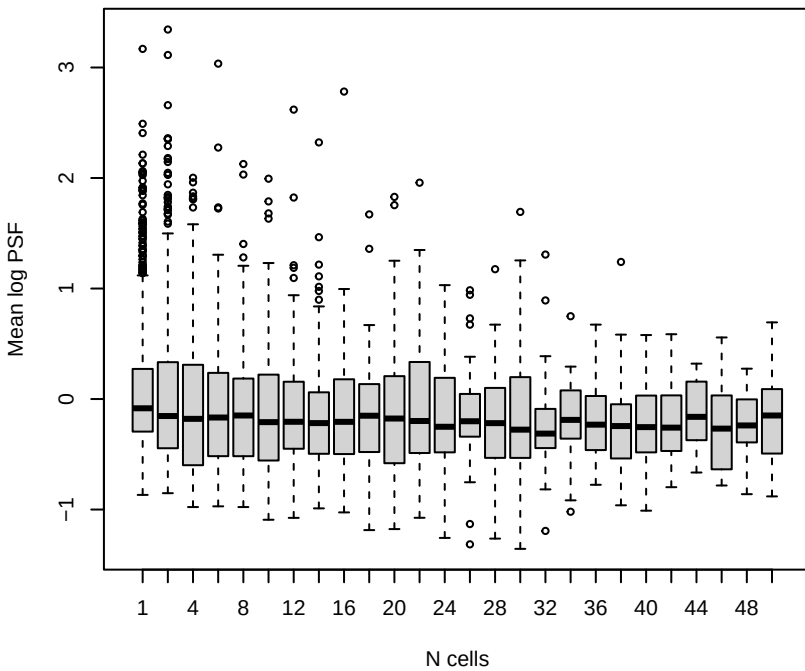
MAPK signaling pathway_lung



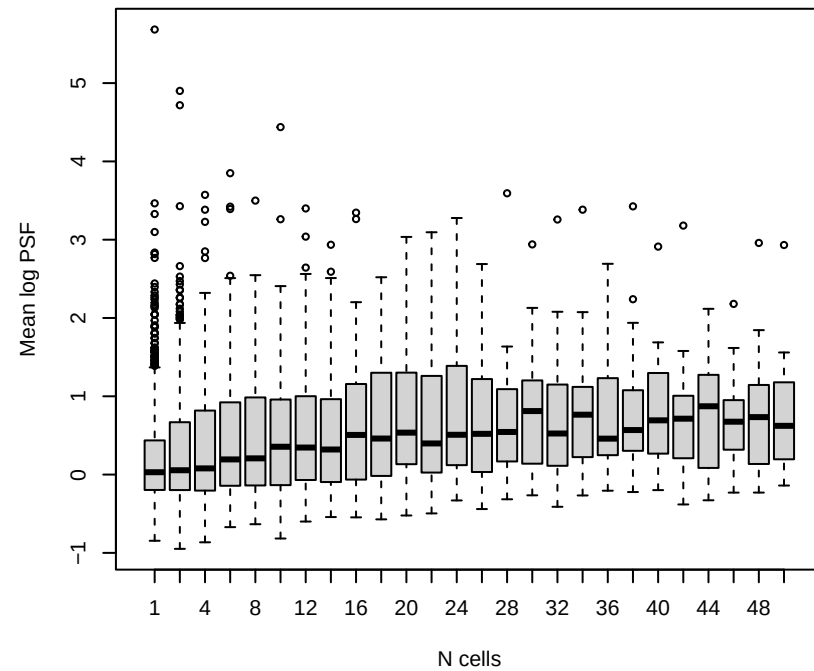
MAPK signaling pathway_skin



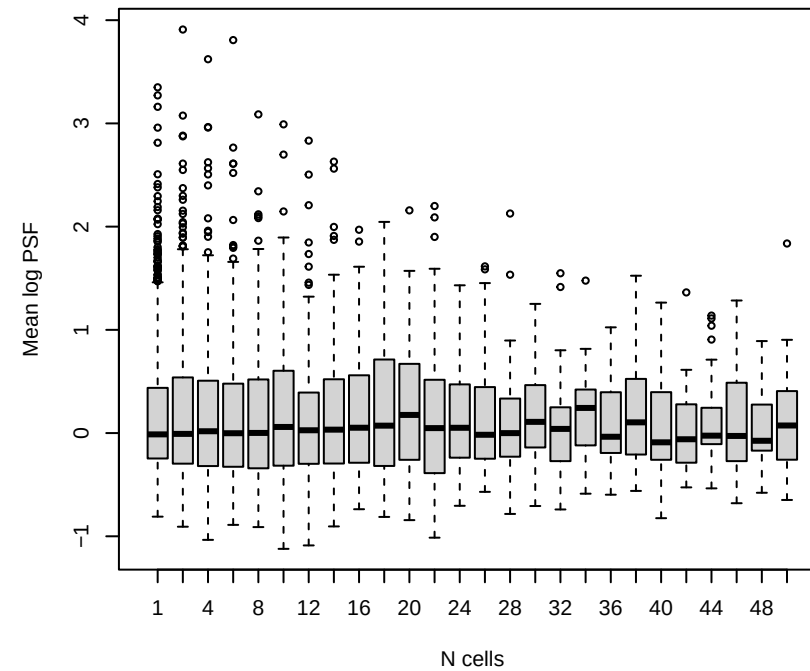
mTOR signaling pathway_skeletalmuscle



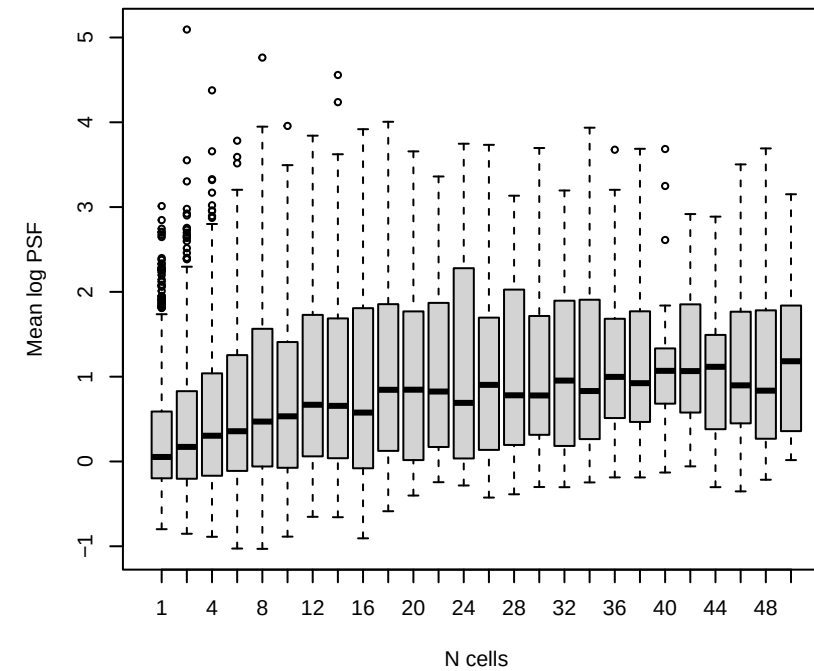
mTOR signaling pathway_esophagumucosa



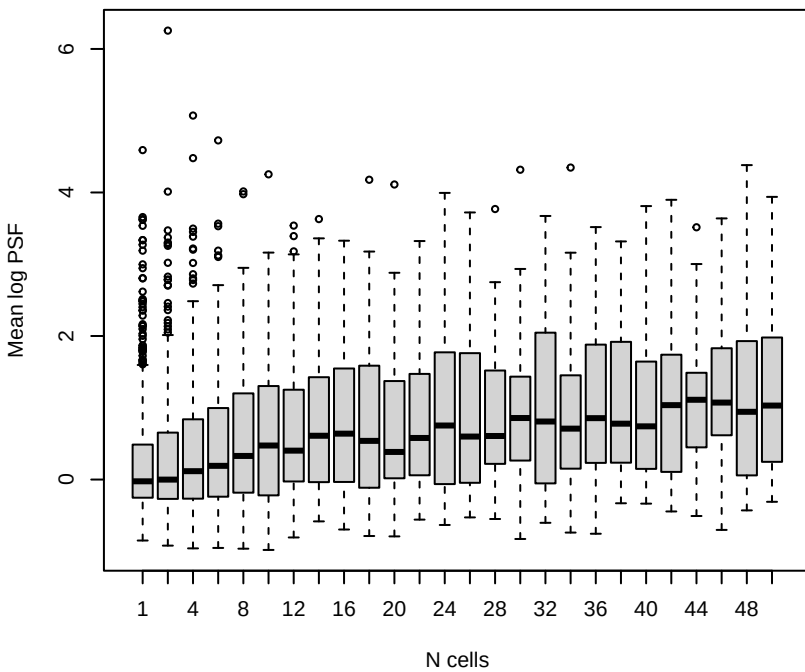
mTOR signaling pathway_heart



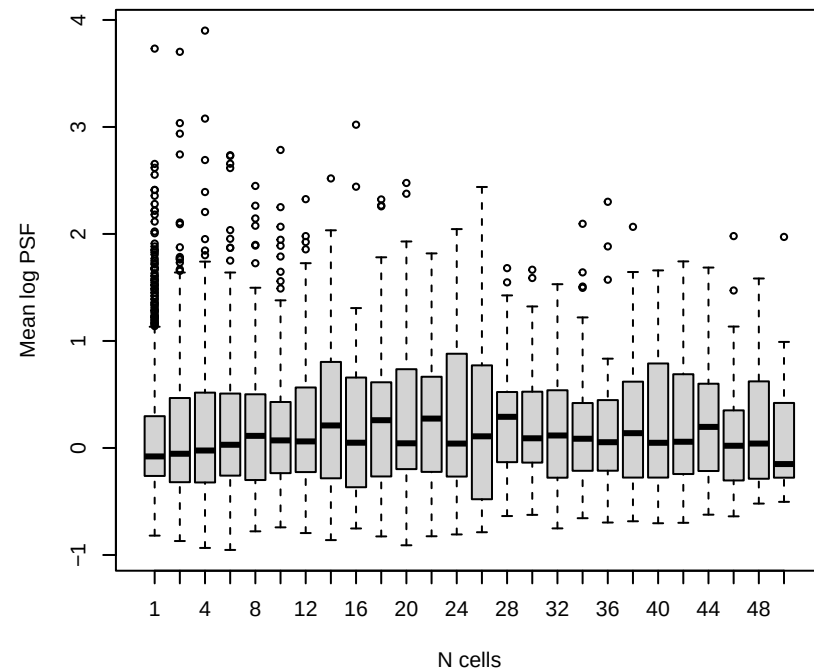
mTOR signaling pathway_prostate



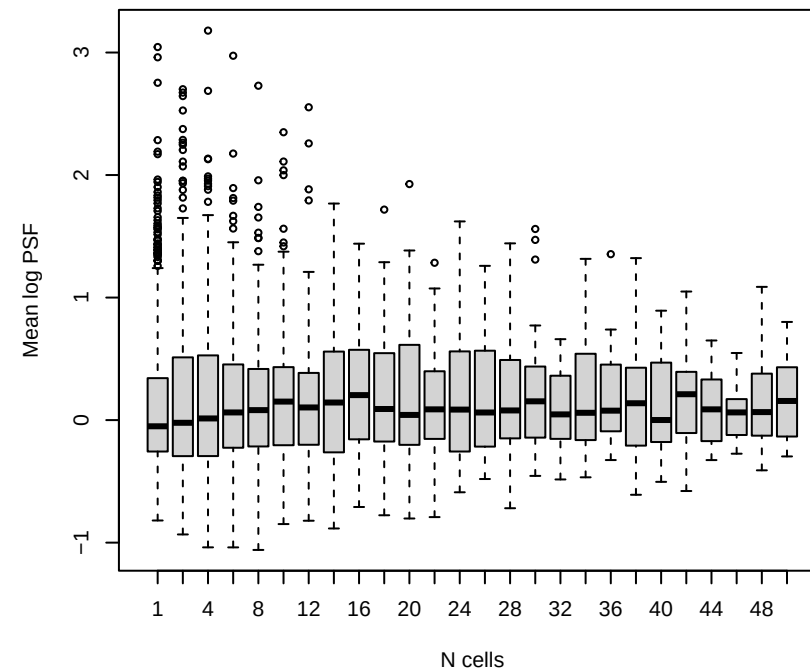
mTOR signaling pathway_breast



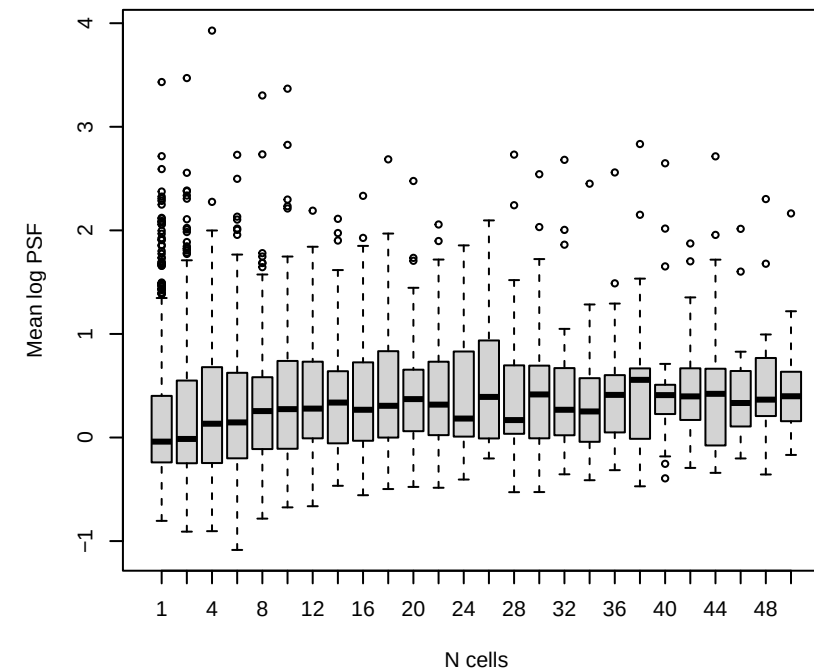
mTOR signaling pathway_esophagusmuscularis



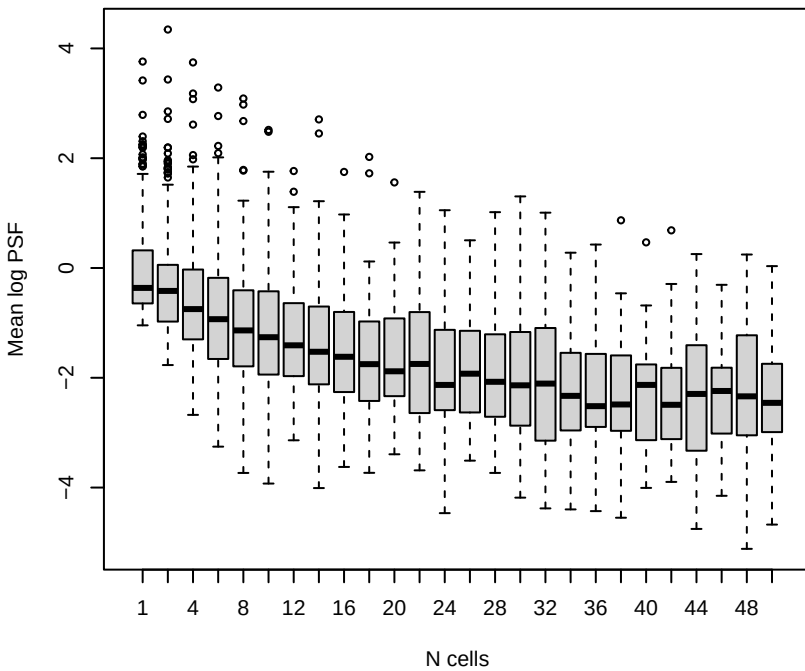
mTOR signaling pathway_lung



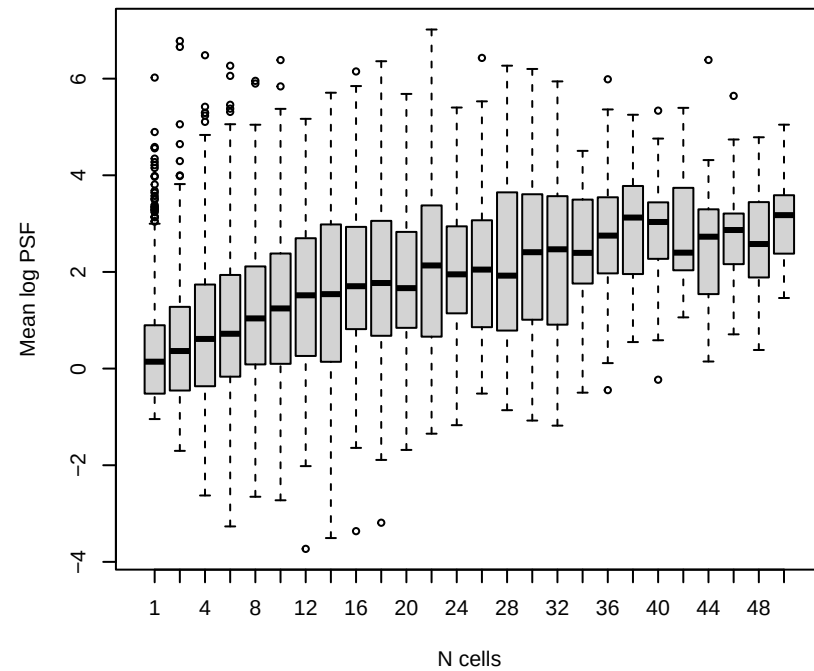
mTOR signaling pathway_skin



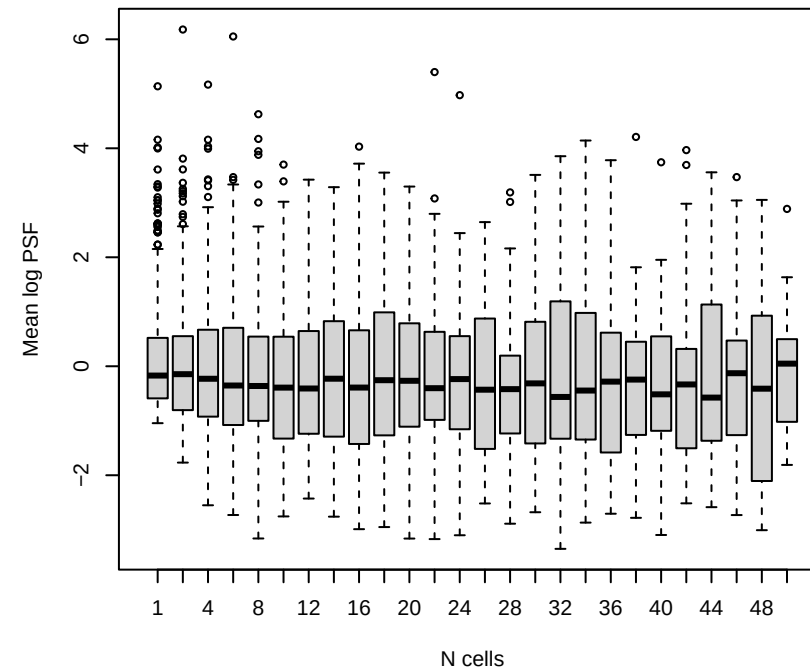
NF-kappa B signaling pathway_skeletalmuscle



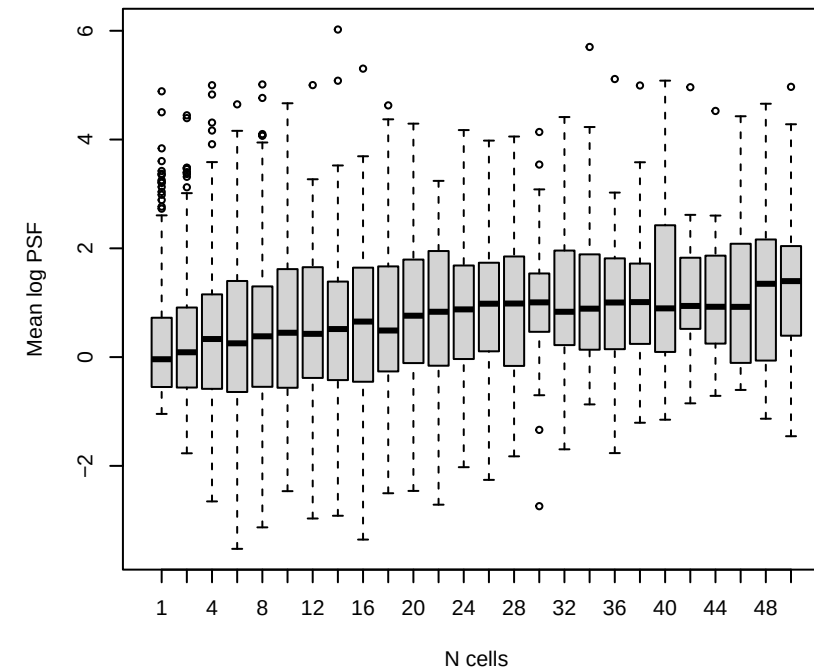
NF-kappa B signaling pathway_esophagasmucosa



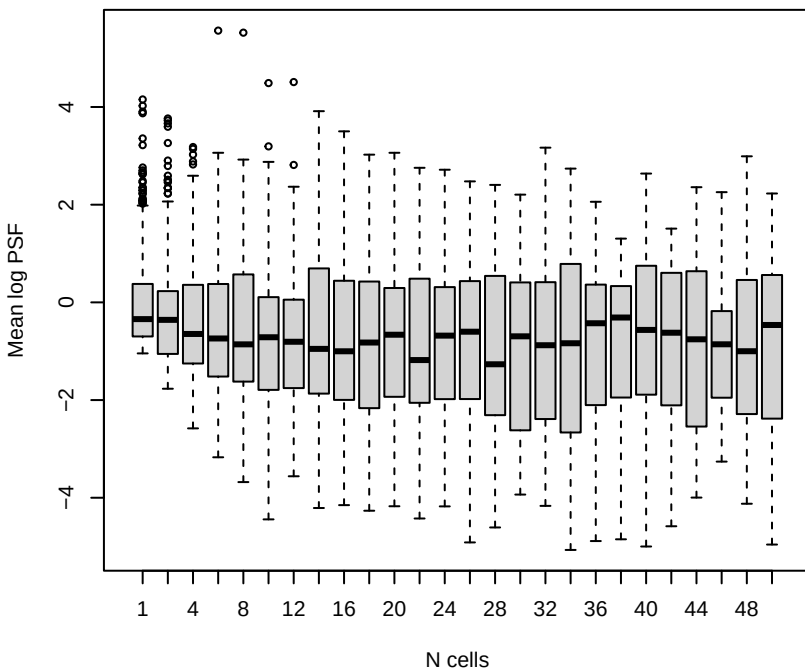
NF-kappa B signaling pathway_heart



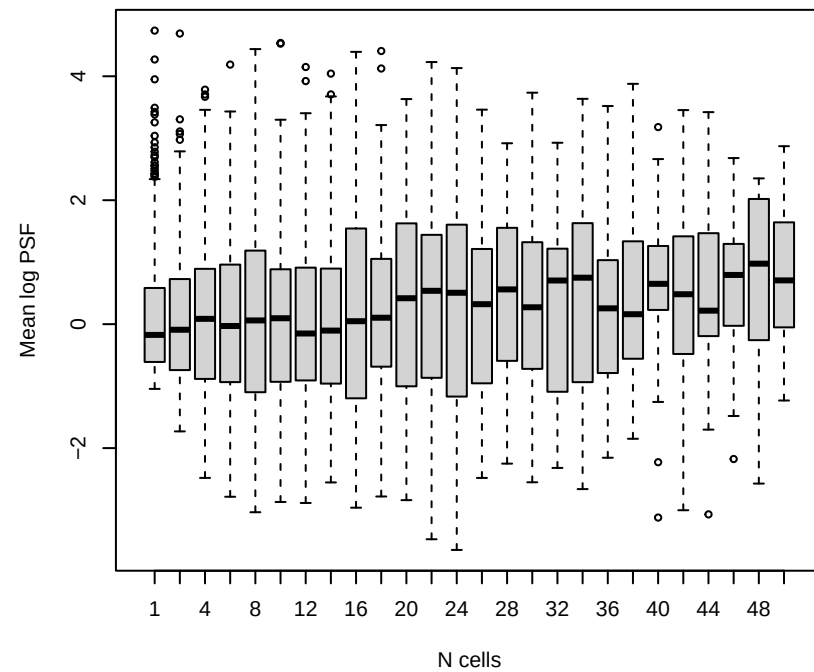
NF-kappa B signaling pathway_prostate



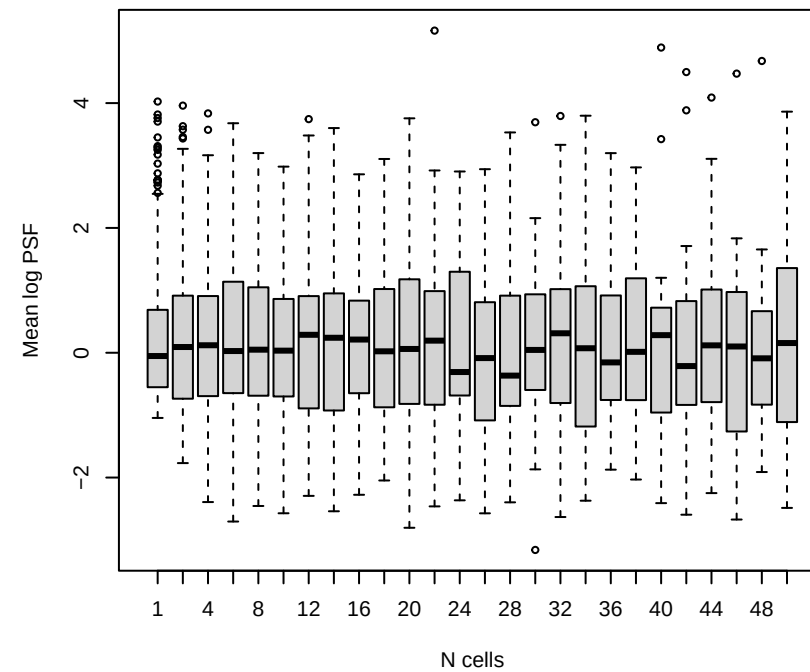
NF-kappa B signaling pathway_breast



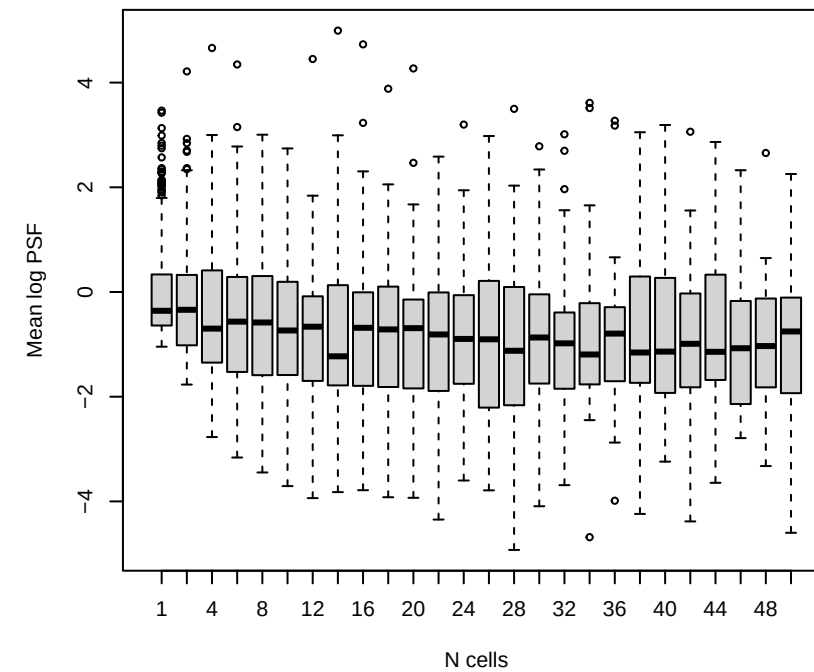
NF-kappa B signaling pathway_esophagusmuscularis



