Figure 1C

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General directory setting

```
wd <- here::here()
shared <- fs::path(fs::path_dir(wd), "shared")
```

Loading packages

```
library(magrittr)
library(ggplot2)
```

Load common R scripts

```
#source(fs::path(wd, "script_r", "MISC.R"))
#source(fs::path(here::here(), "script_r", "MISC_PALETTE.R"))
```

Load script

```
source(fs::path(wd, "script_r", "MISC_FIG.R"))
readLines(fs::path(wd, "script_r", "MISC_FIG.R")) %>% cat(sep = "\n")
```

```
library(magrittr)
library(ggplot2)

COL_PALETTE <-
  viridis::inferno(6, begin = .1, end = .9) %>%
  rev() %>%
  setNames(nm = c("ZT0", "ZT3", "ZT6", "ZT12", "ZT18", "ZT21"))

LABEL_PALETTE <-
  COL_PALETTE %>%
  prismatic::clr_darken(shift = .15) %>%
  setNames(names(COL_PALETTE))

label_number_si <-
  purrr::partial(scales::label_number, scale_cut = scales::cut_short_scale())

ggsave_single <- function(..., width = 86, height = 230, dpi = 300) {
  f <- purrr::partial(ggsave, width = width, height = height, dpi = dpi, units = "mm")
  f(...)
}

ggsave_double <- function(..., width = 178, height = 230, dpi = 300) {
  f <- purrr::partial(ggsave, width = width, height = height, dpi = dpi, units = "mm")
  f(...)
}

#' Utility functions for making secondary y-axis
#' @param y1 numeric vector
#' @param y2 numeric vector
#' @name util_2nd_axis
```

```
#' @examples
#' make_scale_y1_to_y2(1:5, 6:10)(1:10)
#' make_scale_y2_to_y1(1:5, 6:10)(1:10)
#'
#' iris_ <- dplyr::select(iris, x = Sepal.Length, y1 = Petal.Length, y2 = Petal.Width)
#' gp1 <-
#'   iris_ %>%
#'   ggplot() +
#'   geom_point(aes(x, y1), color = "#CD3700") +
#'   geom_point(aes(x, y2), color = "#473C8B")
#'
#' to_y1 <- with(iris_, {make_scale_y2_to_y1(y1, y2)})
#' to_y2 <- with(iris_, {make_scale_y1_to_y2(y1, y2)})
#' gp2 <-
#'   iris_ %>%
#'   ggplot() +
#'   geom_point(aes(x, y1), color = "#CD3700") +
#'   geom_point(aes(x, y = to_y1(y2)), color = "#473C8B") +
#'   scale_y_continuous(sec.axis = sec_axis(trans = to_y2, name = "y2"))
#' patchwork::wrap_plots(gp1, gp2)
#'
NULL

#' Create transformation function of range(y1) to range(y2)
#' @rdname util_2nd_axis
#' @export
#'
make_scale_y1_to_y2 <- function(y1, y2) {
  function(n) {
    scales:::rescale.numeric(
      n,
      to = range(y2, na.rm = TRUE, finite = TRUE),
      from = range(y1, na.rm = TRUE, finite = TRUE)
    )
  }
}

#' Create transformation function of range(y2) to range(y1)
#' @rdname util_2nd_axis
#' @export
#'
make_scale_y2_to_y1 <- function(y1, y2) {
  function(n) {
    scales:::rescale.numeric(
      n,
      to = range(y1, na.rm = TRUE, finite = TRUE),
      from = range(y2, na.rm = TRUE, finite = TRUE)
    )
  }
}

#' Create transformation function of range(y2) to range(y1)
#' @rdname util_2nd_axis
#' @export
#'
make_scale_y2_to_y1_se <- function(y1, y2) {
  to <- range(y1, na.rm = TRUE, finite = TRUE)
  from <- range(y2, na.rm = TRUE, finite = TRUE)
  function(n) n / (diff(from) / diff(to))
}
```

