```
(***Note: Values for generating these plots are embedded within the raw data set,
which is too large to upload onto the public data repository***)

(*********************************************)
(*******Generate plot in Figure S5C***************)
(*********************************************)

In[ ]:= (**************RiboGCaMP data******************)

In[ ]:= dateMouseSessionList =
  {{"060323", "Mouse493a", "Session1"}, {"060323", "Mouse493a", "Session2"},
   {"060323", "Mouse493a", "Session3"}, {"060323", "Mouse493b", "Session1"},
   {"060323", "Mouse493b", "Session2"}, {"060323", "Mouse493b", "Session1"},
   {"060323", "Mouse493b", "Session2"}, {"060323", "Mouse493b", "Session1"}};

In[ ]:= numROIsList =
  Table[Length[FileNames["*.txt", StringJoin["S:/Imaging/Garrett/FMB208_2PRig/",
      dateMouseSessionList[[n, 1]], "/", dateMouseSessionList[[n, 2]],
      "/", dateMouseSessionList[[n, 3]], "/ForG6sVsRiboG/NeuropilFs/"]]],
   {n, 1, Length[dateMouseSessionList]}];

neuropilFs = Flatten[
   Table[Table[ToExpression /@ Import[StringJoin["S:/Imaging/Garrett/FMB208_2PRig/",
        dateMouseSessionList[[n, 1]], "/", dateMouseSessionList[[n, 2]],
        "/", dateMouseSessionList[[n, 3]], "/ForG6sVsRiboG/NeuropilFs/",
        "fNP", ToString[roi], ".txt"], "List"], {roi, 1, numROIsList[[n]]}],
    {n, 1, Length[dateMouseSessionList]}], 1];(*Neuropil fluorescence values*)

neuropildFs = Flatten[
   Table[Table[ToExpression /@ Import[StringJoin["S:/Imaging/Garrett/FMB208_2PRig/",
        dateMouseSessionList[[n, 1]], "/", dateMouseSessionList[[n, 2]],
        "/", dateMouseSessionList[[n, 3]], "/ForG6sVsRiboG/NeuropildFs/",
        "dfNP", ToString[roi], ".txt"], "List"], {roi, 1, numROIsList[[n]]}],
    {n, 1, Length[dateMouseSessionList]}], 1];(*Neuropil dF values*)

cellbodyFs = Flatten[
   Table[Table[ToExpression /@ Import[StringJoin["S:/Imaging/Garrett/FMB208_2PRig/",
        dateMouseSessionList[[n, 1]], "/", dateMouseSessionList[[n, 2]],
        "/", dateMouseSessionList[[n, 3]], "/ForG6sVsRiboG/CellBodyFs/",
        "fCB", ToString[roi], ".txt"], "List"], {roi, 1, numROIsList[[n]]}],
    {n, 1, Length[dateMouseSessionList]}], 1];(*Cell body fluorescence values*)

cellbodydFs = Flatten[
   Table[Table[ToExpression /@ Import[StringJoin["S:/Imaging/Garrett/FMB208_2PRig/",
        dateMouseSessionList[[n, 1]], "/", dateMouseSessionList[[n, 2]],
        "/", dateMouseSessionList[[n, 3]], "/ForG6sVsRiboG/CellBodydFs/",
        "dfCB", ToString[roi], ".txt"], "List"], {roi, 1, numROIsList[[n]]}],
    {n, 1, Length[dateMouseSessionList]}], 1];(*Cell body dF values*)

riboGcbSDs = StandardDeviation /@ cellbodyFs;
(*Cell body fluorescence standard deviation*)

riboGnpSDs = StandardDeviation /@ neuropilFs;(*Neuropil fluorescence standard deviation*)
```

```
cellBodydFsHists = Table[HistogramList[cellbodydFs[[n]], {0, 200, 1}, "Probability"][[2]],
   {n, 1, Length[cellbodydFs]}];(*List of cell body dF histograms*)

neuropildFsHists = Table[HistogramList[neuropildFs[[n]], {0, 200, 1}, "Probability"][[2]],
   {n, 1, Length[neuropildFs]}];(*List of neuropil dF histograms*)
```