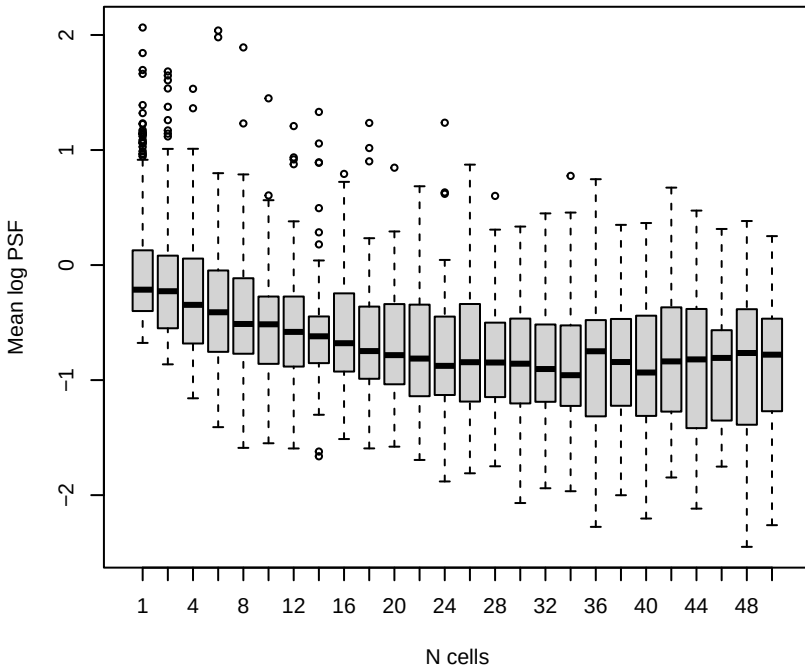
NF-kappa B signaling pathway_lung



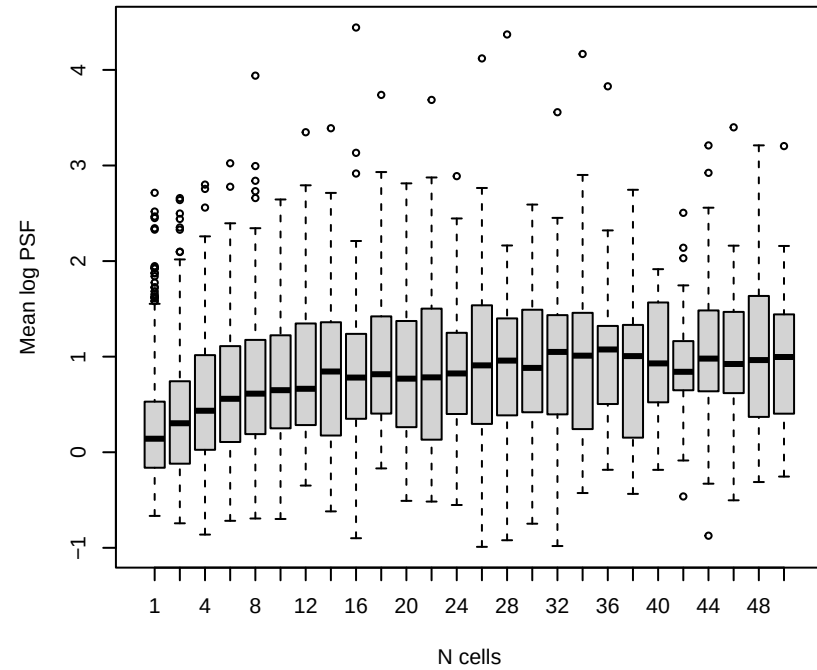
NF-kappa B signaling pathway_skin



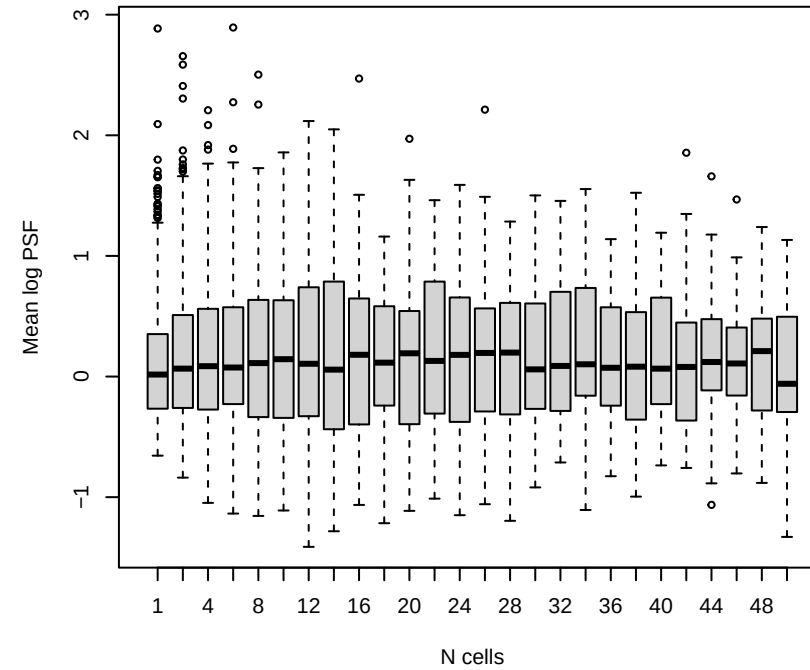
NOD-like receptor signaling pathway_skeletalmuscle



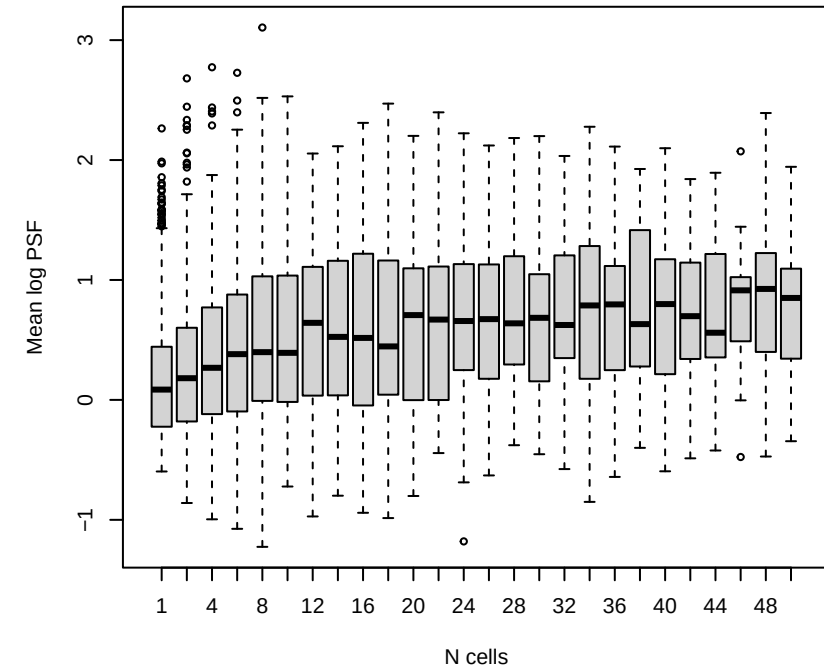
NOD-like receptor signaling pathway_esophagusmucosa



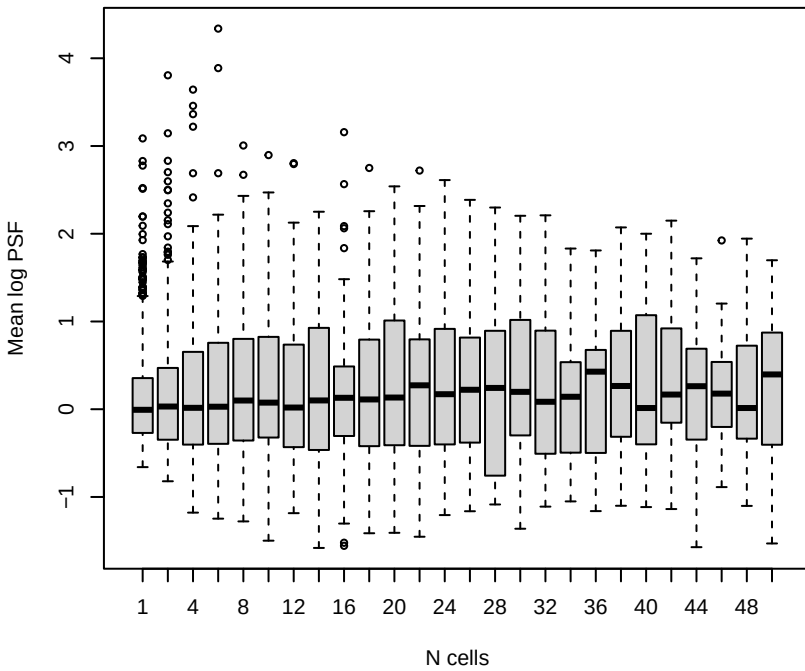
NOD-like receptor signaling pathway_heart



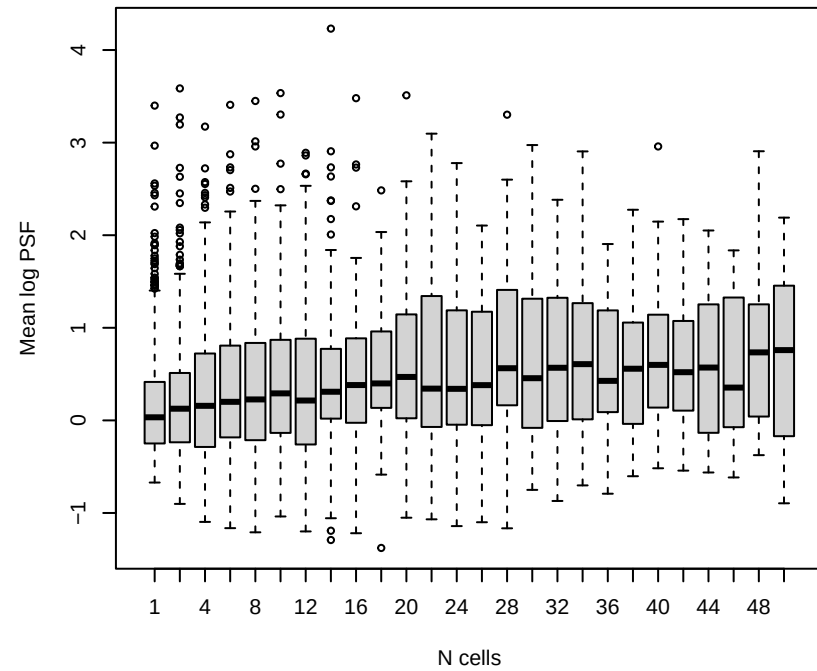
NOD-like receptor signaling pathway_prostate



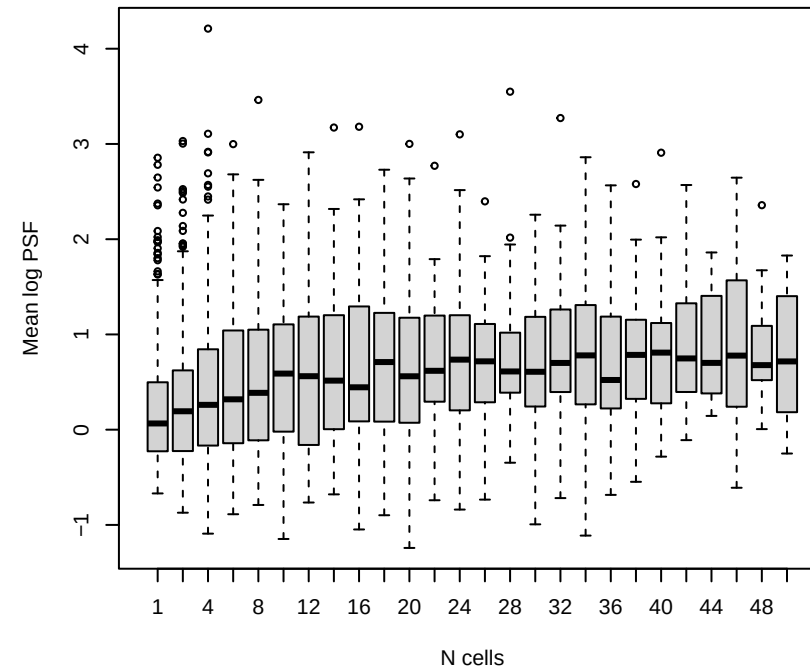
NOD-like receptor signaling pathway_breast



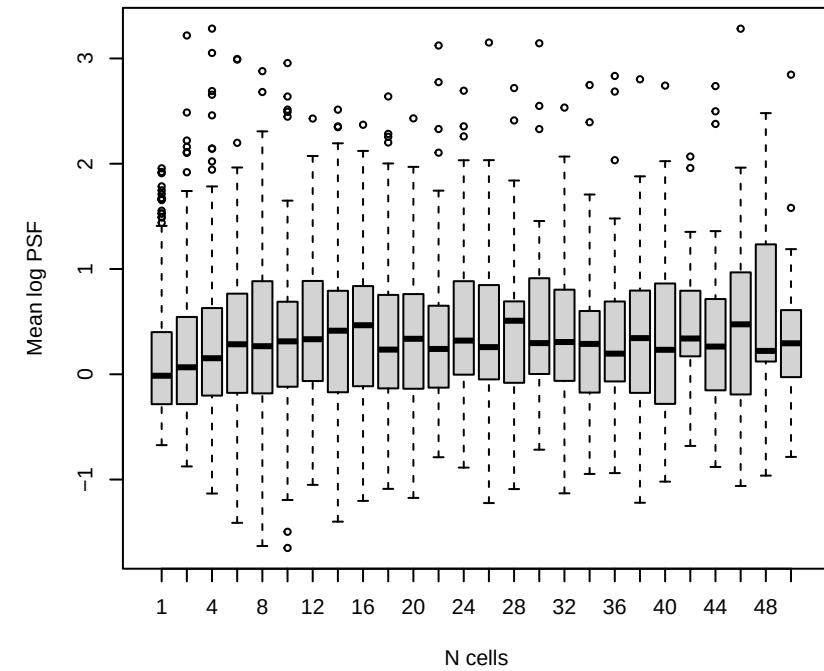
NOD-like receptor signaling pathway_esophagusmuscularis



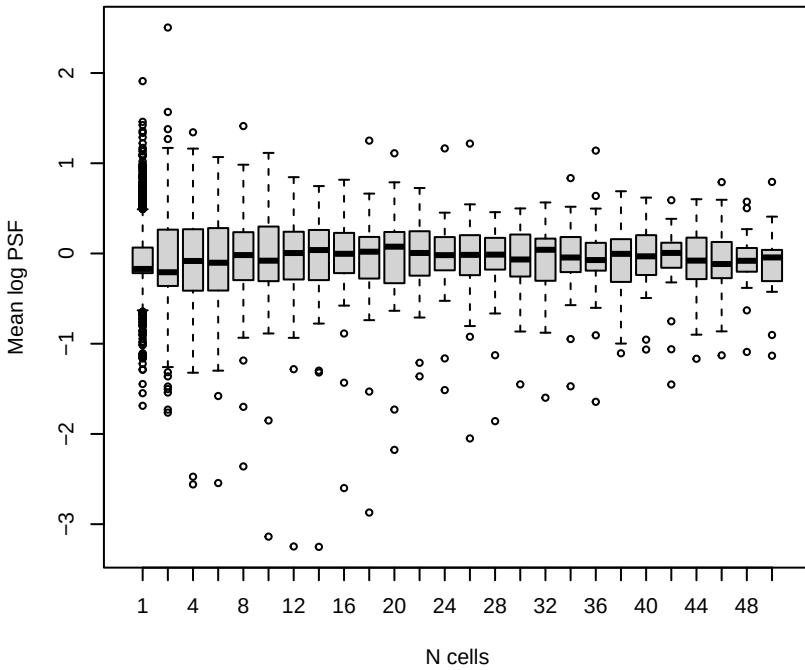
NOD-like receptor signaling pathway_lung



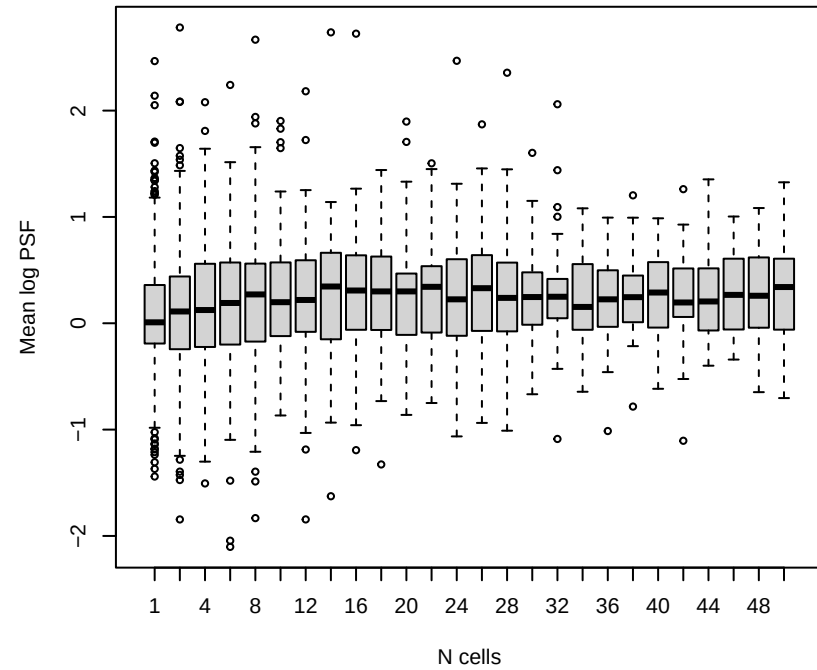
NOD-like receptor signaling pathway_skin