Directory setting

```
dir_output <- fs::path("analysis", "fig", "fig01C")
path_out <- function(...) fs::path(wd, dir_output, ...)
fs::dir_create(path_out())
```

Load input data

```
tbl_plot_all <-
  fs::path(wd, "analysis", "out_ribowaltz", "metaplof_psite") %>%
  fs::dir_ls(regexp = "_all.csv$") %>%
  purrr::map(readr::read_csv, show_col_types = FALSE) %>%
  purrr::map(dplyr::rename, count = 3) %>%
  purrr::imap(~ dplyr::mutate(.x, sample = fs::path_file(.y))) %>%
  dplyr::bind_rows() %>%
  dplyr::mutate(
    fname = stringr::str_extract(sample, "zt\\d+_[12]") %>%
      stringr::str_to_upper(),
    cond = stringr::str_extract(fname, "ZT\\d+"),
    rep = stringr::str_extract(fname, "[12]$")
  )

tbl_plot_sub <-
  fs::path(wd, "analysis", "out_ribowaltz", "metaplof_psite") %>%
  fs::dir_ls(regexp = "_\\d+.csv$") %>%
  purrr::map(readr::read_csv, show_col_types = FALSE) %>%
  purrr::map(dplyr::rename, count = 3) %>%
  purrr::imap(~ dplyr::mutate(.x, sample = fs::path_file(.y))) %>%
  dplyr::bind_rows() %>%
  dplyr::mutate(
    fname = stringr::str_extract(sample, "zt\\d+_[12]") %>%
      stringr::str_to_upper(),
    cond = stringr::str_extract(fname, "ZT\\d+"),
    rep = stringr::str_extract(fname, "[12]$"),
    read_len = stringr::str_extract(sample, "_(\\d+).csv$", group = 1)
  )

tbl_plot_vline <-
  dplyr::bind_rows(
    tibble::tibble(
      nt = seq(0, 40, by = 3),
      reg = "Distance from start (nt)"
    ),
    tibble::tibble(
      nt = seq(-2, -40, by = -3),
      reg = "Distance from stop (nt)"
    )
  )

tbl_plot_start_stop <-
  tibble::tibble(
    nt = c(0, 1),
    reg = c("Distance from start (nt)", "Distance from stop (nt)")
  )
```

Plotting

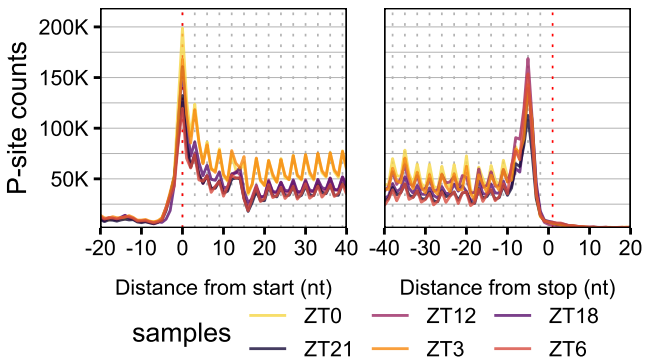
```
theme_fig01C <- function(base_size = 10, base_line_size = 1/22) {
  list(
    theme_linedraw(
      base_size = base_size,
      base_line_size = base_line_size
```

```
    )
  )
}
```