In[ ]:=
```
cellBodyMedians = Median /@ cellbodydFs;
```

In[ ]:=
```
neuropilMedians = Median /@ neuropildFs;
```

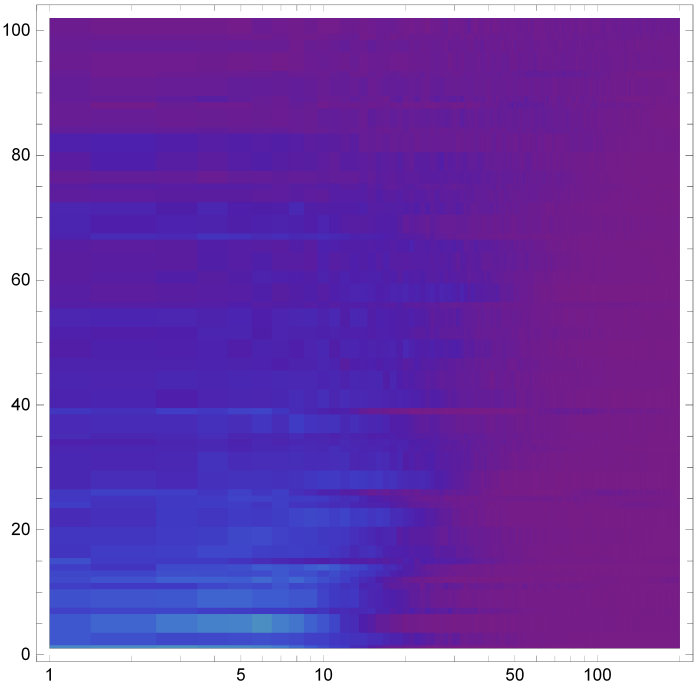
```
roiListCBmedSort =
  Part[#, 1] & /@ Sort[Table[{n, cellBodyMedians[[n]]}, {n, 1, Length[cellbodydFs]}],
    #1[[2]] < #2[[2]] &];(*Sort by median dF*)

roiListNPmedSort =
  Part[#, 1] & /@ Sort[Table[{n, neuropilMedians[[n]]}, {n, 1, Length[neuropildFs]}],
    #1[[2]] < #2[[2]] &];(*Sort by median dF*)
```

In[ ]:=
```
cellBodyDFhistArray = Table[cellBodydFsHists[[n]], {n, roiListCBmedSort}];
```

In[ ]:=
```
neuropilDFhistArray = Table[neuropildFsHists[[n]], {n, roiListNPmedSort}];
```

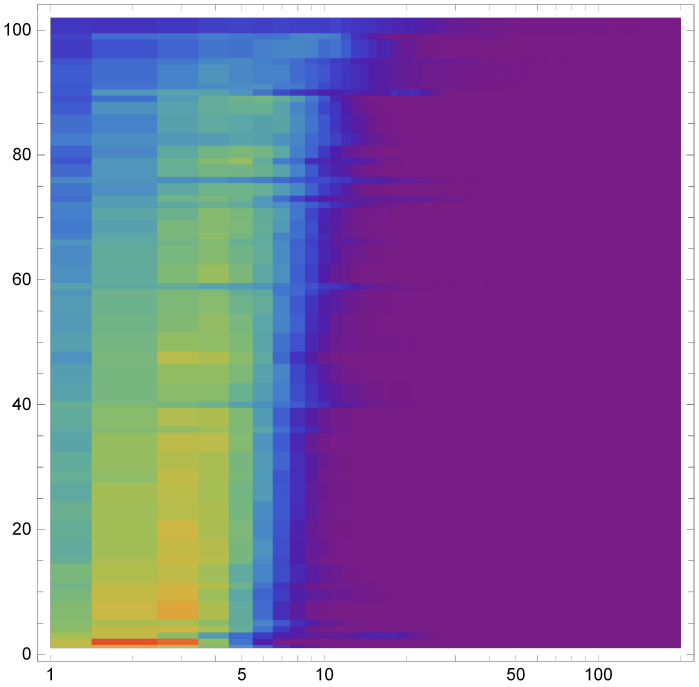
```
ListDensityPlot[cellBodyDFhistArray, InterpolationOrder → 0, ColorFunctionScaling → False,
 ColorFunction → (ColorData["Rainbow"]@Rescale[#, {0, 0.3}, {0, 1}] &), PlotRange → All,
 ScalingFunctions → {"Log", "Linear", "Linear"}](*Cell body dF histogram density plot*)
```