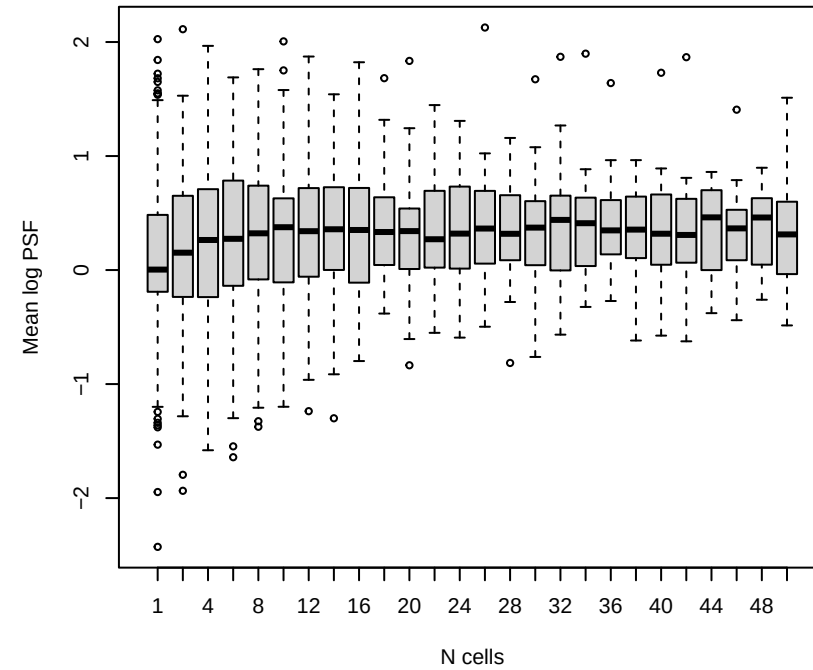
Notch signaling pathway_skeletalmuscle



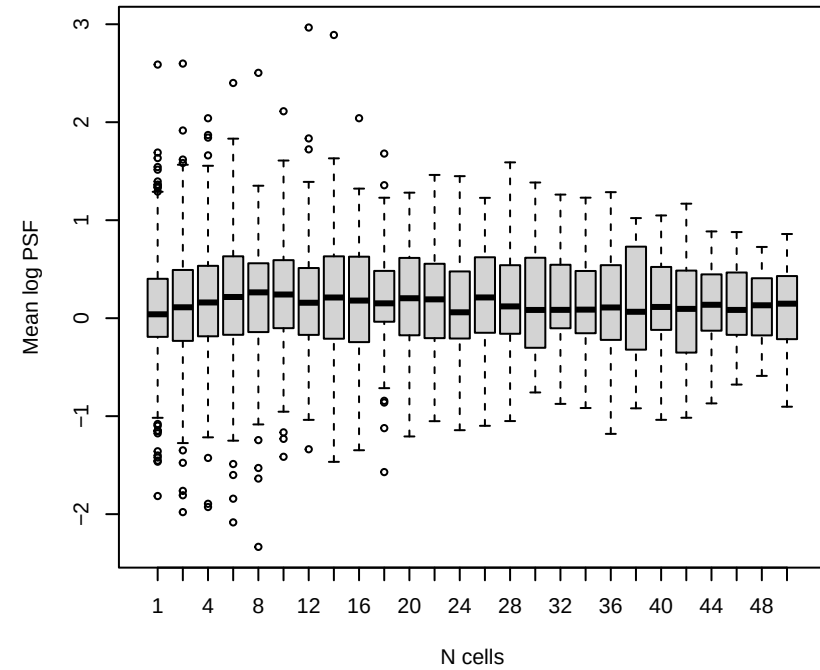
Notch signaling pathway_esophagasmucosa



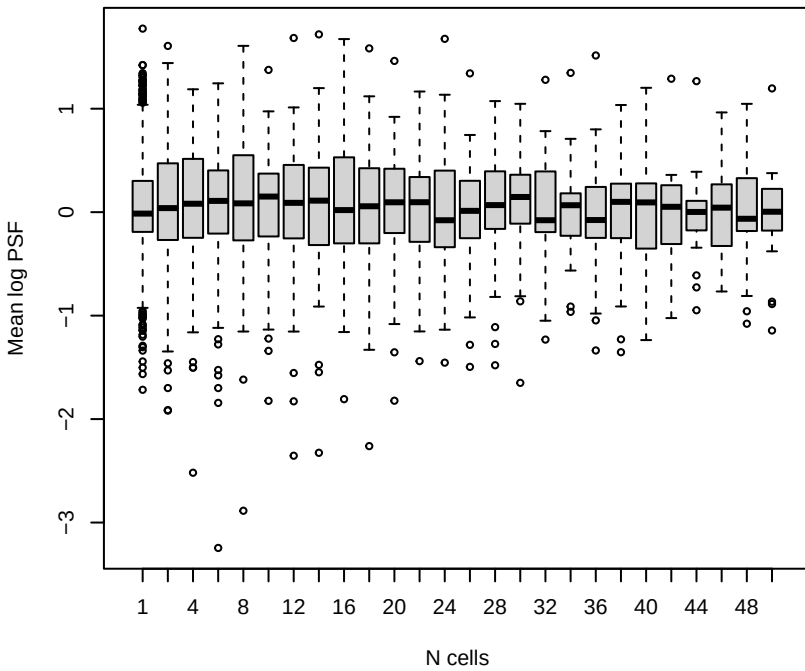
Notch signaling pathway_heart



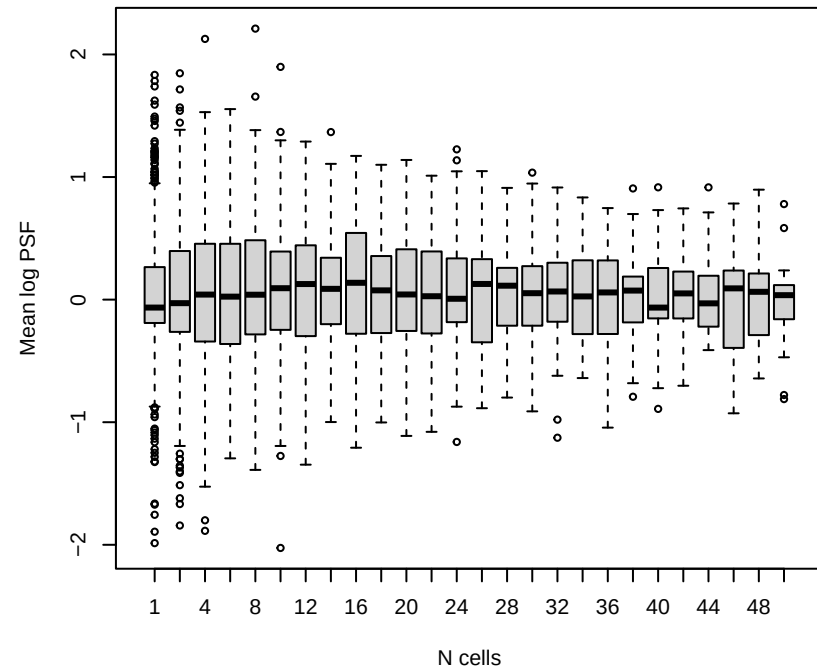
Notch signaling pathway_prostate



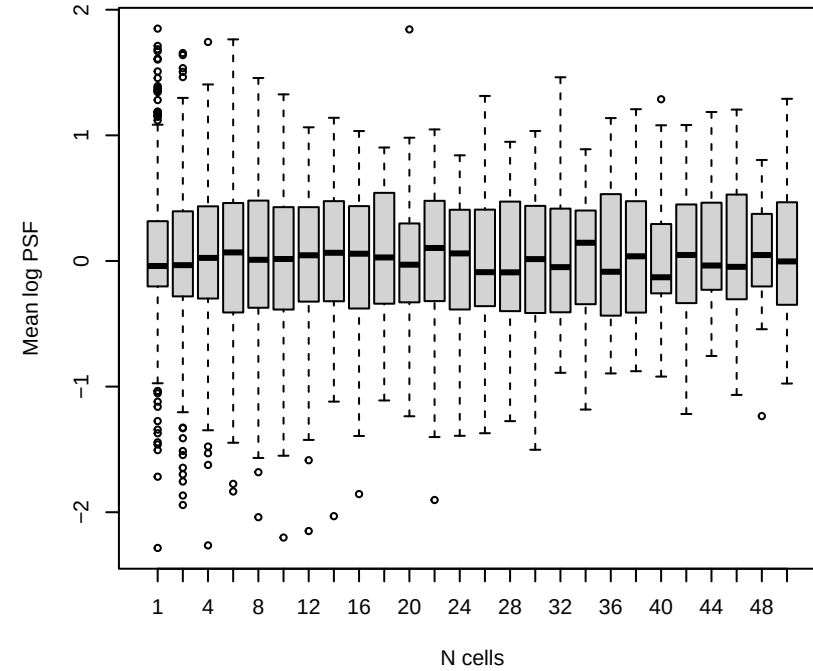
Notch signaling pathway_breast



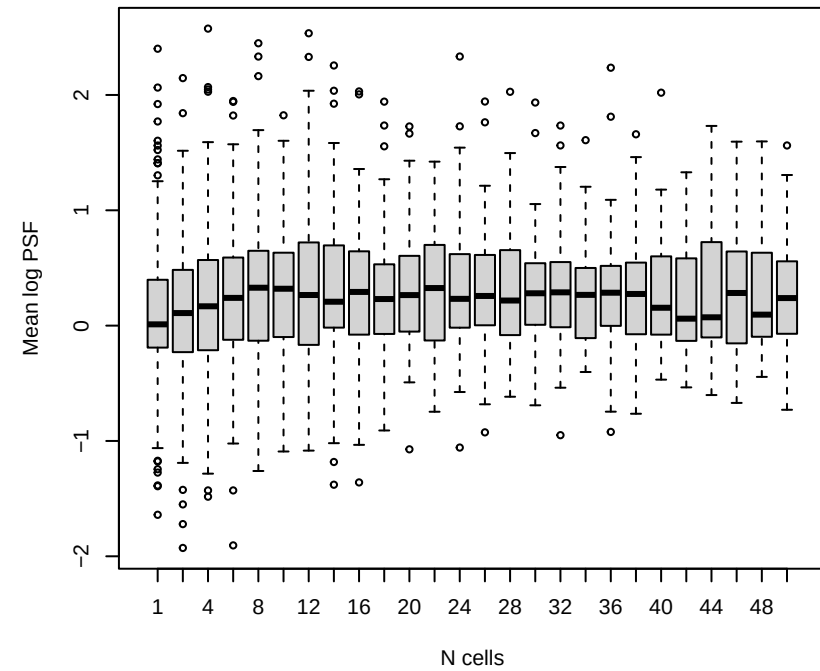
Notch signaling pathway_esophagusmuscularis

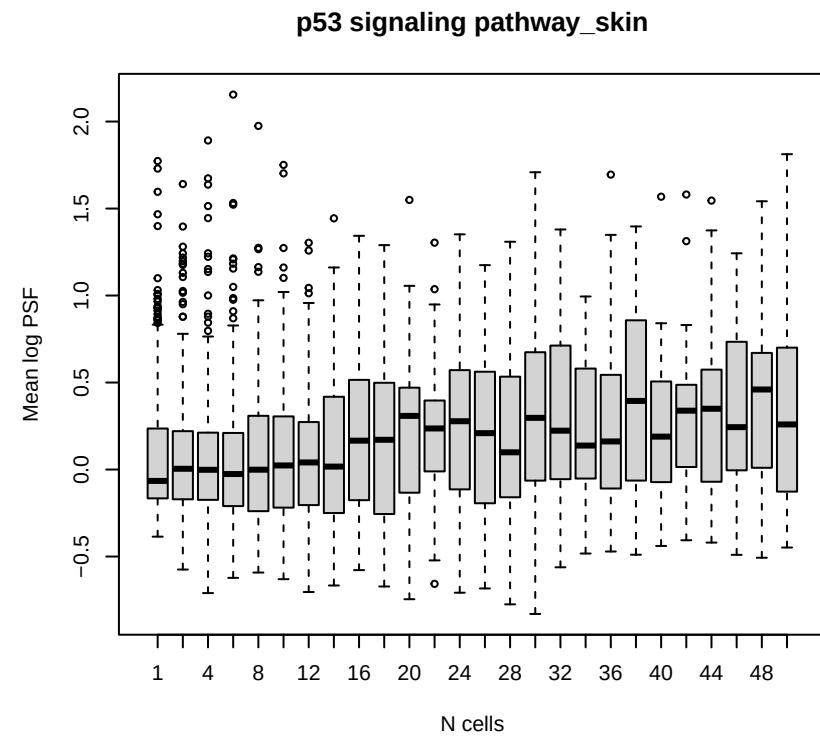
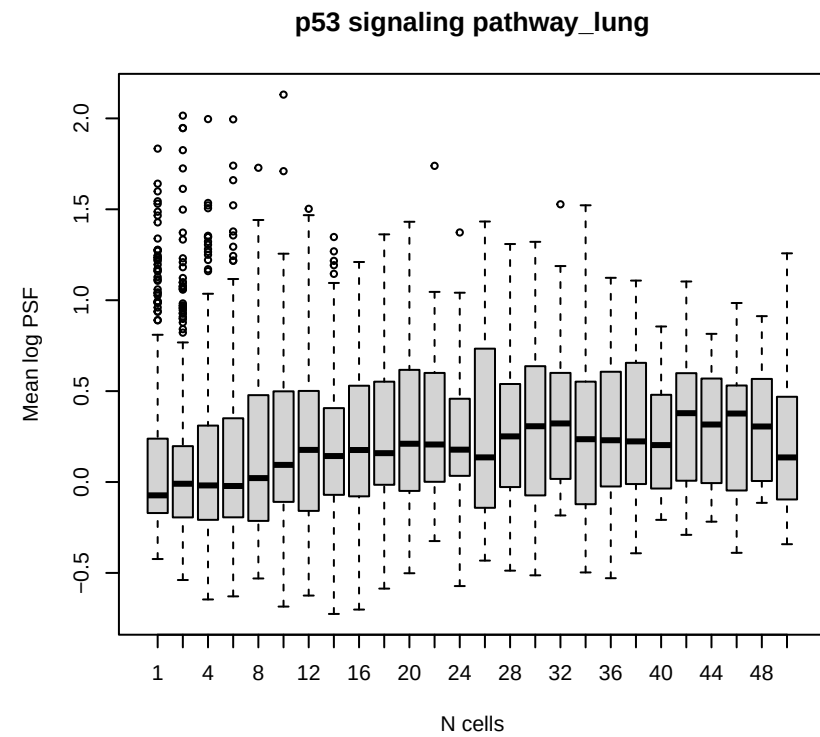
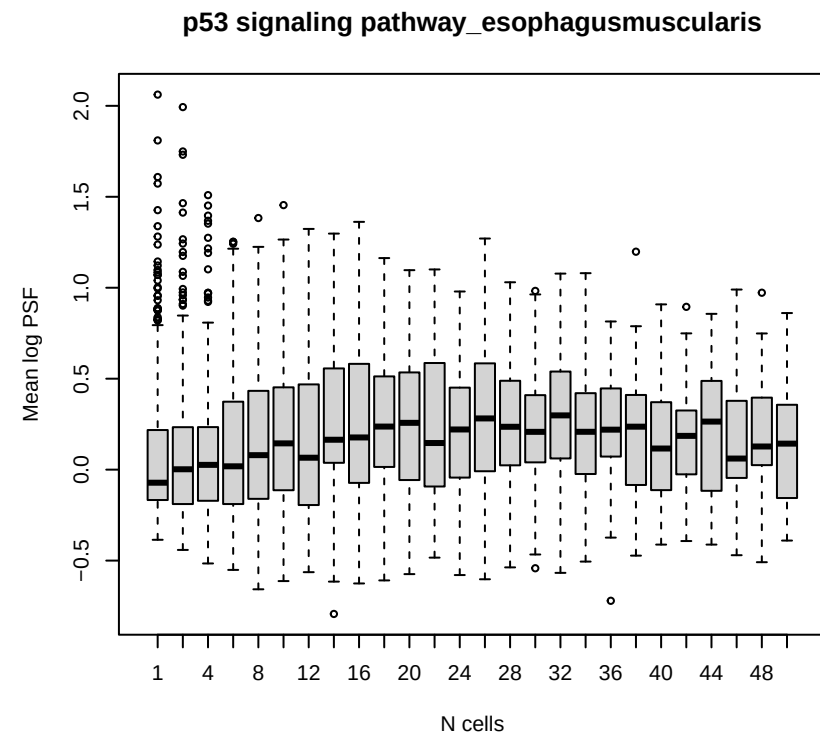
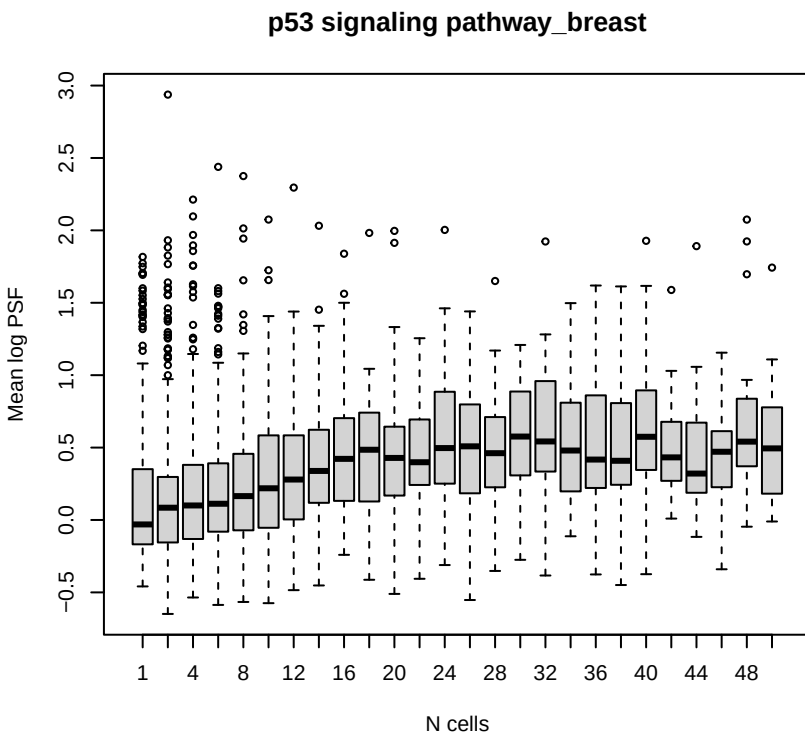
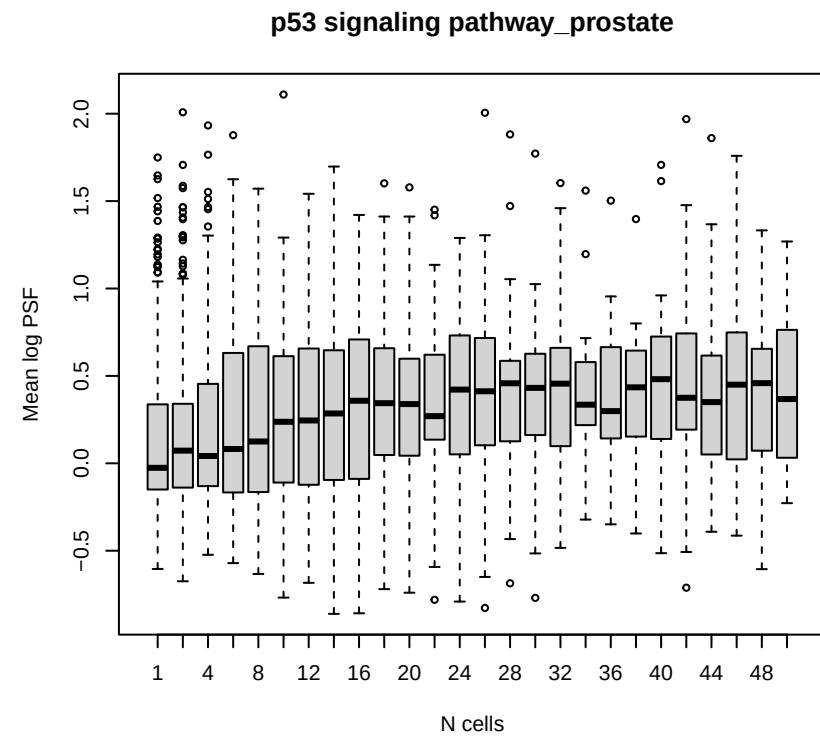
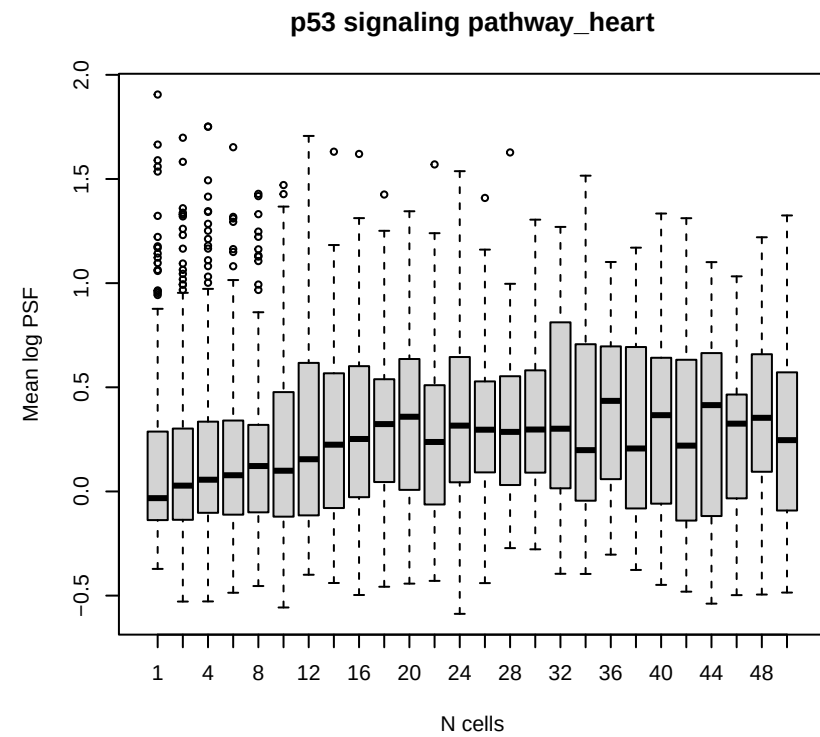
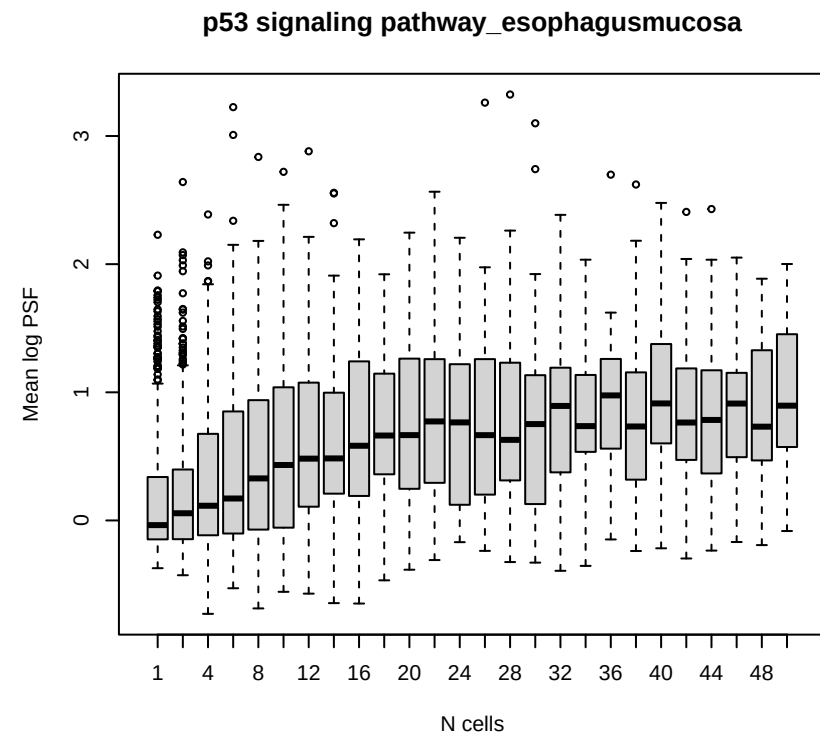
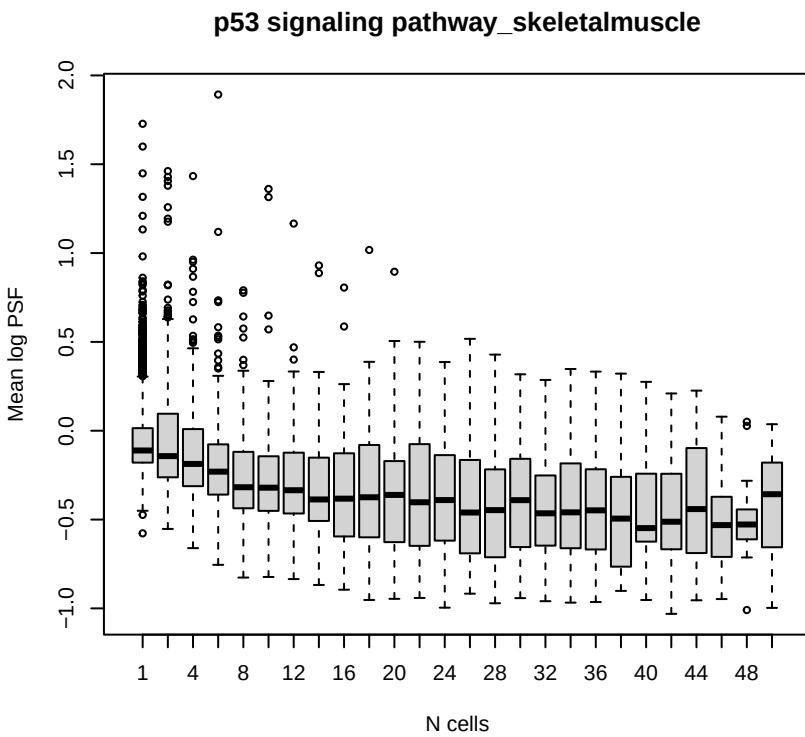