Fig. 1C

```
gp <-
  tbl_plot_all %>%
  dplyr::filter(rep == "1") %>%
  ggplot(aes(distance, count, group = cond)) +
  geom_vline(data = tbl_plot_vline, aes(xintercept = nt),
             linetype = "dotted", color = "grey70", linewidth = .3) +
  geom_vline(data = tbl_plot_start_stop, aes(xintercept = nt),
             linetype = "dotted", color = "red", linewidth = .3) +
  geom_line(aes(color = cond), alpha = .8) +
  facet_wrap(~ reg, scales = "free_x", strip.position = "bottom") +
  scale_color_manual(values = COL_PALETTE) +
  scale_x_continuous(expand = expansion(0)) +
  scale_y_continuous(labels = label_number_si(), expand = expansion(mult = c(0, .1))) +
  labs(x = "", y = "P-site counts") +
  theme_fig01C(base_line_size = 1) +
  theme(
    panel.spacing.x = unit(5, units = "mm"),
    panel.grid.major.x = element_blank(),
    panel.grid.minor.x = element_blank(),
    panel.grid.major.y = element_line(color = "grey70"),
    panel.grid.minor.y = element_line(color = "grey70"),
    strip.placement = "outside",
    strip.text = element_text(color = "black"),
    strip.background = element_rect(fill = NA, color = NA),
    legend.margin = margin(-8, 0, 0, 0, "mm")
  ) +
  guides(
    color = guide_legend(title = "samples", title.position = "left",
                         nrow = 2, byrow = TRUE, keyheight = unit(1, "mm"))
  ) +
  theme(legend.position = "bottom", legend.direction = "vertical")
ggsave_single(gp, filename = path_out("fig01C_type2_s.png"), height = 50)
ggsave_single(gp, filename = path_out("fig01C_type2_s.svg"), height = 50)
```

```
knitr::include_graphics(path_out("fig01C_type2_s.svg"))
```



Sessioninfo

```
sessionInfo()
```

```
R version 4.2.1 (2022-06-23)
Platform: aarch64-apple-darwin20 (64-bit)
Running under: macOS Ventura 13.1

Matrix products: default
BLAS:   /Library/Frameworks/R.framework/Versions/4.2-arm64/Resources/lib/libRblas.0.dylib
LAPACK: /Library/Frameworks/R.framework/Versions/4.2-arm64/Resources/lib/libRlapack.dylib

locale:
[1] en_US.UTF-8/en_US.UTF-8/en_US.UTF-8/C/en_US.UTF-8/en_US.UTF-8

attached base packages:
[1] stats     graphics  grDevices datasets  utils     methods   base

other attached packages:
[1] ggplot2_3.4.2  magrittr_2.0.3

loaded via a namespace (and not attached):
 [1] tidyselect_1.2.0    xfun_0.40           purrr_1.0.1
 [4] colorspace_2.0-3    vctrs_0.6.1         generics_0.1.3
 [7] htmltools_0.5.3     viridisLite_0.4.1   yaml_2.3.6
[10] utf8_1.2.2          rlang_1.1.0         pillar_1.9.0
[13] glue_1.6.2          withr_2.5.0         bit64_4.0.5
[16] lifecycle_1.0.3     stringr_1.5.0       munsell_0.5.0
[19] gtable_0.3.1        ragg_1.2.5          evaluate_0.20
[22] labeling_0.4.2      knitr_1.42          tzdb_0.3.0
[25] fastmap_1.1.0       parallel_4.2.1      fansi_1.0.3
[28] readr_2.1.4         renv_1.0.3          scales_1.2.1
[31] BiocManager_1.30.18 vroom_1.6.0         jsonlite_1.8.4
[34] farver_2.1.1        fs_1.5.2            systemfonts_1.0.4
[37] bit_4.0.5           textshaping_0.3.6   gridExtra_2.3
[40] hms_1.1.3           digest_0.6.31       stringi_1.7.12
[43] dplyr_1.1.1         grid_4.2.1          rprojroot_2.0.3
[46] here_1.0.1          cli_3.6.0           tools_4.2.1
[49] tibble_3.2.1        crayon_1.5.2        pkgconfig_2.0.3
[52] svglite_2.1.0       rmarkdown_2.24      rstudioapi_0.14
[55] viridis_0.6.2       R6_2.5.1            prismatic_1.1.1
[58] compiler_4.2.1
```