Out[ ]=



```
ListDensityPlot[neuropilDFhistArray, InterpolationOrder → 0, ColorFunctionScaling → False,
 ColorFunction → (ColorData["Rainbow"]@Rescale[#, {0, 0.3}, {0, 1}] &), PlotRange → All,
 ScalingFunctions → {"Log", "Linear", "Linear"}] (*Neuropil dF histogram density plot*)
```

Out[ ]=



In[ ]:=
```
(********************GCaMP6s data************************)
```

In[ ]:=
```
dateMouseSessionList = {{"021321", "Mouse23359", "Session1"},
    {"092620", "Mouse21069", "Session2"}, {"093020", "Mouse21069", "Session2"},
    {"111420", "Mouse23386", "Session3"}, {"111720", "Mouse23386", "Session3"}};
```

In[ ]:=
```
numROIsList =
  Table[Length[FileNames["*.txt", StringJoin["S:/Imaging/Garrett/FMB208_2PRig/",
      dateMouseSessionList[[n, 1]], "/", dateMouseSessionList[[n, 2]],
      "/", dateMouseSessionList[[n, 3]], "/ForG6sVsRiboG/NeuropilFs/"]]],
   {n, 1, Length[dateMouseSessionList]}];

neuropilFs = Flatten[
   Table[Table[ToExpression /@ Import[StringJoin["S:/Imaging/Garrett/FMB208_2PRig/",
       dateMouseSessionList[[n, 1]], "/", dateMouseSessionList[[n, 2]],
       "/", dateMouseSessionList[[n, 3]], "/ForG6sVsRiboG/NeuropilFs/",
       "fNP", ToString[roi], ".txt"], "List"], {roi, 1, numROIsList[[n]]}],
    {n, 1, Length[dateMouseSessionList]}], 1];(*Neuropil fluorescence values*)

neuropildFs = Flatten[
   Table[Table[ToExpression /@ Import[StringJoin["S:/Imaging/Garrett/FMB208_2PRig/",
       dateMouseSessionList[[n, 1]], "/", dateMouseSessionList[[n, 2]],
       "/", dateMouseSessionList[[n, 3]], "/ForG6sVsRiboG/NeuropildFs/",
       "dfNP", ToString[roi], ".txt"], "List"], {roi, 1, numROIsList[[n]]}],
    {n, 1, Length[dateMouseSessionList]}], 1];(*Neuropil dF values*)
```

```
cellbodyFs = Flatten[
   Table[Table[ToExpression /@ Import[StringJoin["S:/Imaging/Garrett/FMB208_2PRig/",
        dateMouseSessionList[[n, 1]], "/", dateMouseSessionList[[n, 2]],
        "/", dateMouseSessionList[[n, 3]], "/ForG6sVsRiboG/CellBodyFs/",
        "fCB", ToString[roi], ".txt"], "List"], {roi, 1, numROIsList[[n]]}],
    {n, 1, Length[dateMouseSessionList]}], 1];(*Cell body fluorescence values*)

cellbodydFs = Flatten[
   Table[Table[ToExpression /@ Import[StringJoin["S:/Imaging/Garrett/FMB208_2PRig/",
        dateMouseSessionList[[n, 1]], "/", dateMouseSessionList[[n, 2]],
        "/", dateMouseSessionList[[n, 3]], "/ForG6sVsRiboG/CellBodydFs/",
        "dfCB", ToString[roi], ".txt"], "List"], {roi, 1, numROIsList[[n]]}],
    {n, 1, Length[dateMouseSessionList]}], 1];(*Cell body dF values*)

g6ScbSDs = StandardDeviation /@ cellbodyFs;(*Cell body fluorescence standard deviation*)

g6SnpSDs = StandardDeviation /@ neuropilFs;(*Neuropil fluorescence standard deviation*)

cellBodydFsHists = Table[HistogramList[cellbodydFs[[n]], {0, 200, 1}, "Probability"][[2]],
   {n, 1, Length[cellbodydFs]}];(*List of cell body dF histograms*)

neuropildFsHists = Table[HistogramList[neuropildFs[[n]], {0, 200, 1}, "Probability"][[2]],
   {n, 1, Length[neuropildFs]}];(*List of neuropil dF histograms*)
```