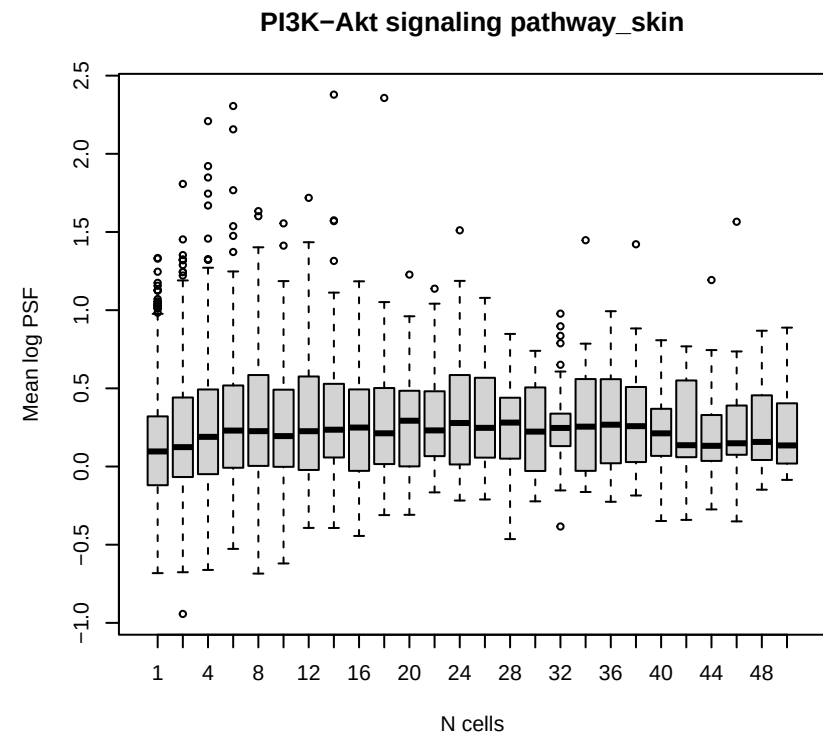
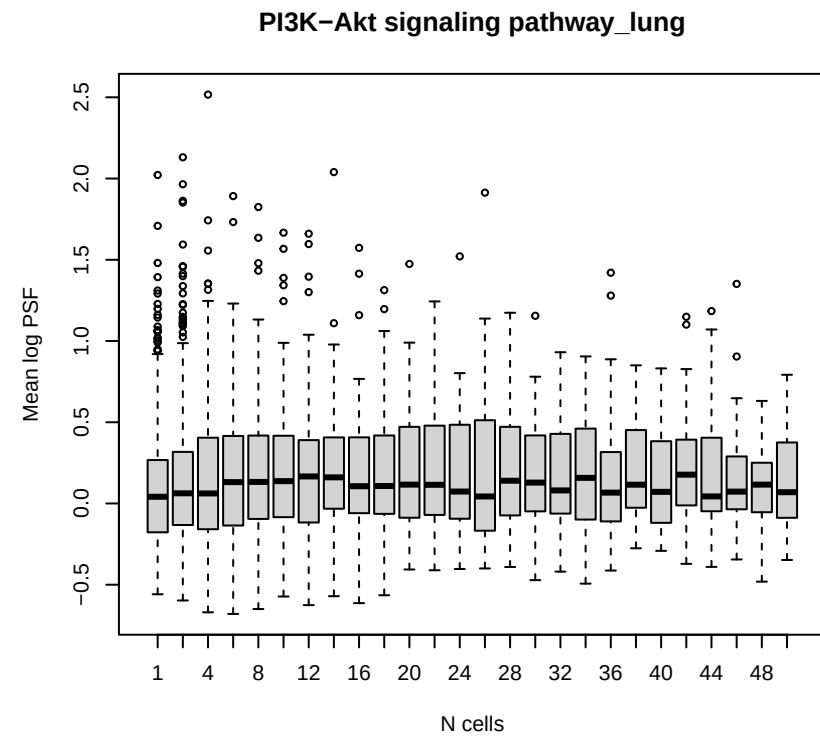
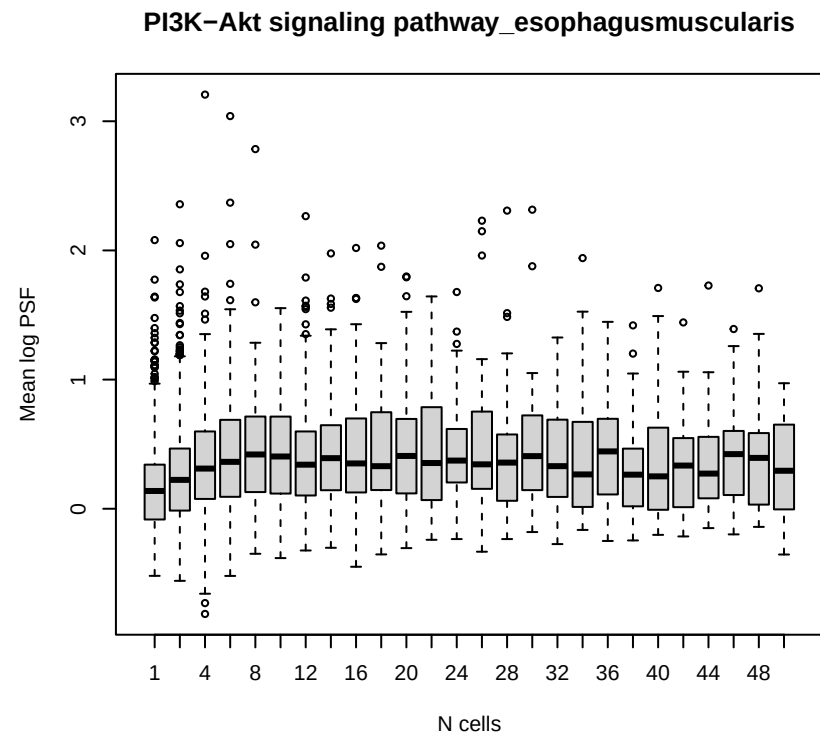
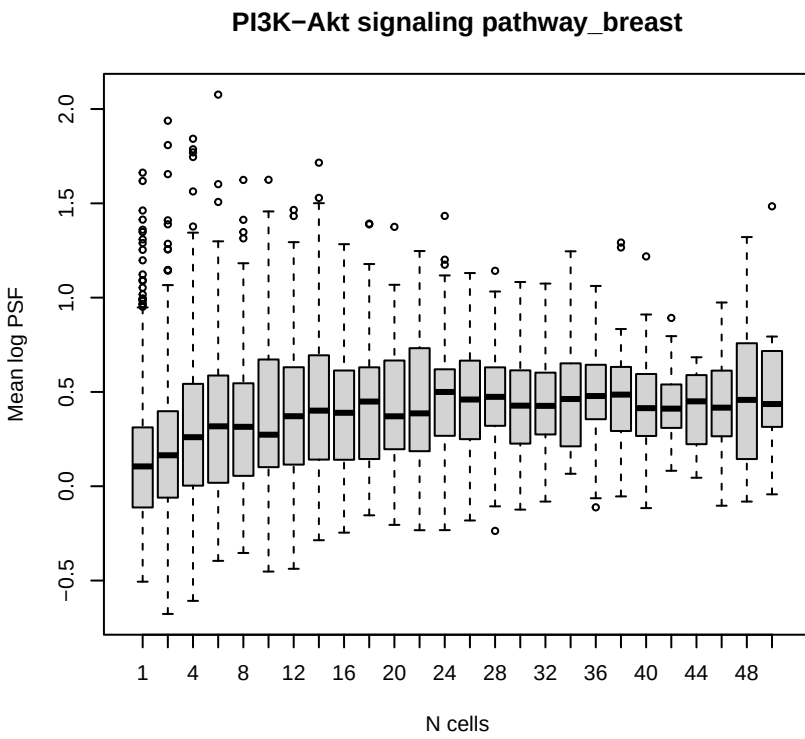
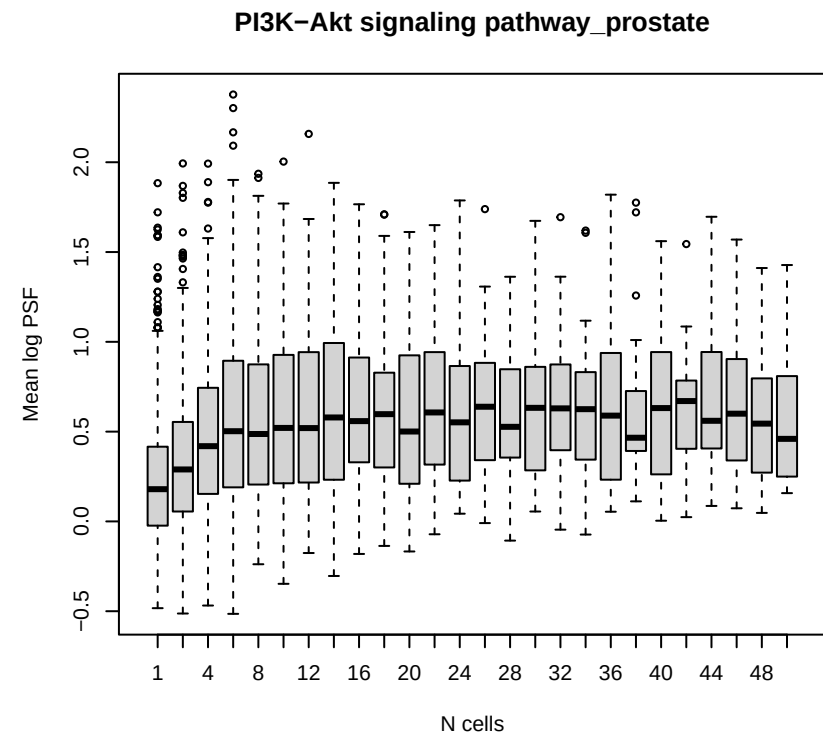
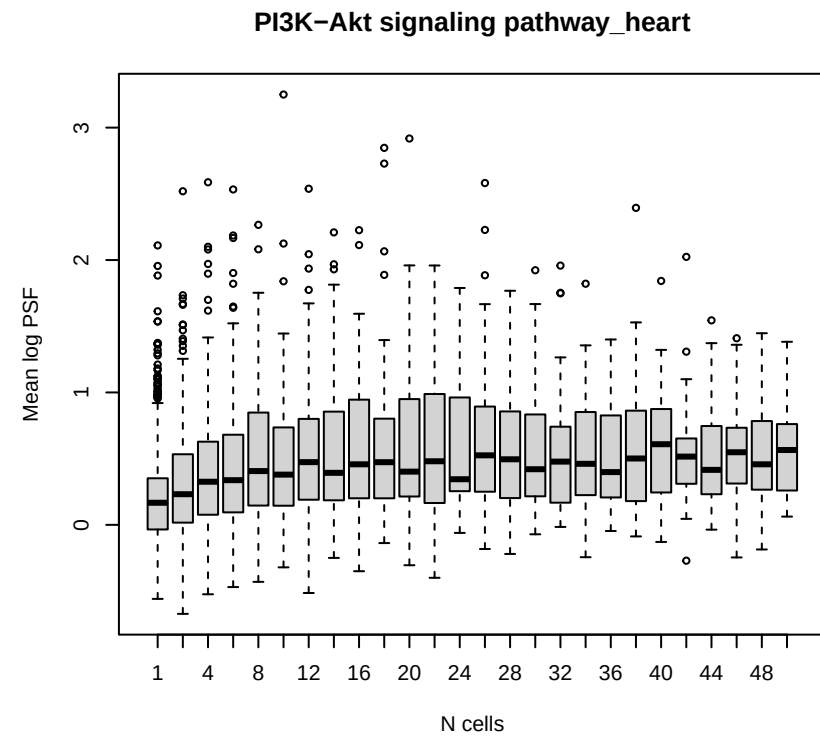
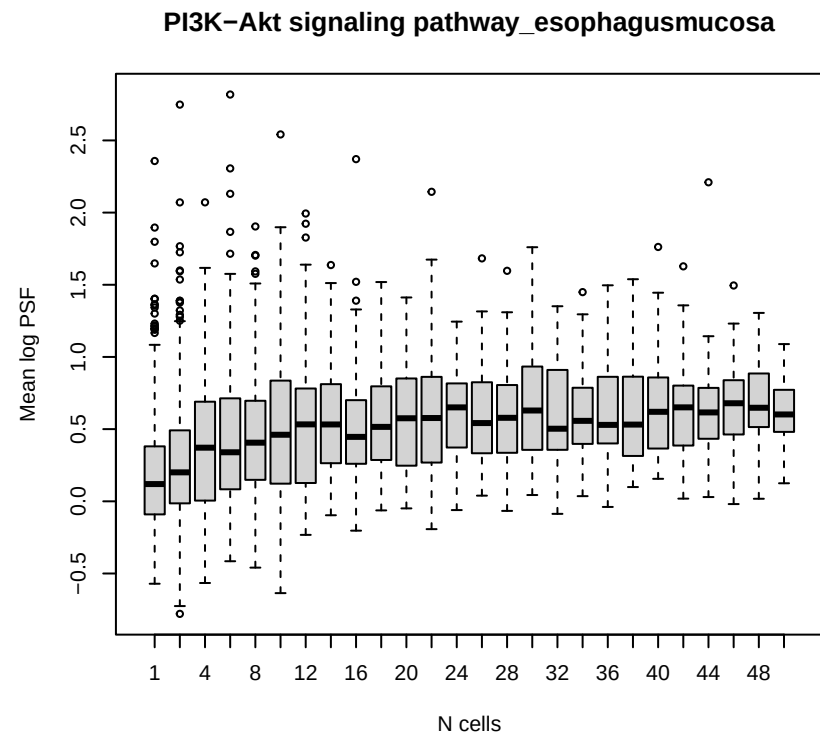
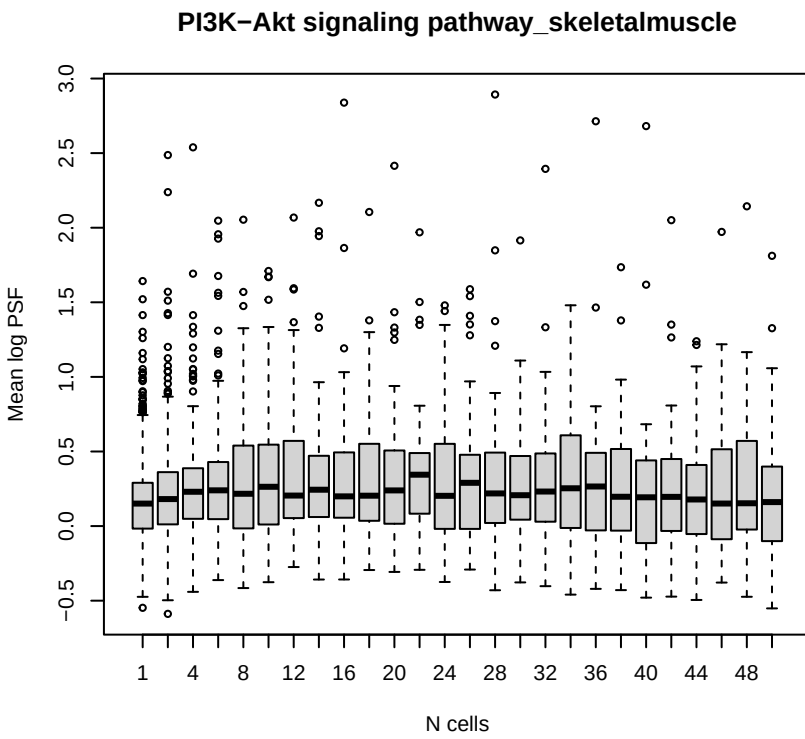
Notch signaling pathway_lung



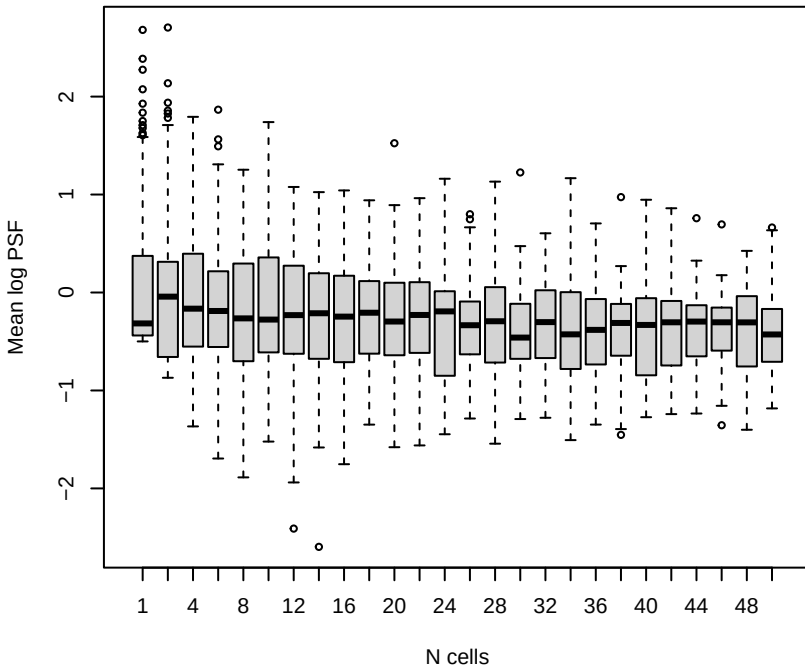
Notch signaling pathway_skin



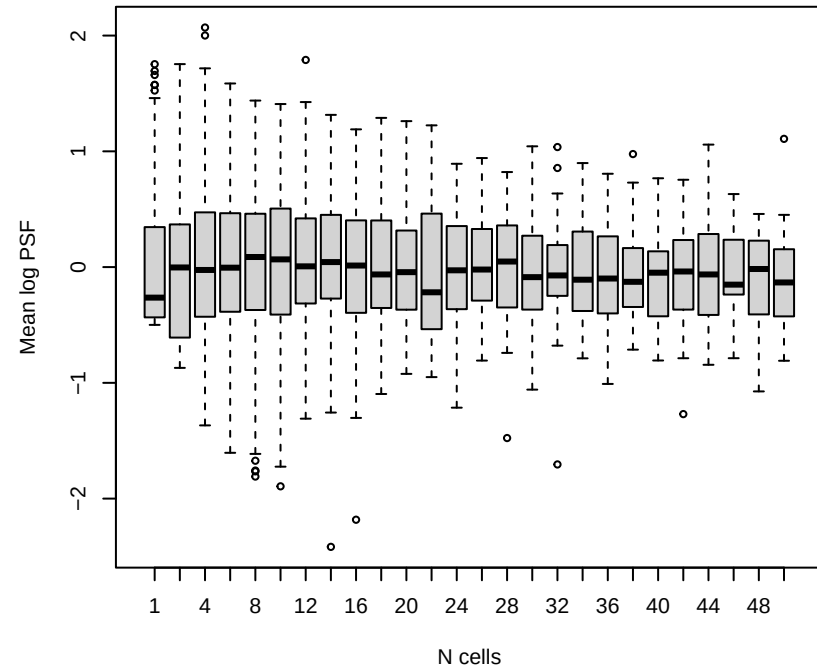




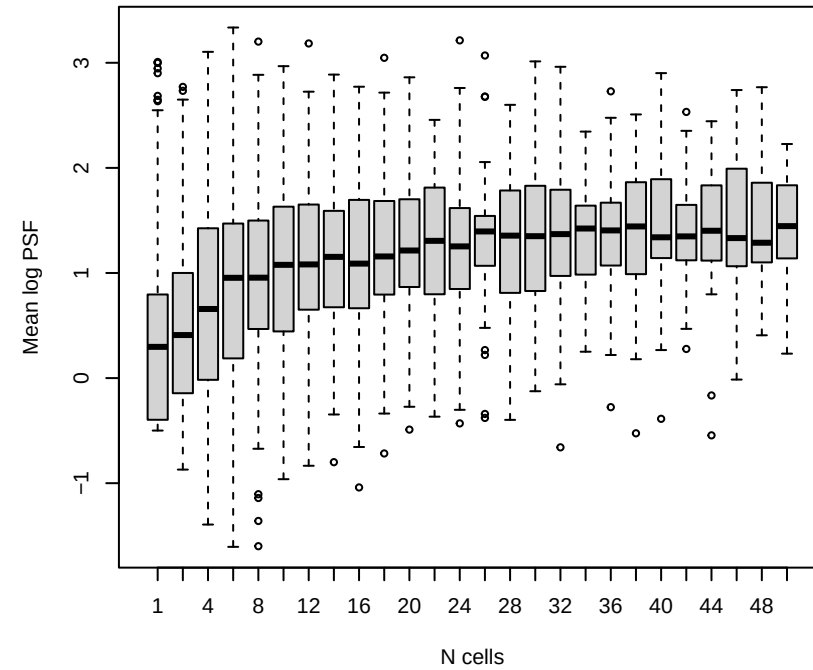
PPAR signaling pathway_skeletalmuscle



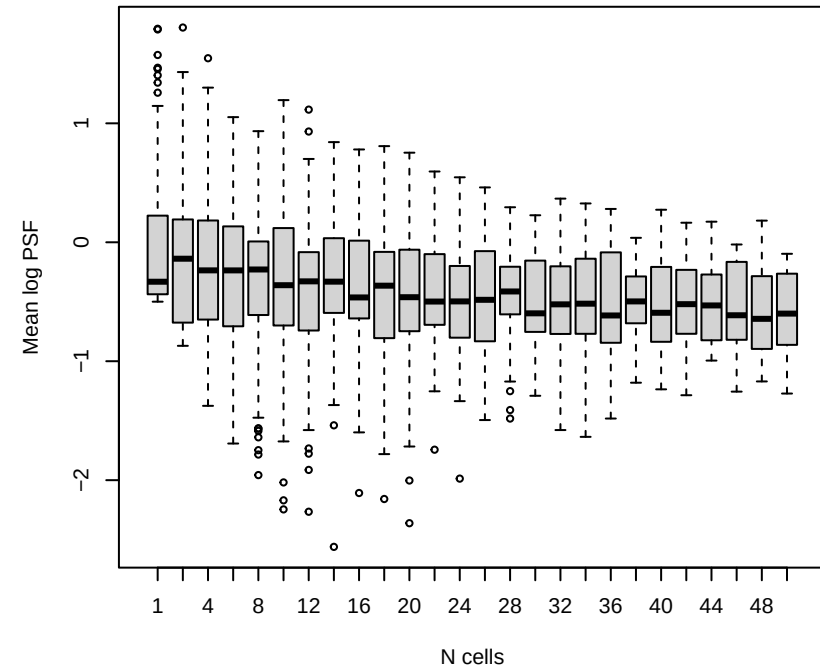
PPAR signaling pathway_esophagasmucosa



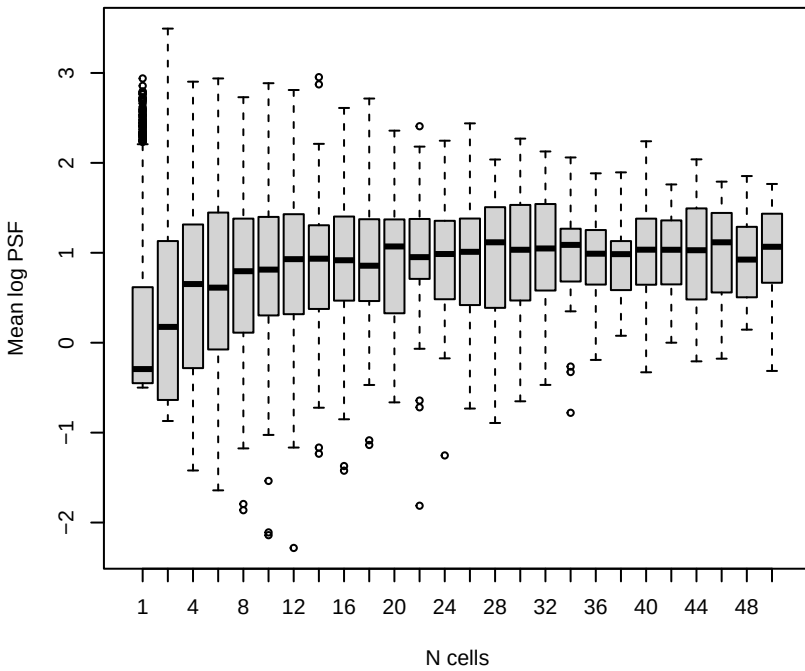
PPAR signaling pathway_heart



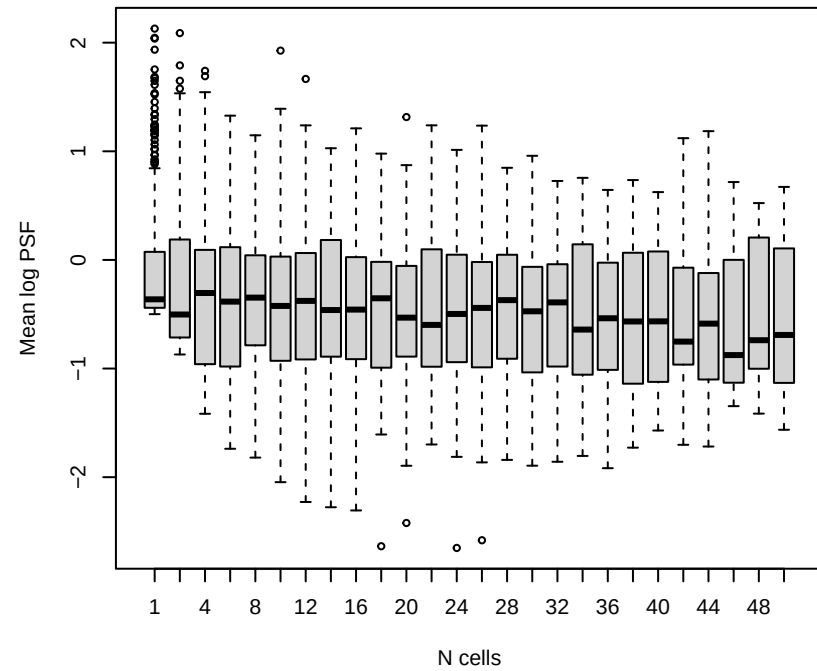
PPAR signaling pathway_prostate



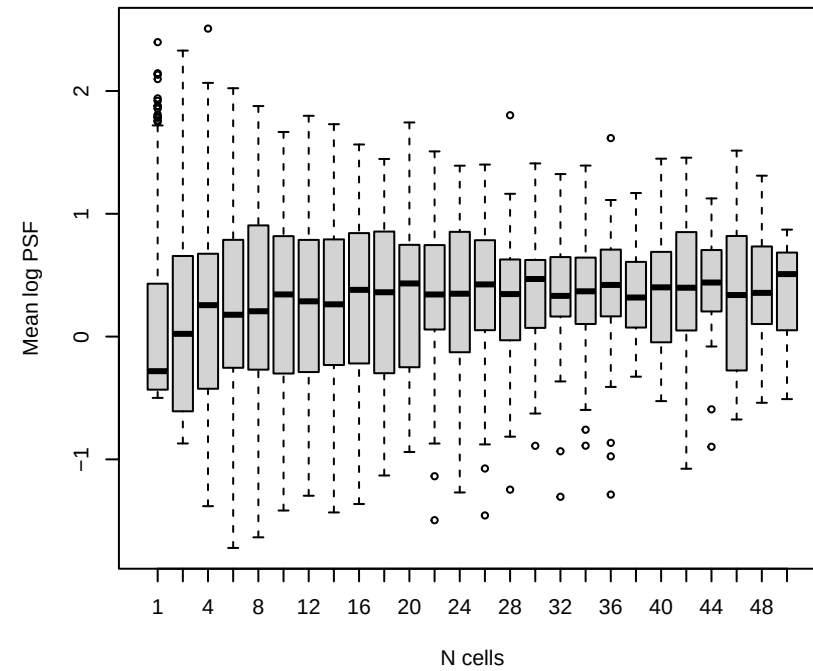
PPAR signaling pathway_breast



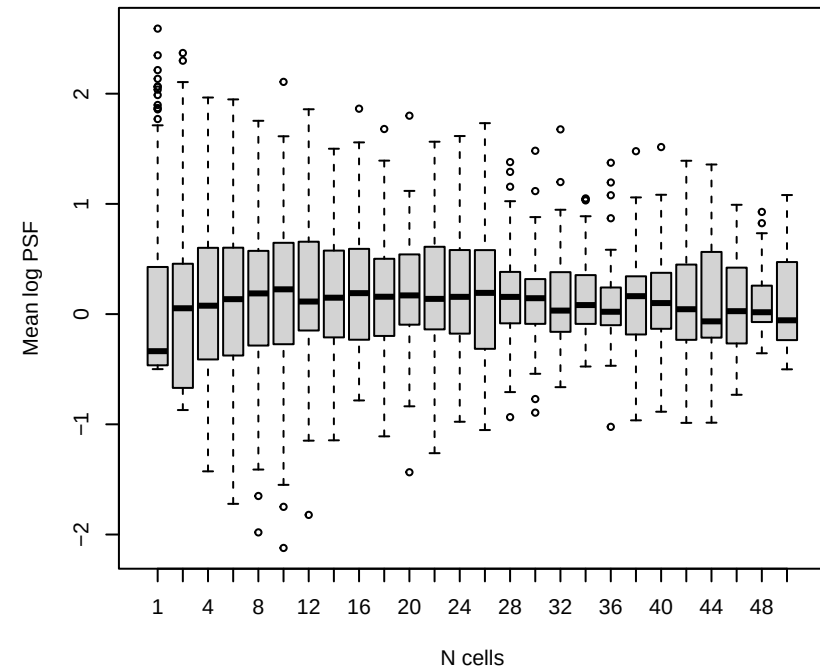
PPAR signaling pathway_esophagusmuscularis



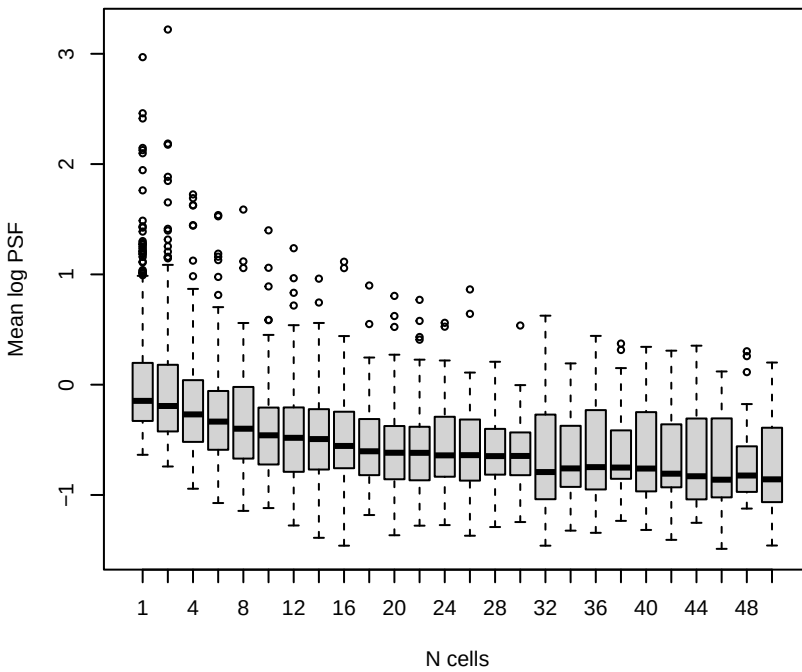
PPAR signaling pathway_lung



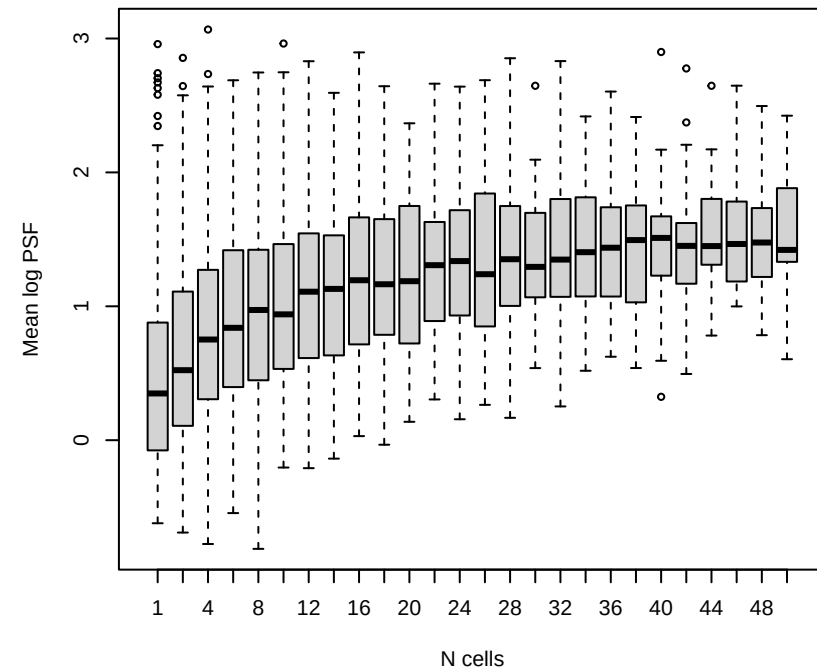
PPAR signaling pathway_skin



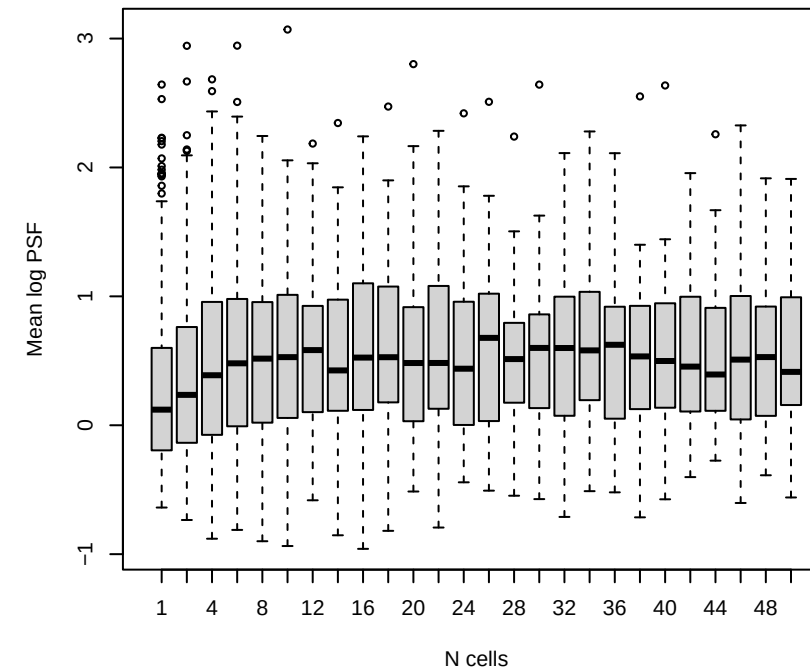
Rap1 signaling pathway_skeletalmuscle



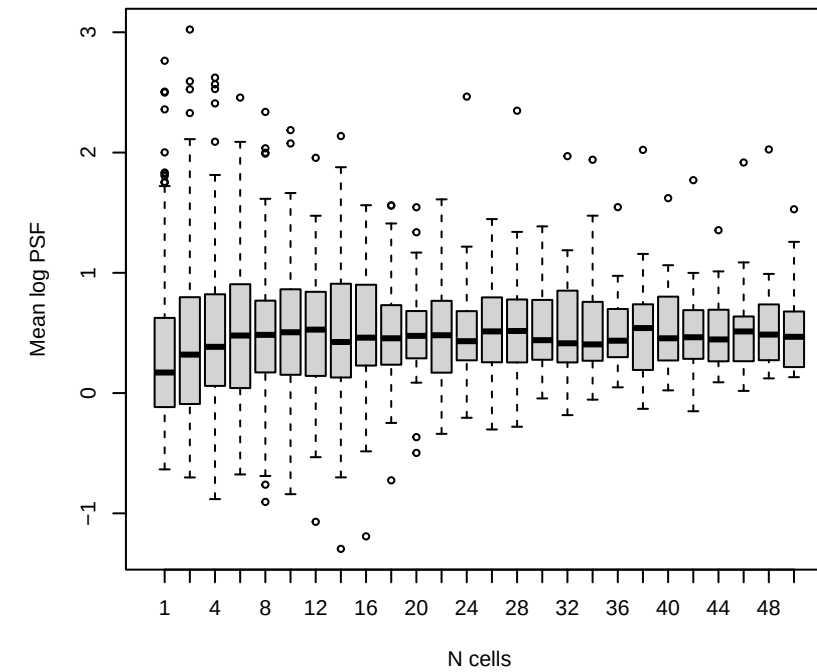
Rap1 signaling pathway_esophagusmucosa



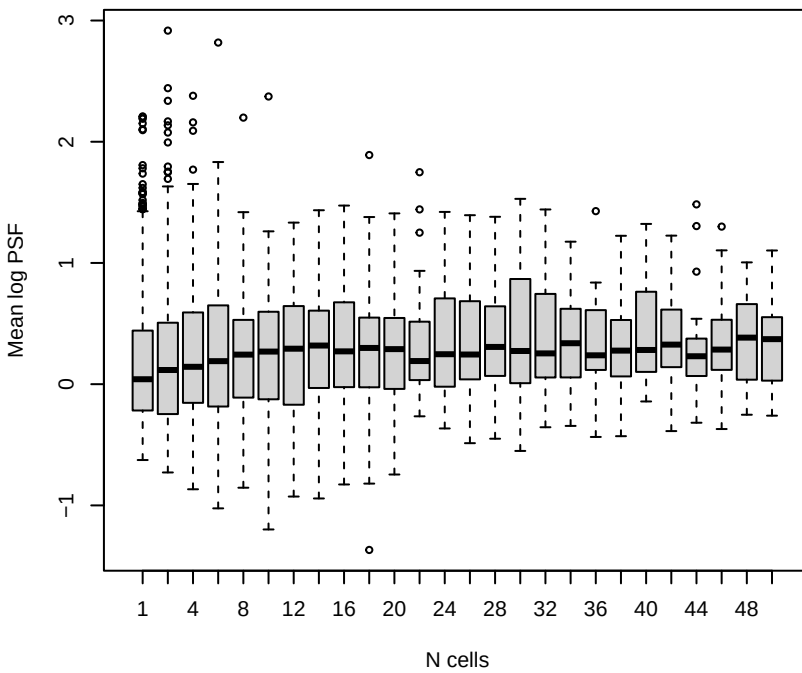
Rap1 signaling pathway_heart



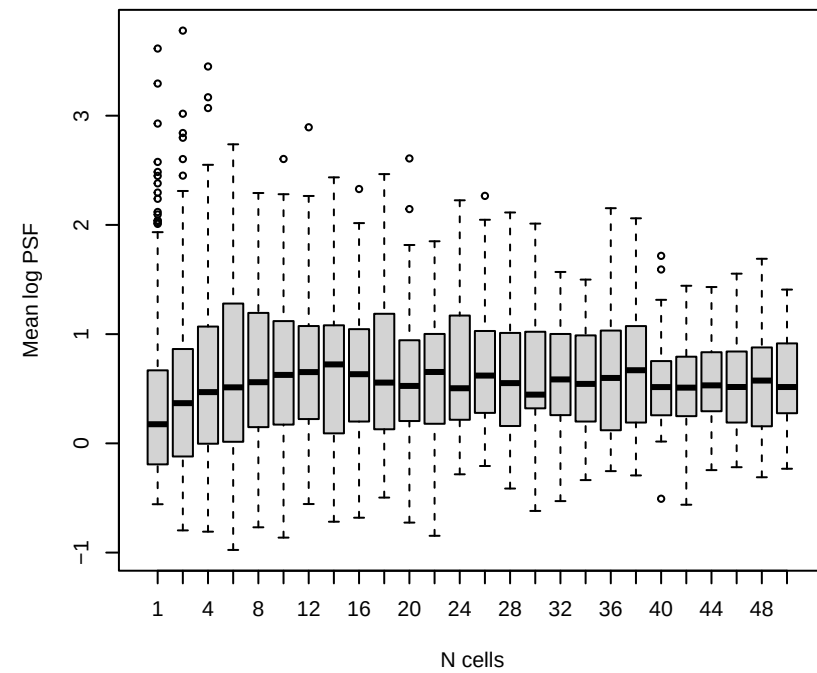
Rap1 signaling pathway_prostate



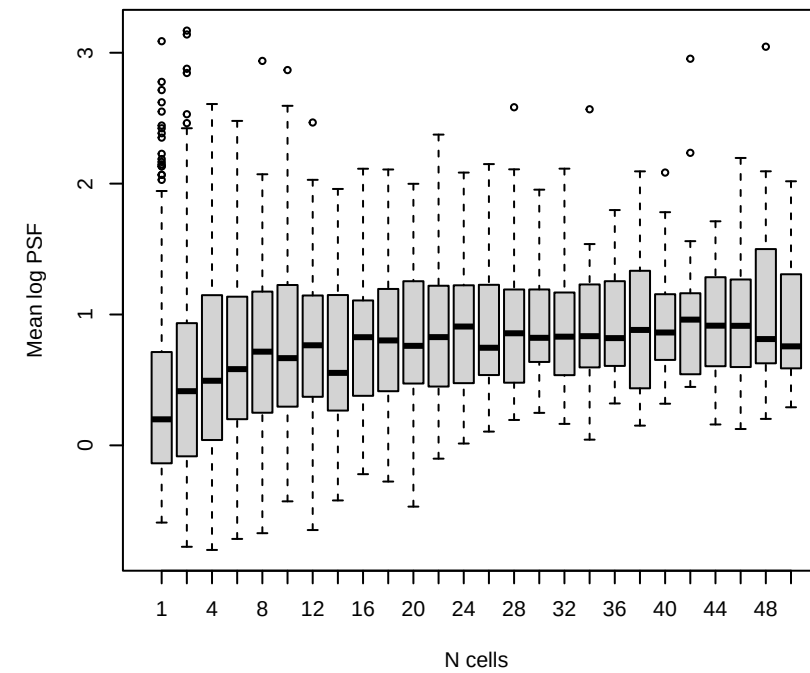
Rap1 signaling pathway_breast



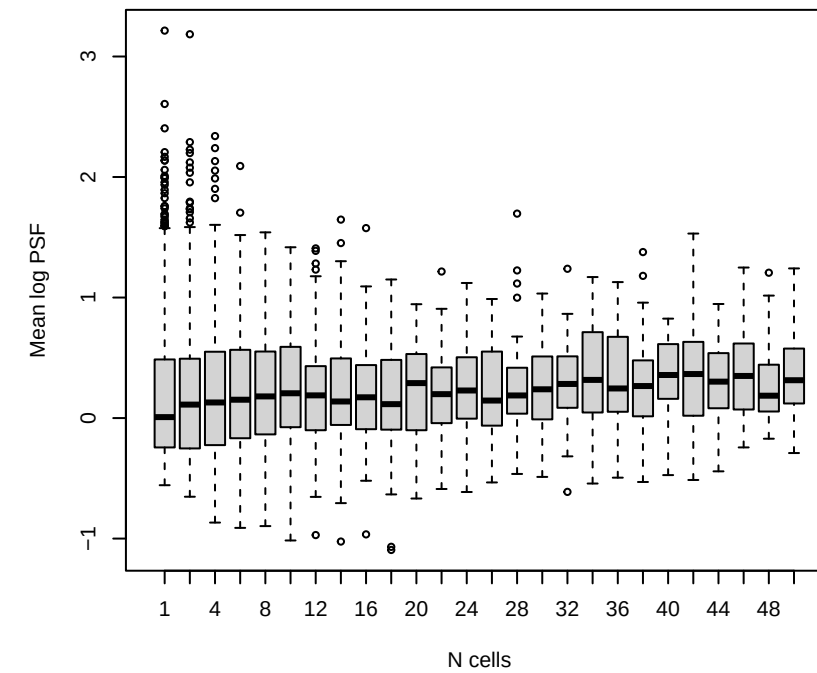
Rap1 signaling pathway_esophagusmuscularis

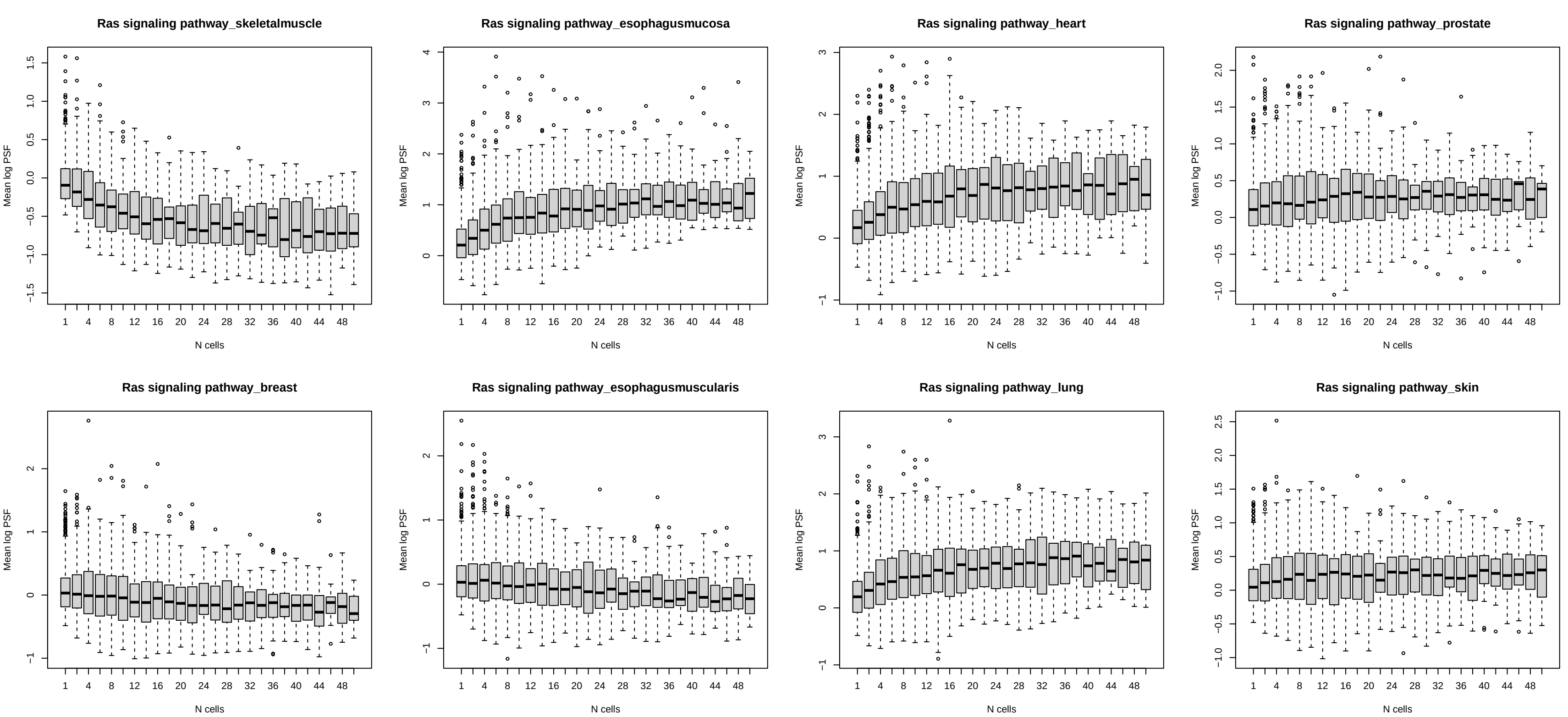


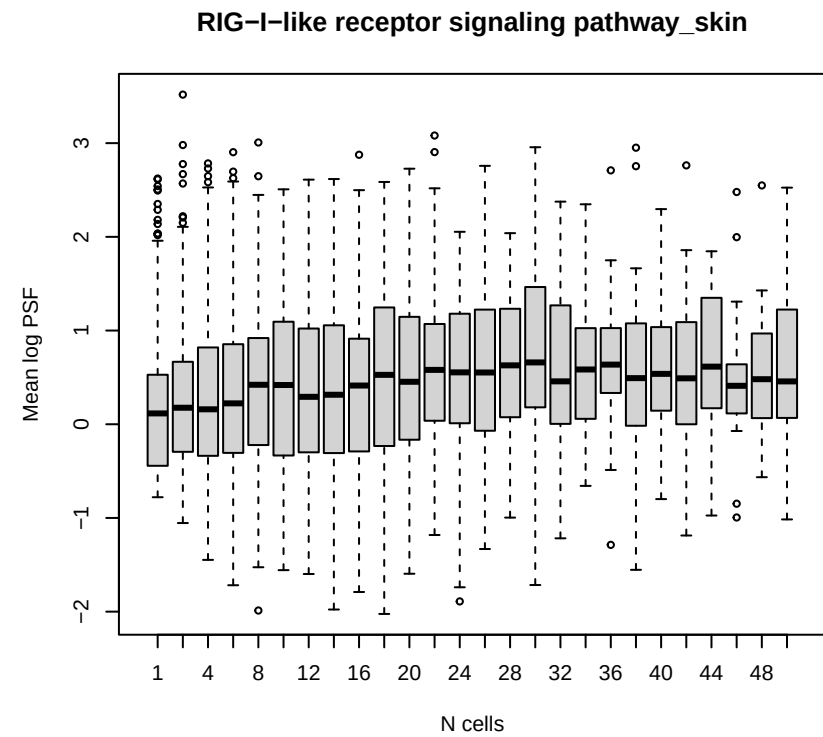
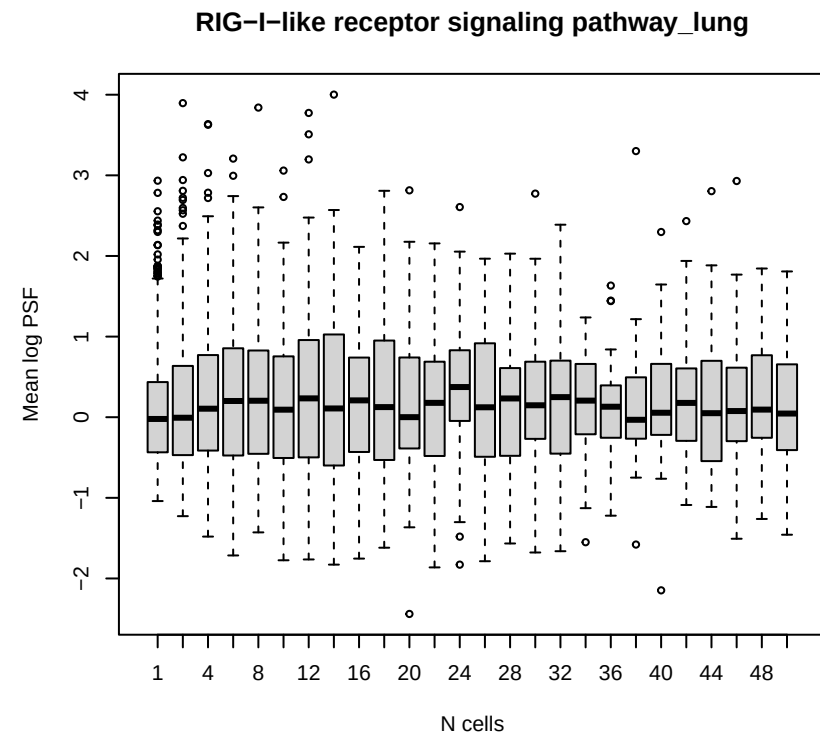
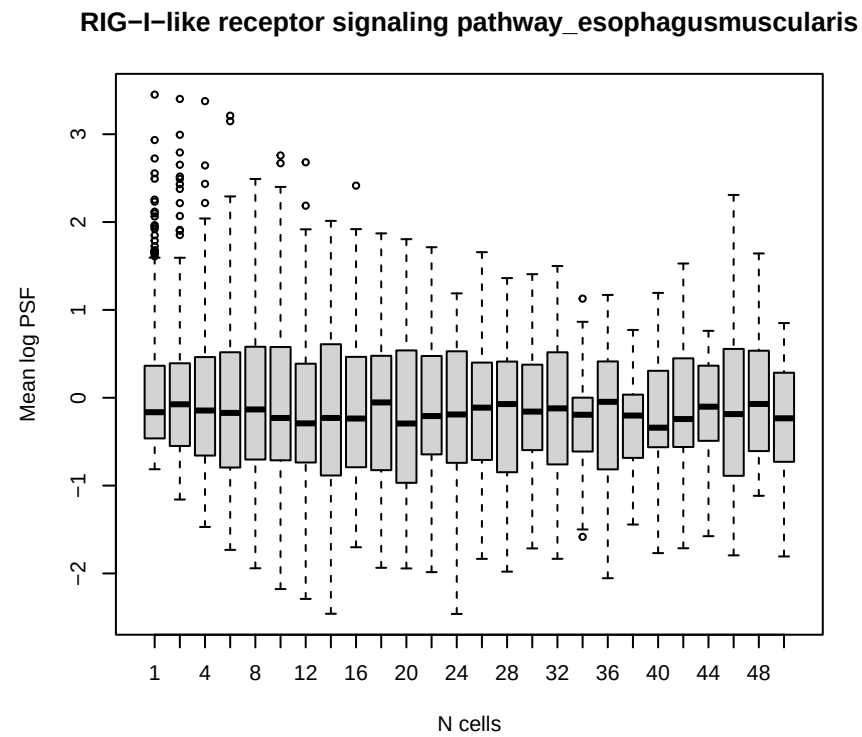
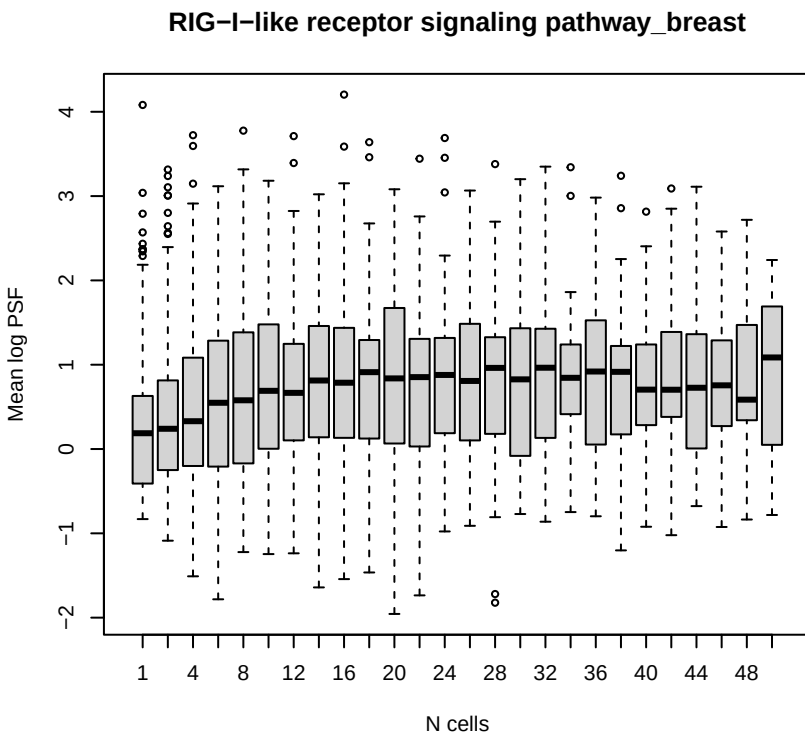
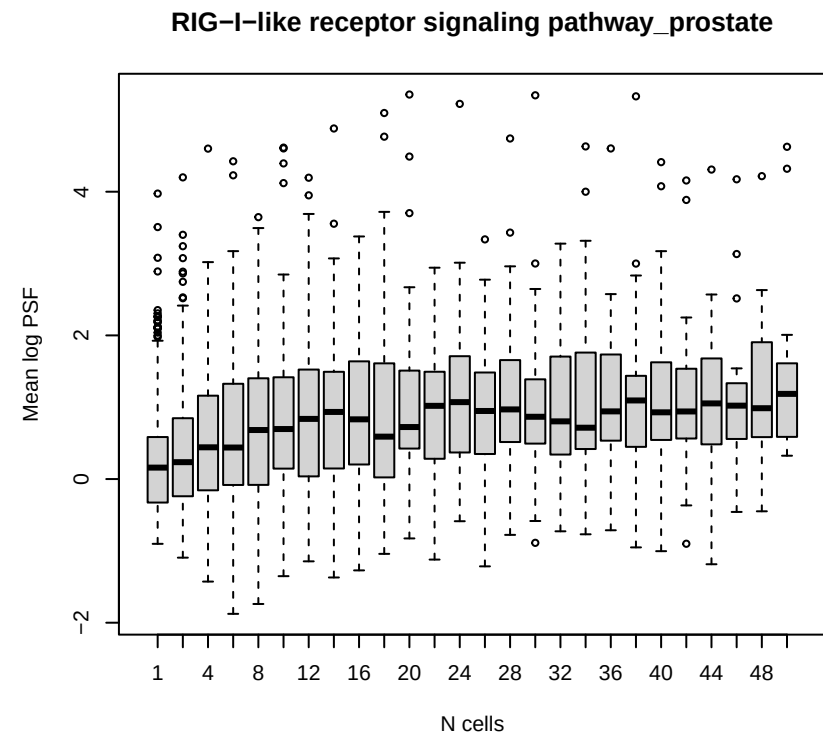
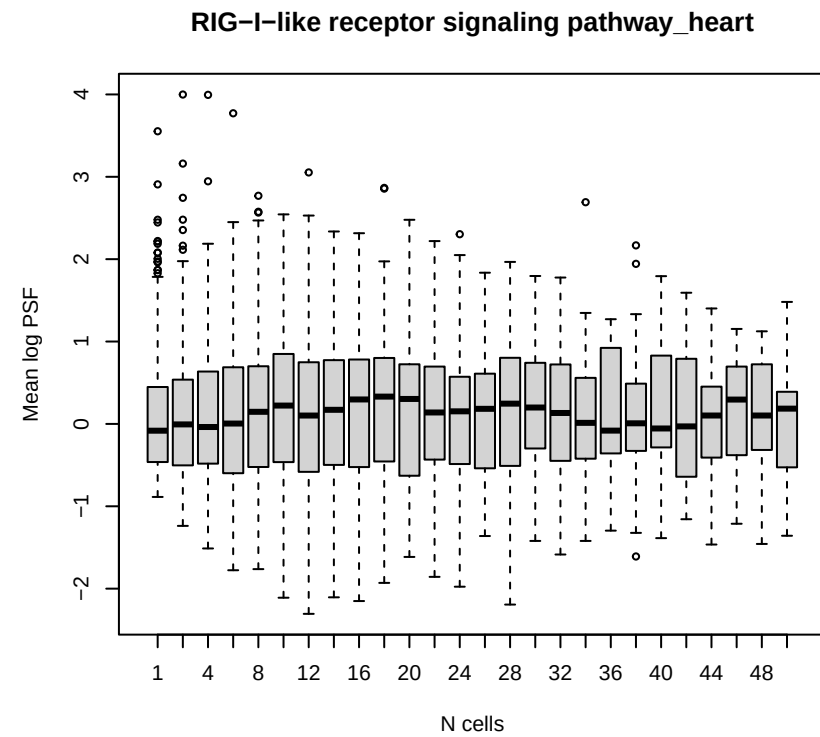
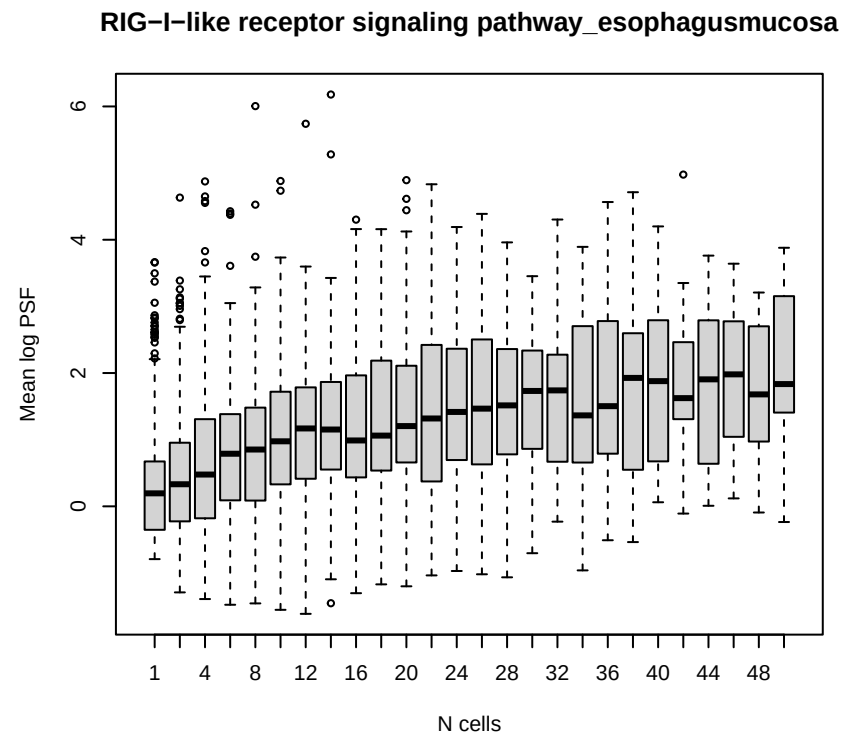
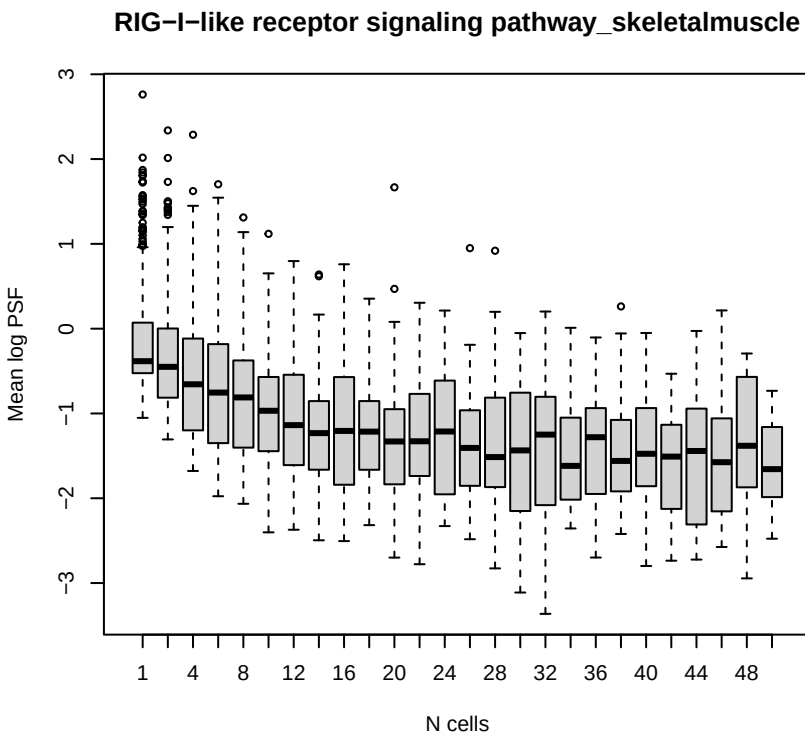
Rap1 signaling pathway_lung