In[•]:=
```
cellBodyMedians = Median /@ cellbodydFs;
```

In[•]:=
```
neuropilMedians = Median /@ neuropildFs;
```

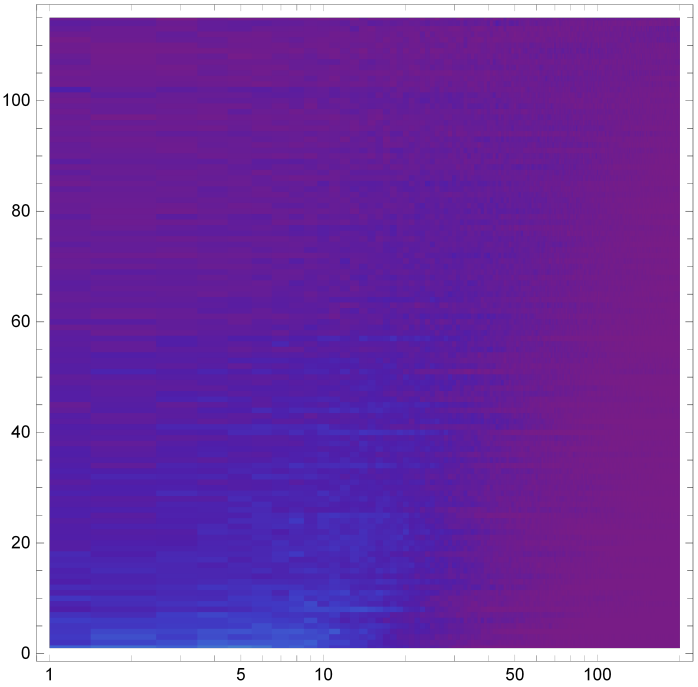
```
roiListCBmedSort =
  Part[#, 1] & /@ Sort[Table[{n, cellBodyMedians[[n]]}, {n, 1, Length[cellbodydFs]}],
    #1[[2]] < #2[[2]] &];(*Sort by median dF*)

roiListNPmedSort =
  Part[#, 1] & /@ Sort[Table[{n, neuropilMedians[[n]]}, {n, 1, Length[neuropildFs]}],
    #1[[2]] < #2[[2]] &];(*Sort by median dF*)
```

In[•]:=
```
cellBodyDFhistArray = Table[cellBodydFsHists[[n]], {n, roiListCBmedSort}];
```

In[•]:=
```
neuropilDFhistArray = Table[neuropildFsHists[[n]], {n, roiListNPmedSort}];
```