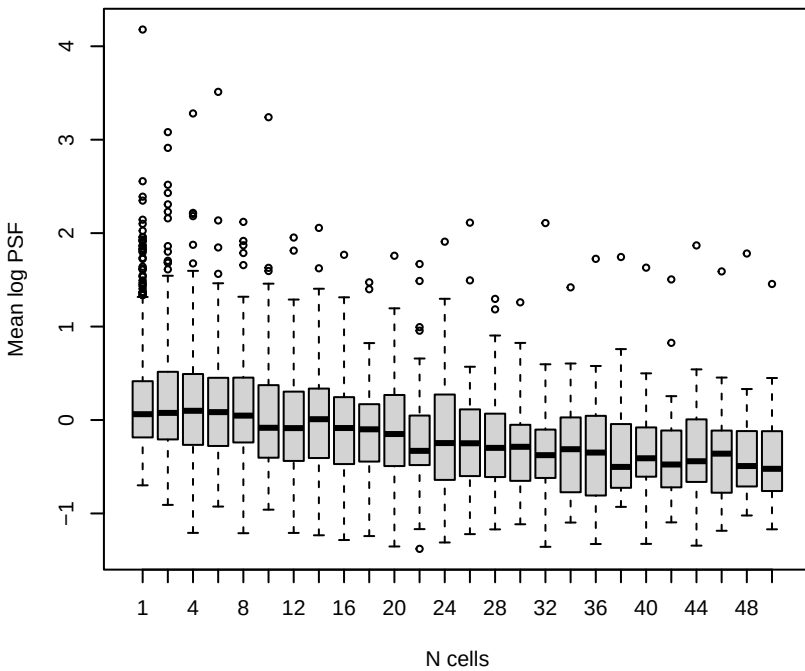
Rap1 signaling pathway_skin



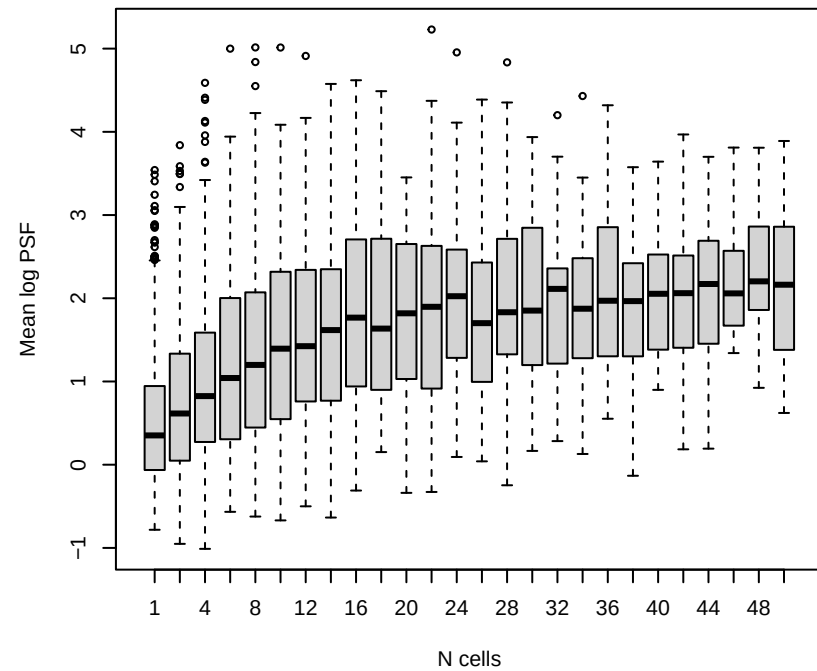




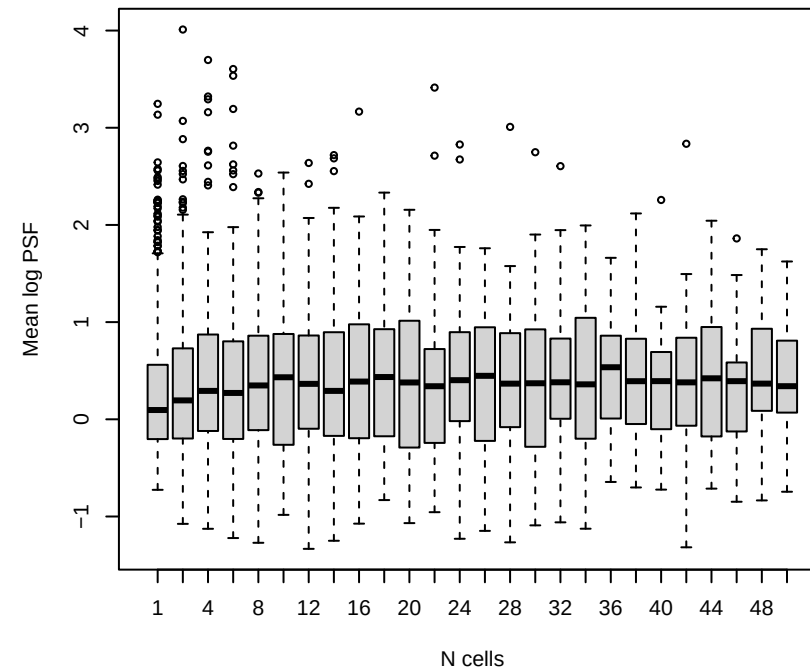
T cell receptor signaling pathway_skeletalmuscle



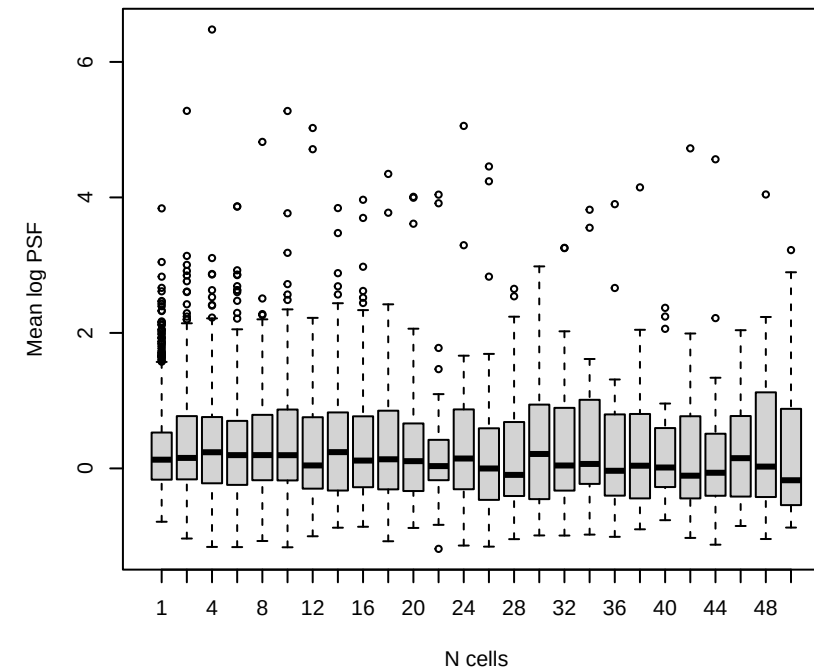
T cell receptor signaling pathway_esophagusmucosa



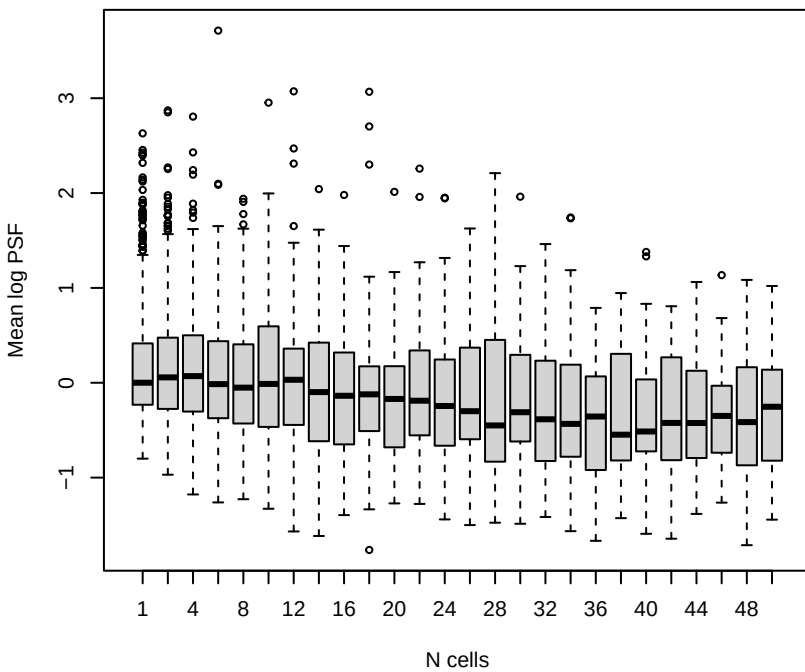
T cell receptor signaling pathway_heart



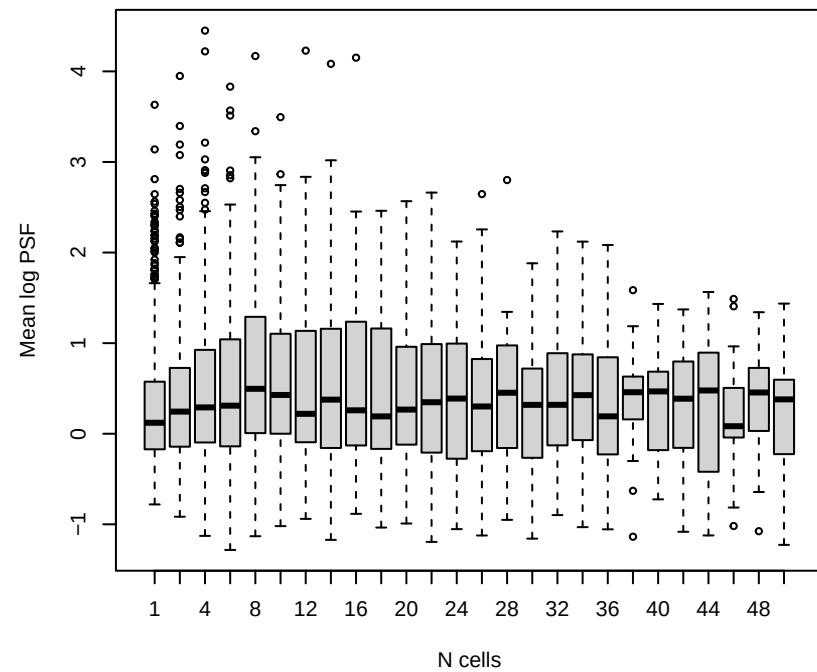
T cell receptor signaling pathway_prostate



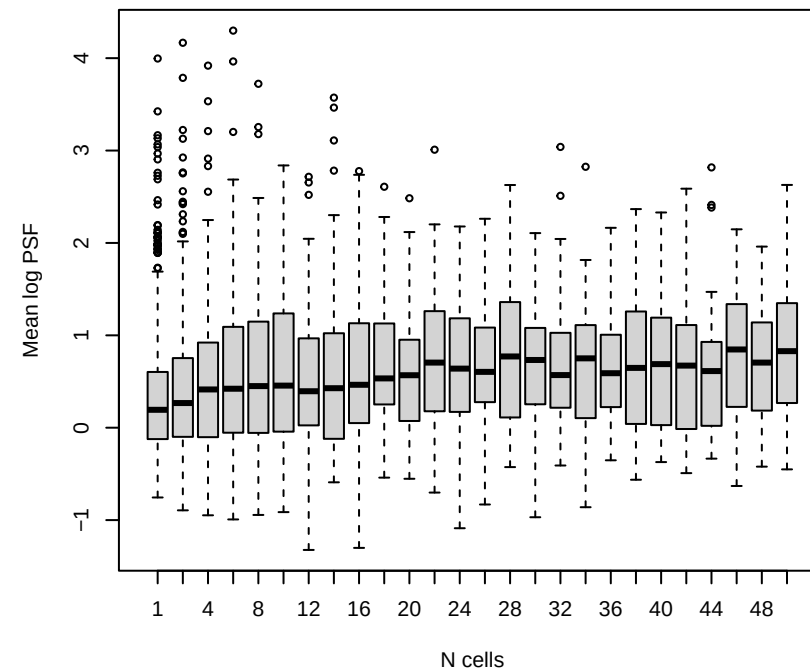
T cell receptor signaling pathway_breast



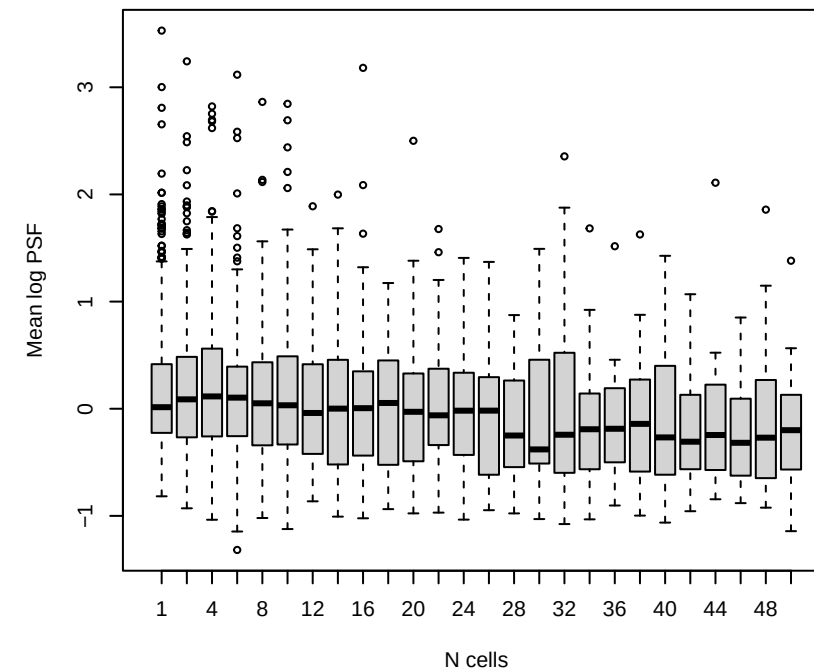
T cell receptor signaling pathway_esophagusmuscularis



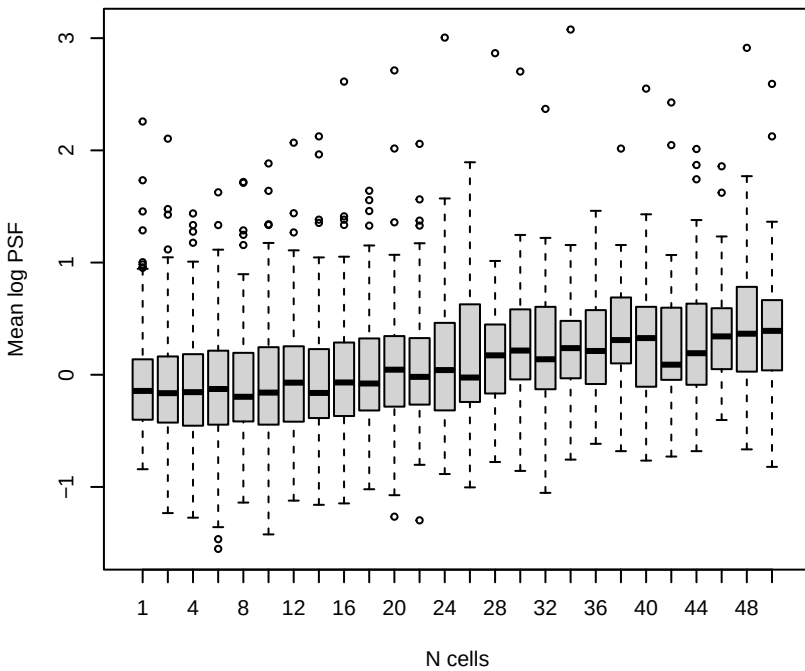
T cell receptor signaling pathway_lung



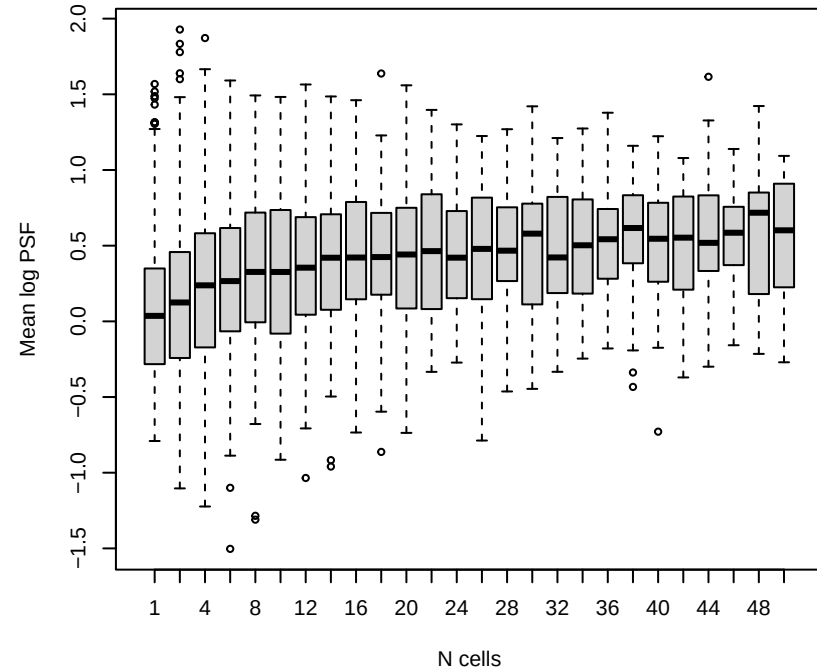
T cell receptor signaling pathway_skin



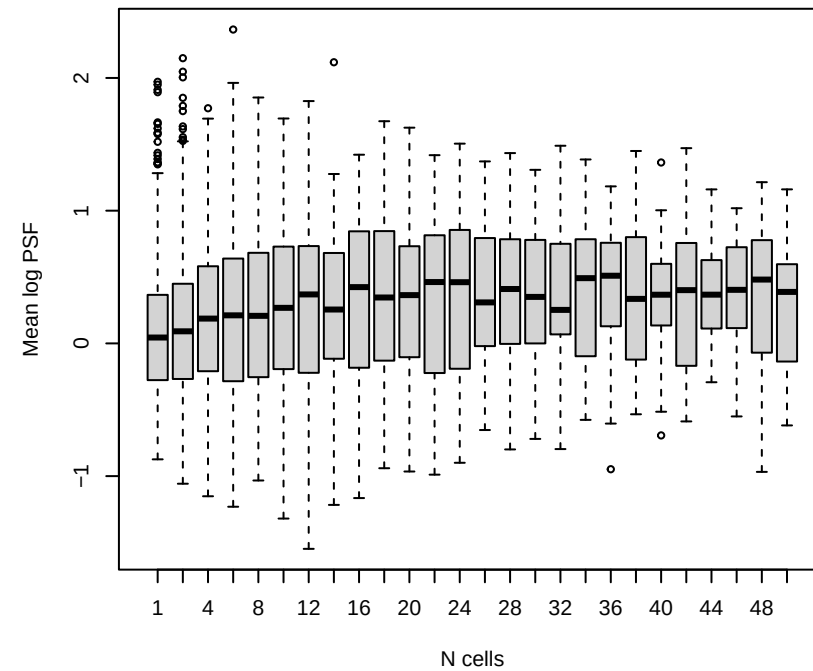
TGF-beta signaling pathway_skeletalmuscle



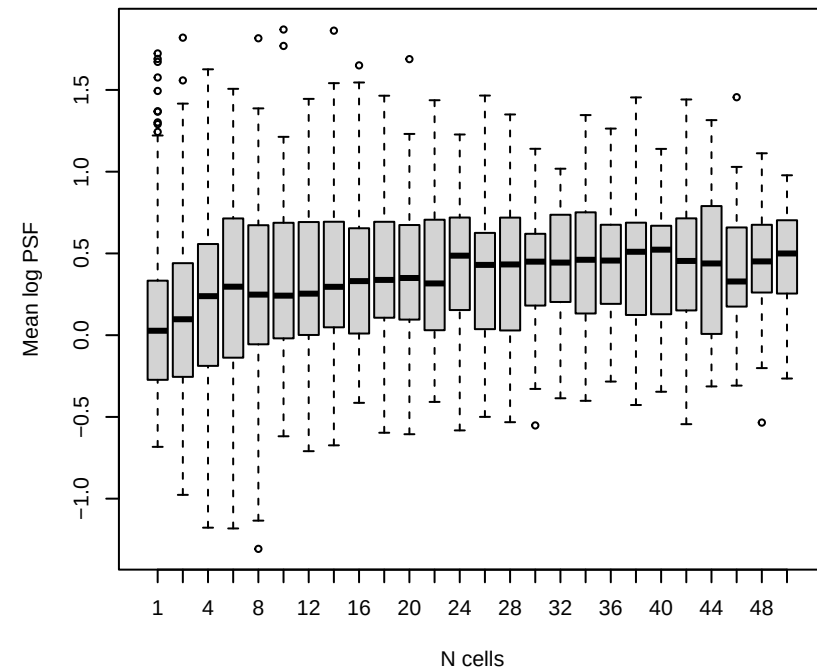
TGF-beta signaling pathway_esophagusmucosa



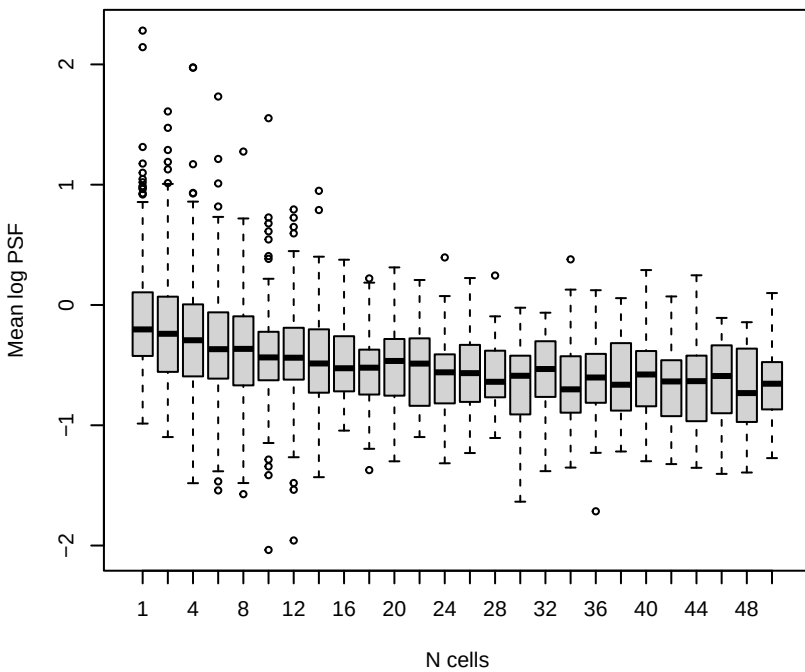
TGF-beta signaling pathway_heart



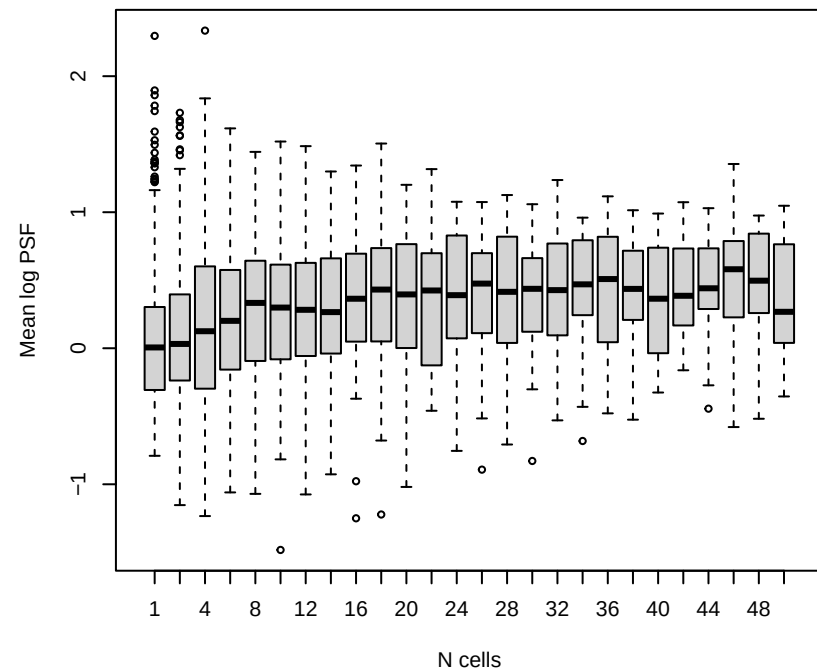
TGF-beta signaling pathway_prostate



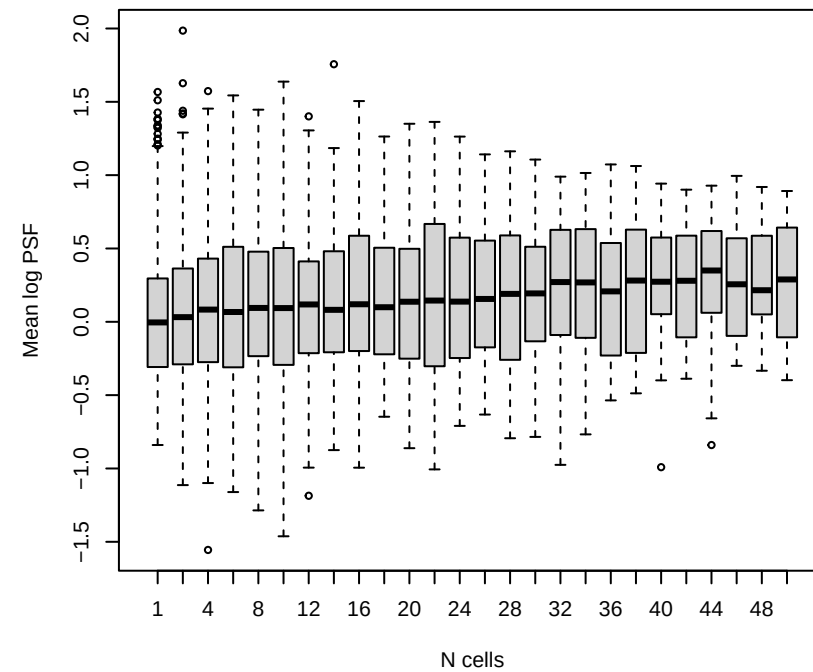
TGF-beta signaling pathway_breast



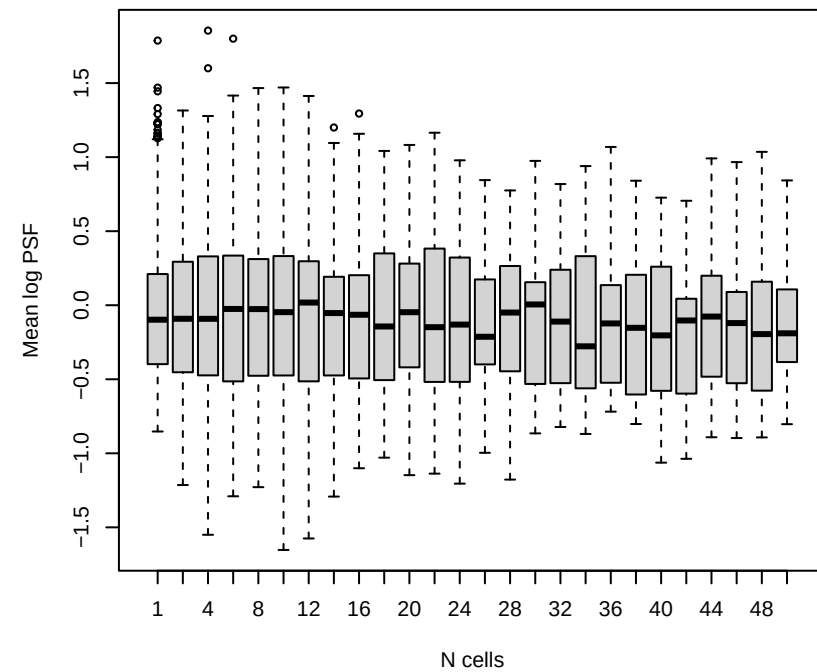
TGF-beta signaling pathway_esophagusmuscularis

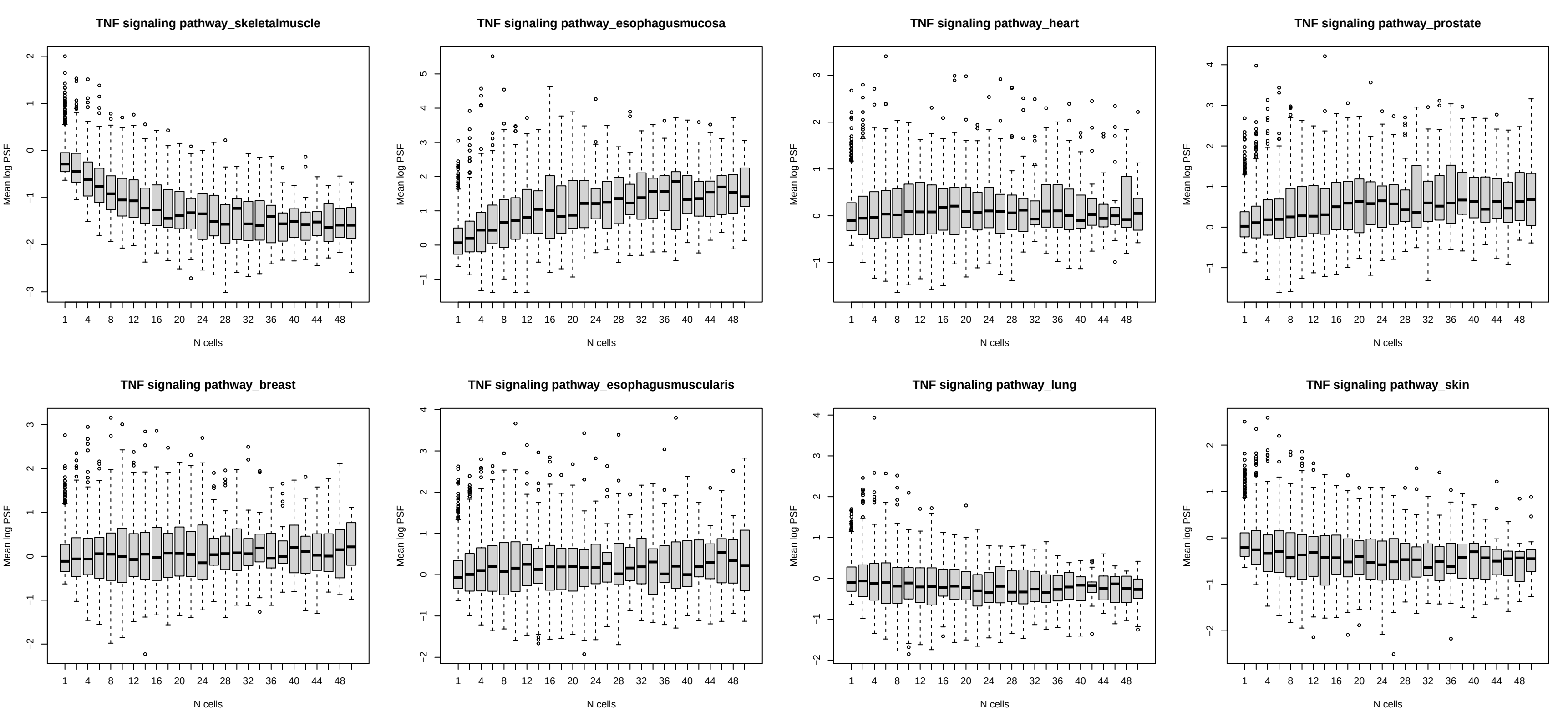


TGF-beta signaling pathway_lung

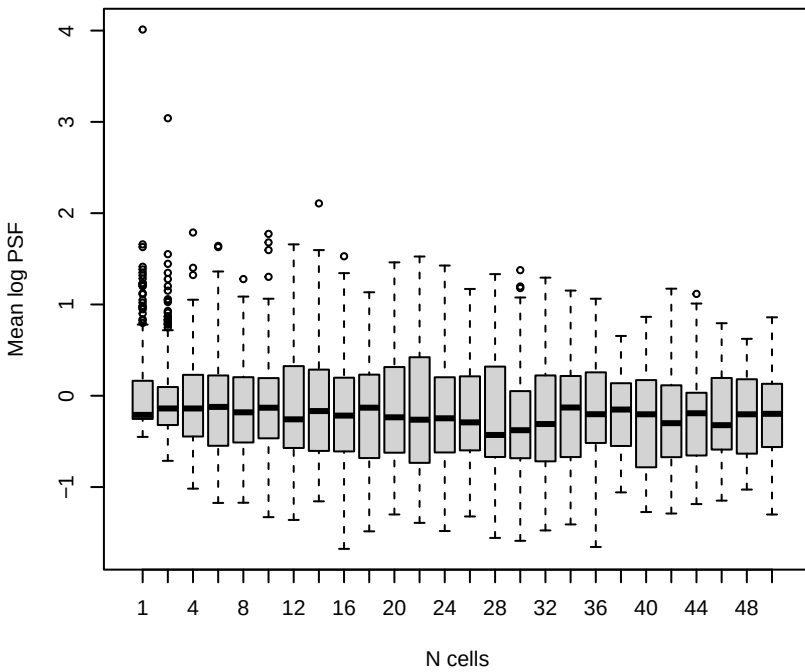


TGF-beta signaling pathway_skin

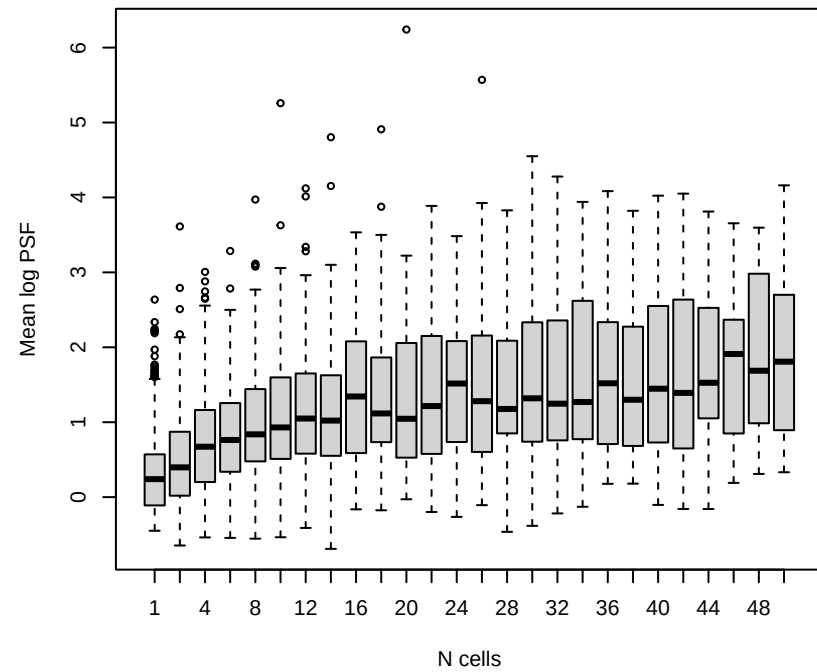




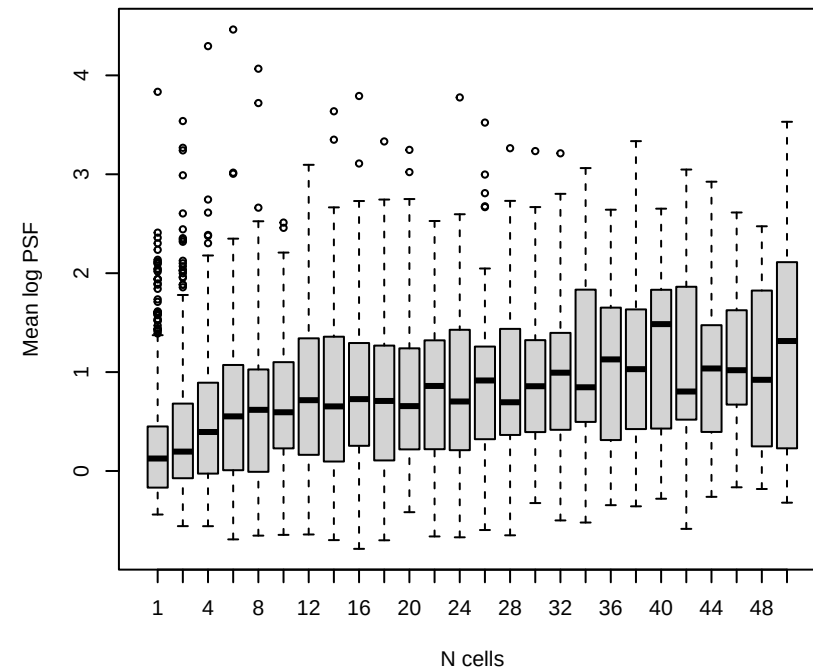
Toll-like receptor signaling pathway_skeletalmuscle



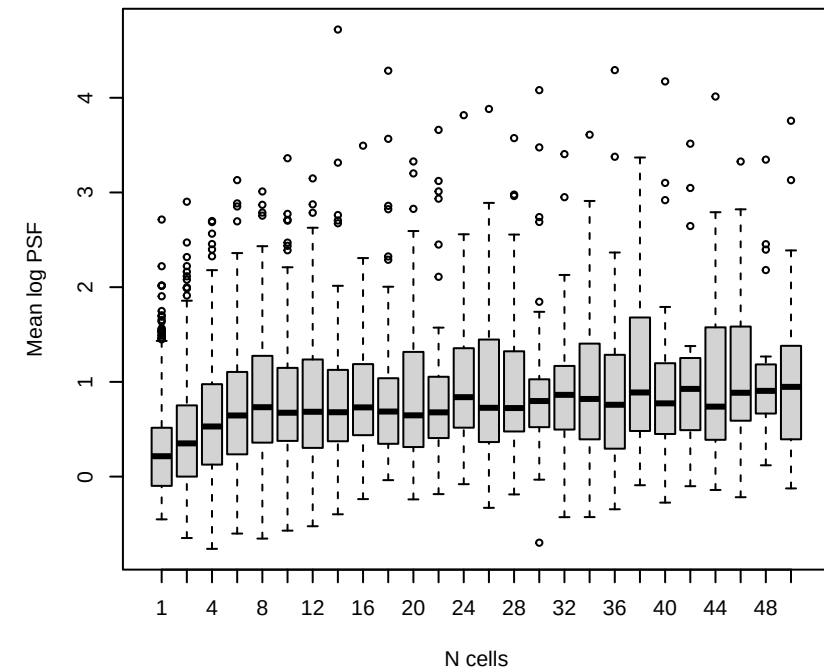
Toll-like receptor signaling pathway_esophagusmucosa



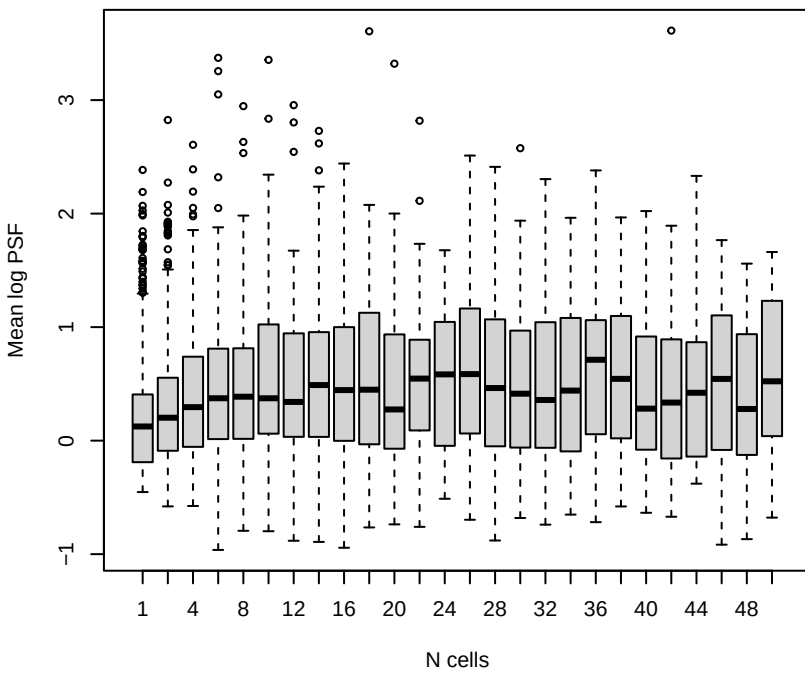
Toll-like receptor signaling pathway_heart



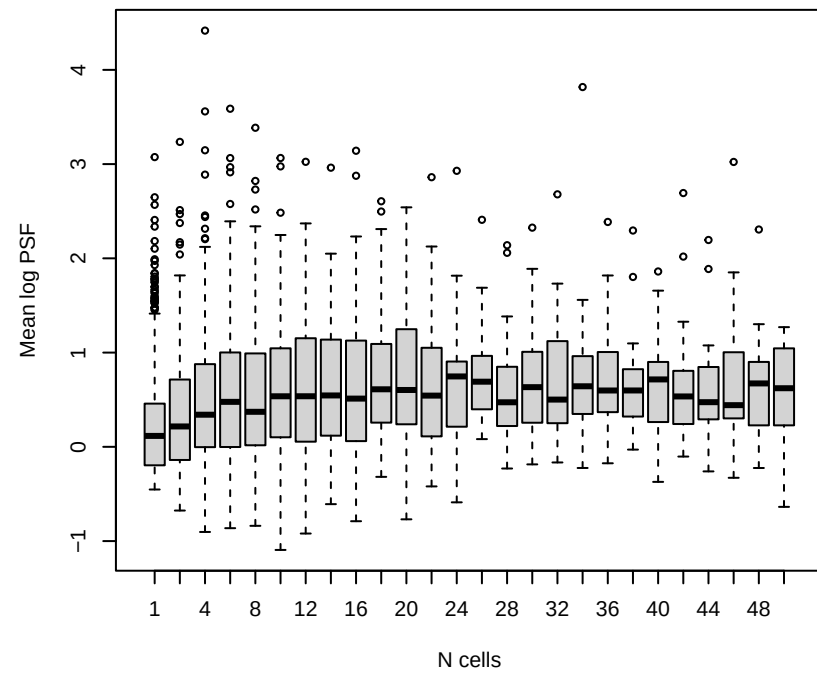
Toll-like receptor signaling pathway_prostate



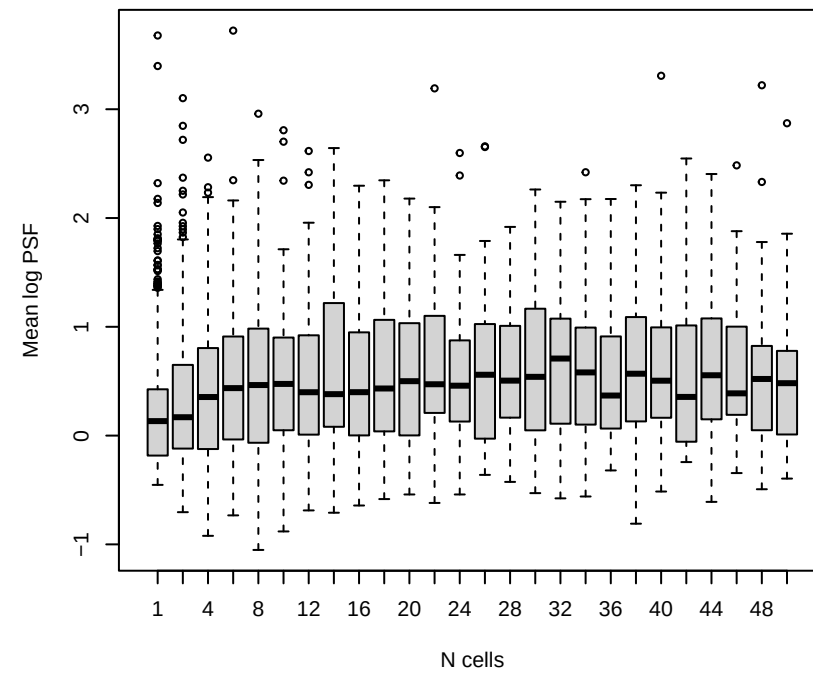
Toll-like receptor signaling pathway_breast



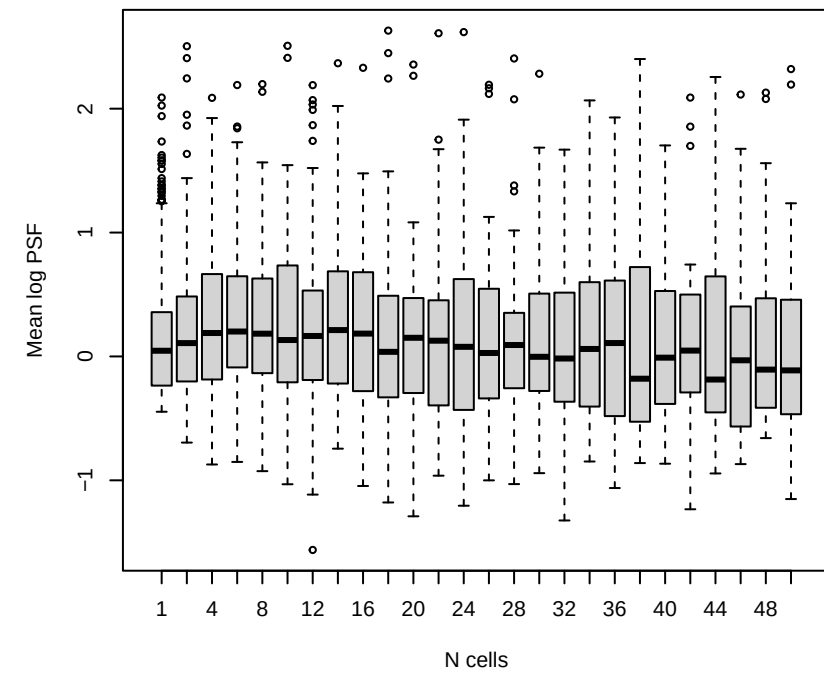
Toll-like receptor signaling pathway_esophagusmuscularis



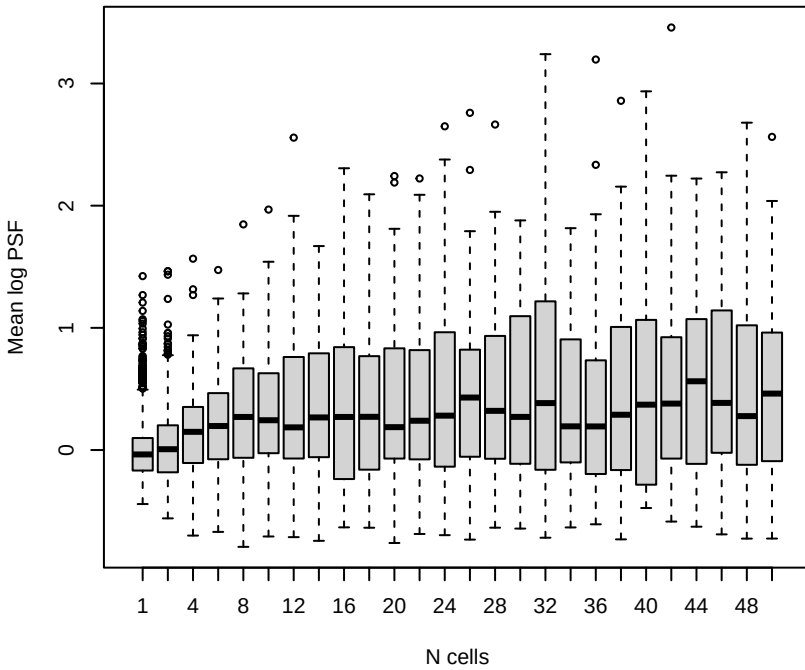
Toll-like receptor signaling pathway_lung



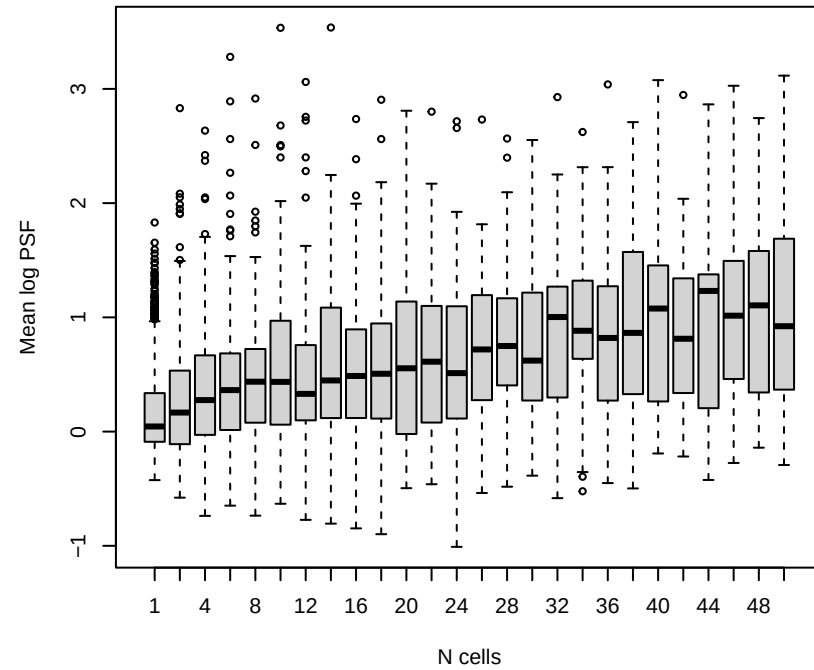
Toll-like receptor signaling pathway_skin



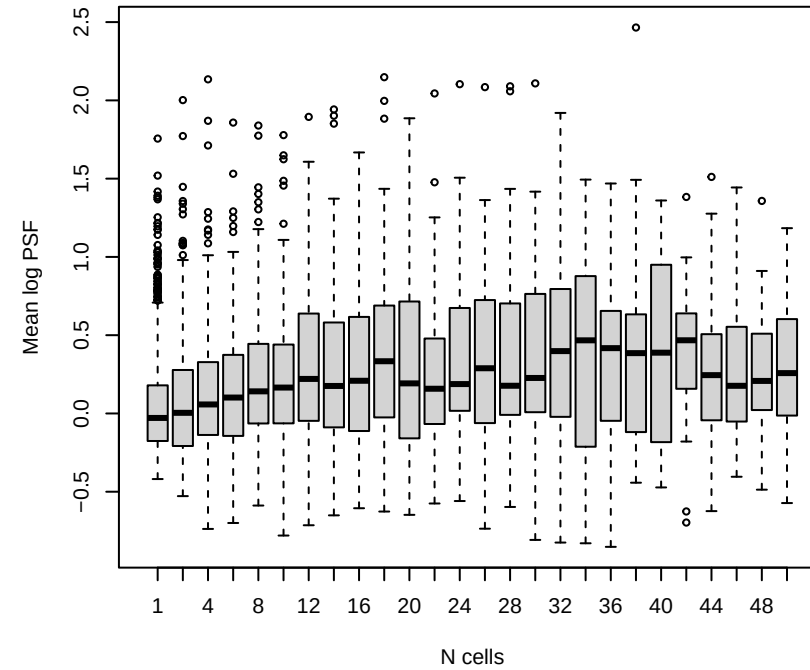
VEGF signaling pathway_skeletalmuscle



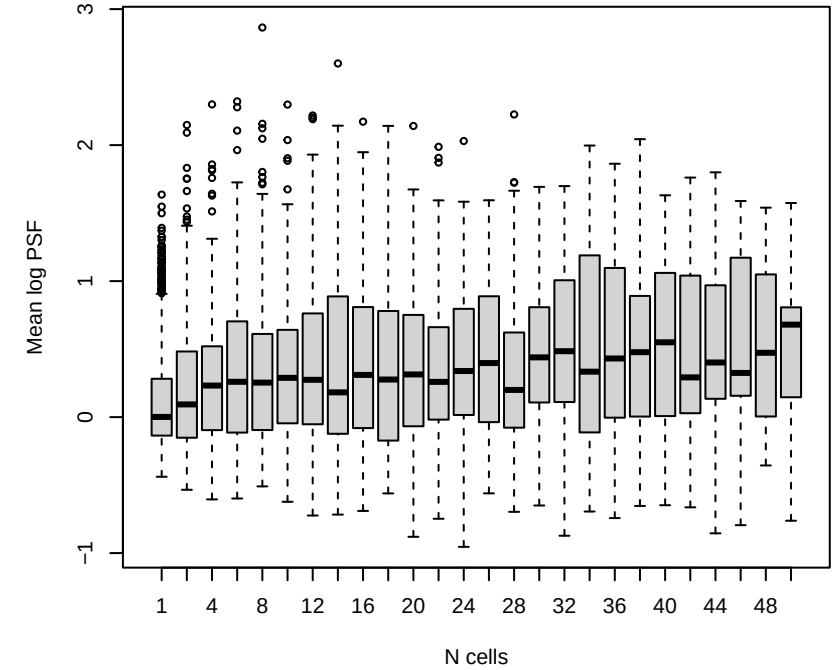
VEGF signaling pathway_esophagasmucosa



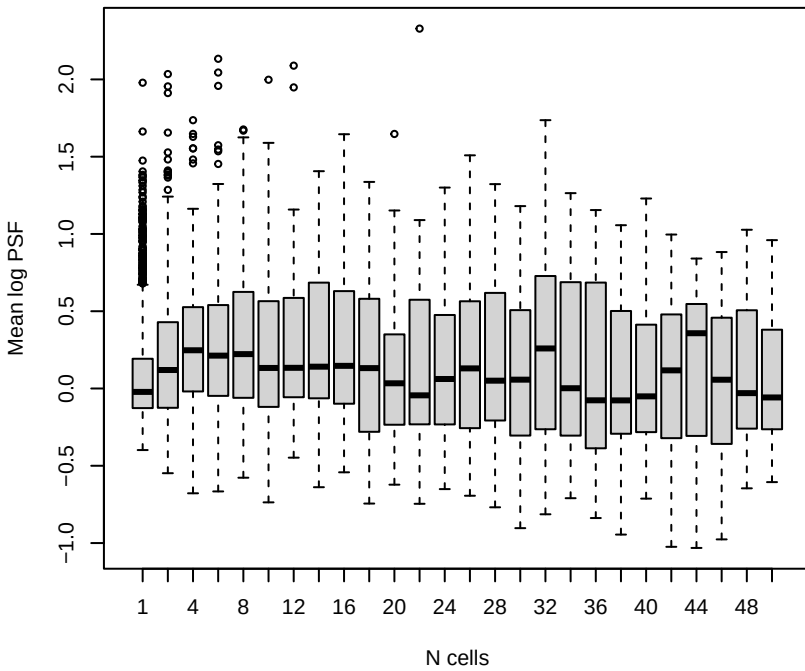
VEGF signaling pathway_heart



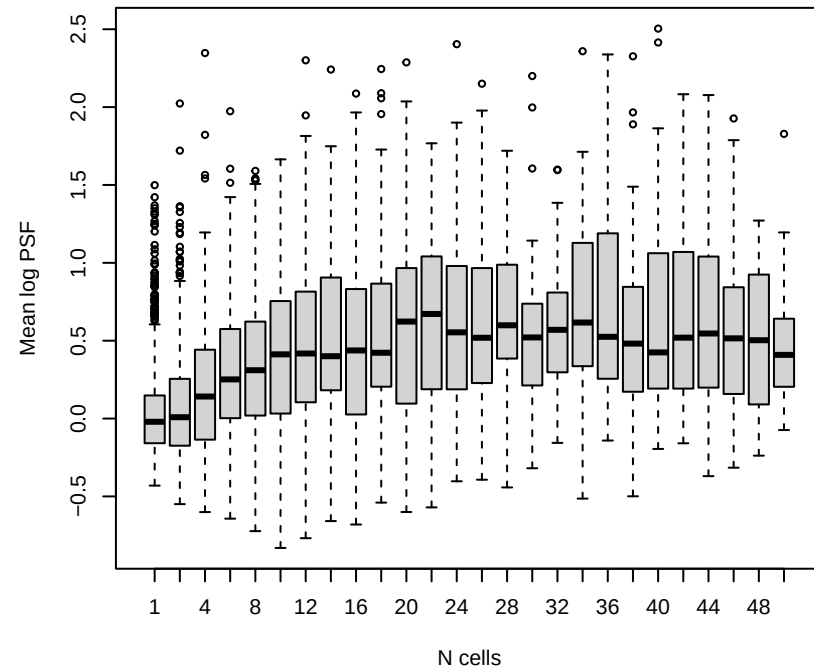
VEGF signaling pathway_prostate



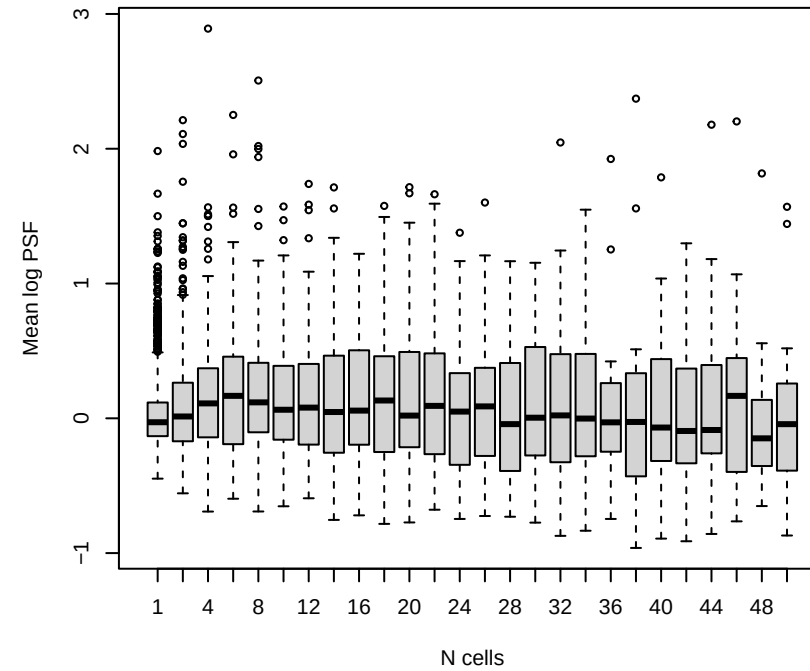
VEGF signaling pathway_breast



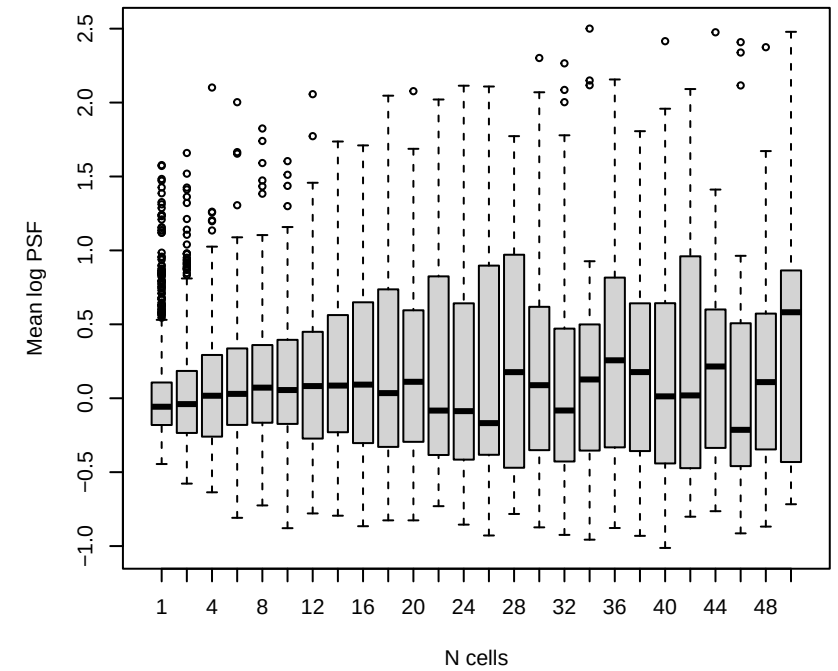
VEGF signaling pathway_esophagusmuscularis



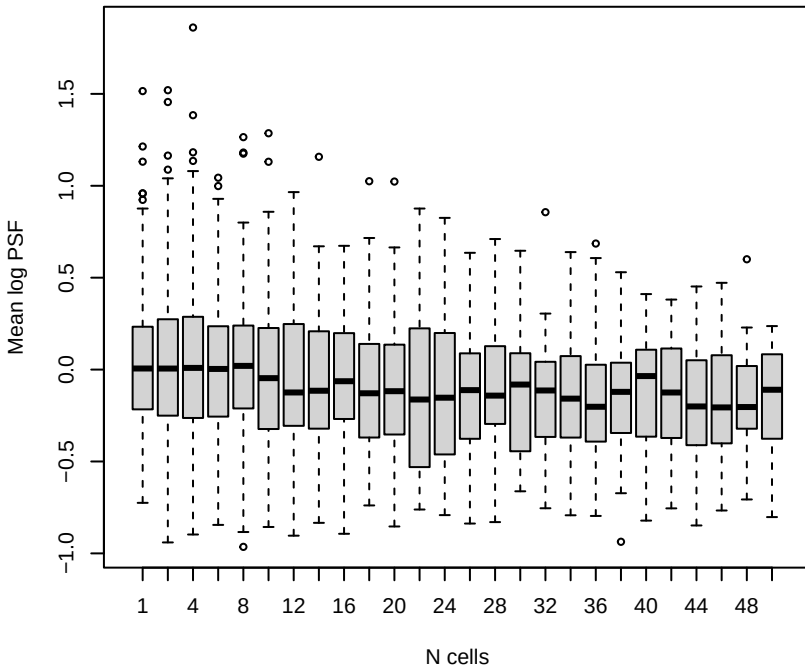
VEGF signaling pathway_lung



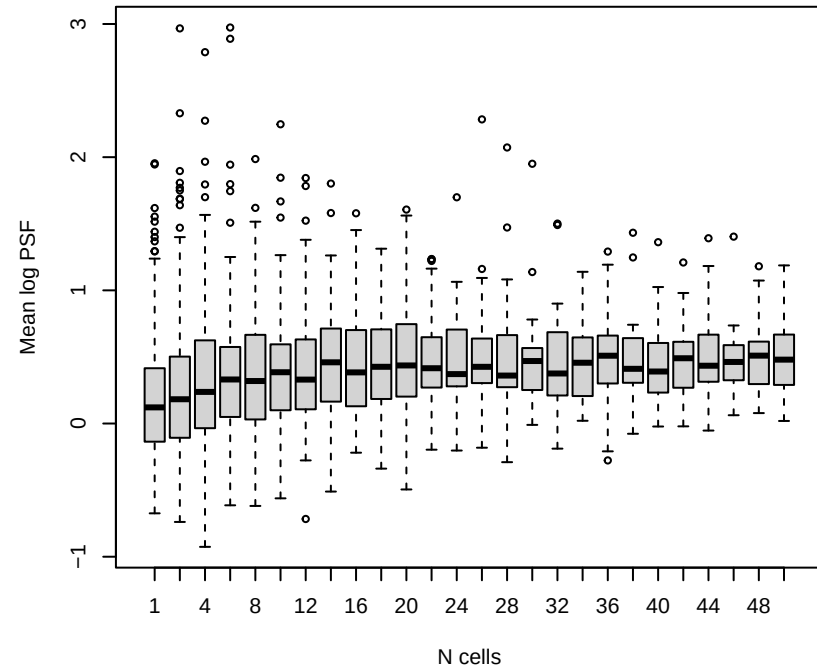
VEGF signaling pathway_skin



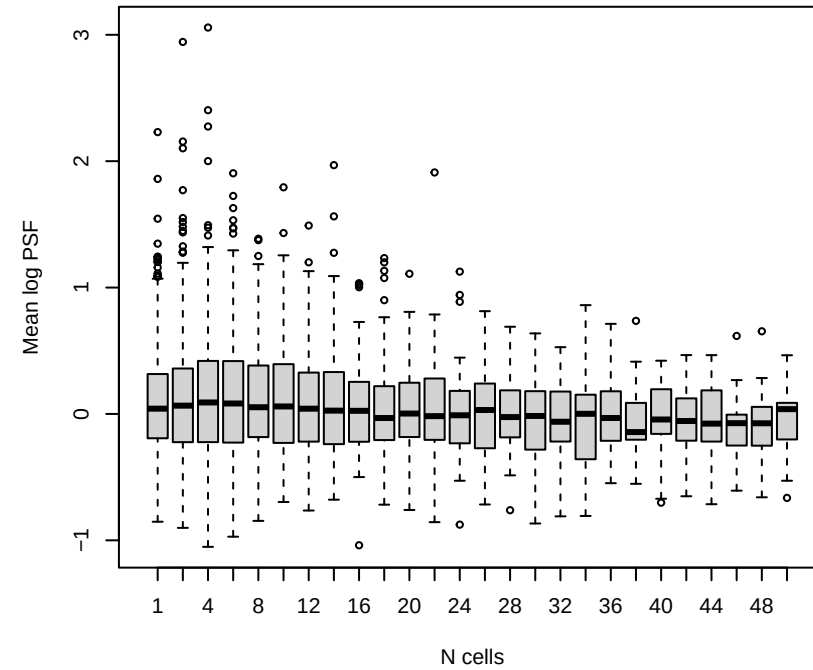
Wnt signaling pathway_skeletalmuscle



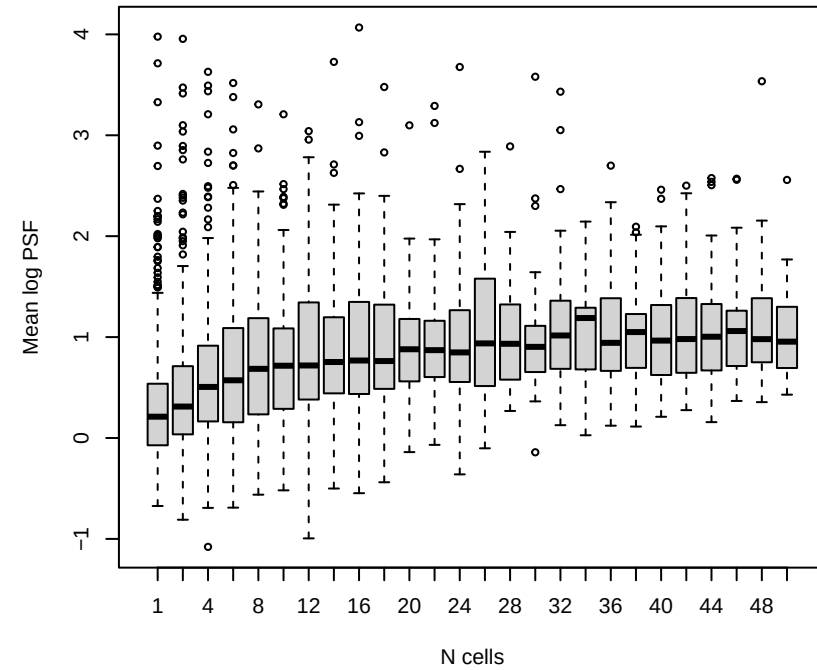
Wnt signaling pathway_esophagasmucosa



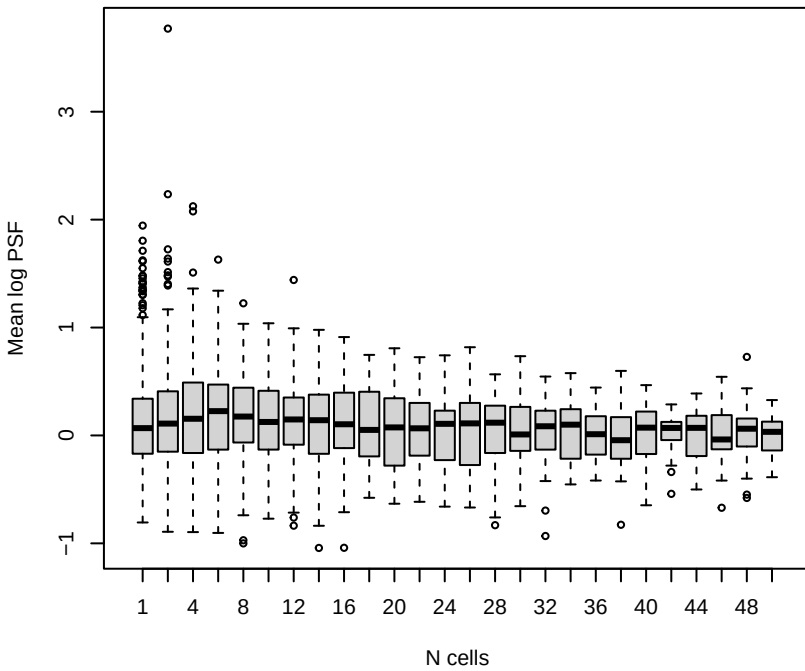
Wnt signaling pathway_heart



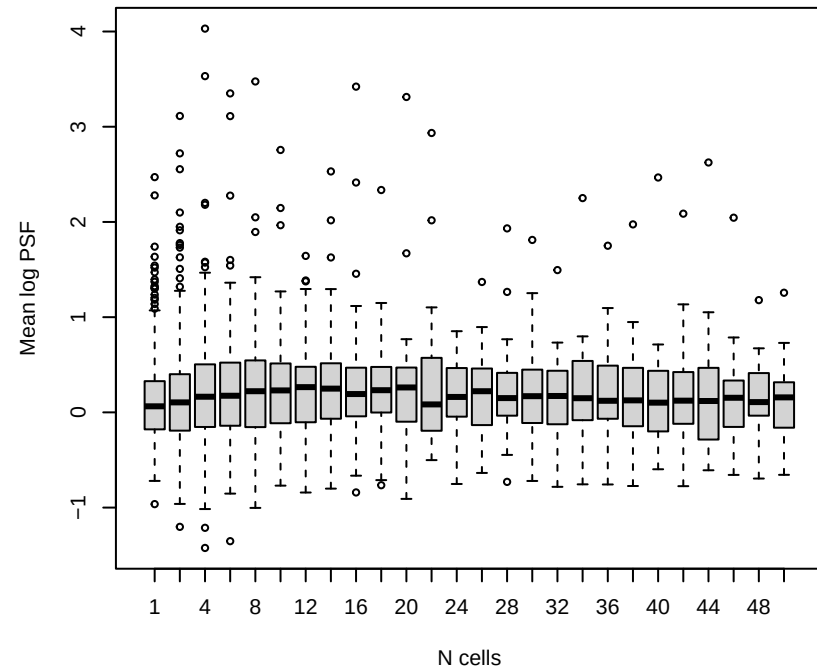
Wnt signaling pathway_prostate



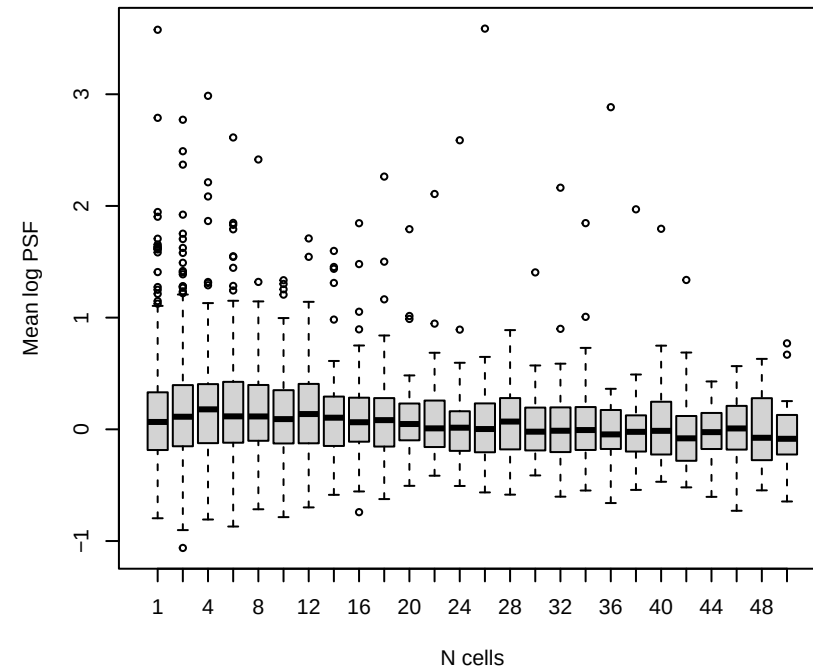
Wnt signaling pathway_breast



Wnt signaling pathway_esophagusmuscularis



Wnt signaling pathway_lung



Wnt signaling pathway_skin