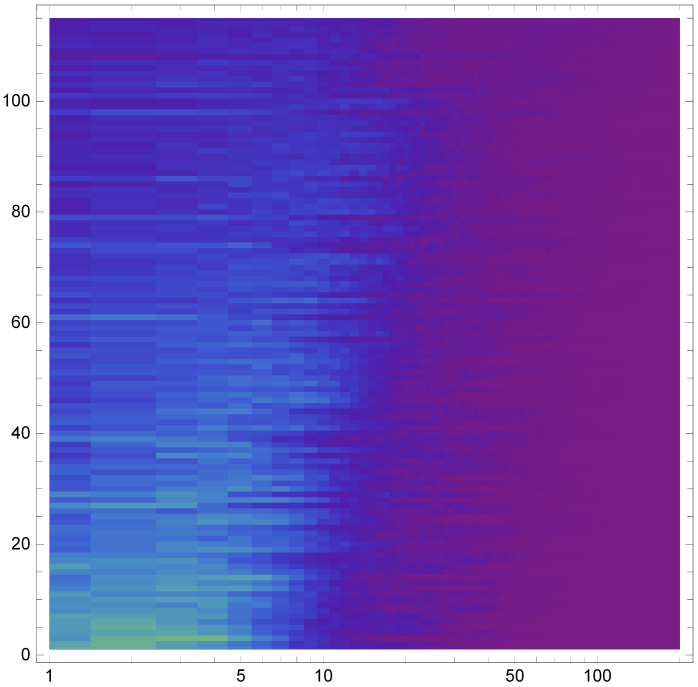
```
ListDensityPlot[cellBodyDFhistArray, InterpolationOrder → 0, ColorFunctionScaling → False,
 ColorFunction → (ColorData["Rainbow"]@Rescale[#, {0, 0.3}, {0, 1}] &), PlotRange → All,
 ScalingFunctions → {"Log", "Linear", "Linear"}] (*Cell body dF histogram density plot*)
```

Out[ ]=




```
ListDensityPlot[neuropilDFhistArray, InterpolationOrder → 0, ColorFunctionScaling → False,
 ColorFunction → (ColorData["Rainbow"]@Rescale[#, {0, 0.3}, {0, 1}] &), PlotRange → All,
 ScalingFunctions → {"Log", "Linear", "Linear"}] (*Neuropil dF histogram density plot*)
```

Out[ ]=



```
(*********************************************)
(*******Generate plot in Figure S5D,E****************)
(*********************************************)
```

In[•]:=
```
hfn = ($MachineEpsilon + #2) / Total[#2] &;
```

In[•]:=
```
h = Histogram[{g6ScbSDs, riboGcbSDs}, "Log", hfn,
    ChartStyle → (Directive[#, AbsoluteThickness[3]] & /@ {Black, Darker@Green}),
    PerformanceGoal → "Speed", PlotRange → {{0, 250}, {0, 0.5}}, FrameTicks →
     {{LinTicks[0, 0.5, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None},
      {LinTicks[0, 250, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None}},
    Frame → {{True, None}, {True, None}}, Axes → False,
    TicksStyle → Thick, FrameStyle → Thick];
```

In[•]:=
```
h2 = Histogram[{g6ScbSDs, riboGcbSDs}, "Log", hfn,
    ChartStyle → {{Black, Darker@Green}, Directive[Opacity[0.1], EdgeForm[]]},
    PlotRange → {{0, 250}, {0, 0.5}}, FrameTicks →
     {{LinTicks[0, 0.5, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None},
      {LinTicks[0, 250, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None}},
    Frame → {{True, None}, {True, None}}, Axes → False,
    TicksStyle → Thick, FrameStyle → Thick];
```

In[•]:=
```
hline = h /. rec : {({{_Rectangle}} | {}) ..} :→
     Line[Flatten[rec, 2] /. _[{x_, y_}, {X_, Y_}, ___] :→ Sequence[{x, Y}, {X, Y}]];
```

In[•]:=
```
g6Smedian = ListLogLinearPlot[{{Median[g6ScbSDs], 0.5}},
    PlotStyle → Black, PlotRange → {{0, 250}, {0, 0.5}}, FrameTicks →
     {{LinTicks[0, 0.5, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None},
      {LinTicks[0, 250, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None}},
    Frame → {{True, None}, {True, None}}, Axes → False,
    TicksStyle → Thick, FrameStyle → Thick];
```

In[•]:=
```
riboGmedian = ListLogLinearPlot[{{Median[riboGcbSDs], 0.5}},
    PlotStyle → Darker@Green, PlotRange → {{0, 250}, {0, 0.5}}, FrameTicks →
     {{LinTicks[0, 0.5, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None},
      {LinTicks[0, 250, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None}},
    Frame → {{True, None}, {True, None}}, Axes → False,
    TicksStyle → Thick, FrameStyle → Thick];
```

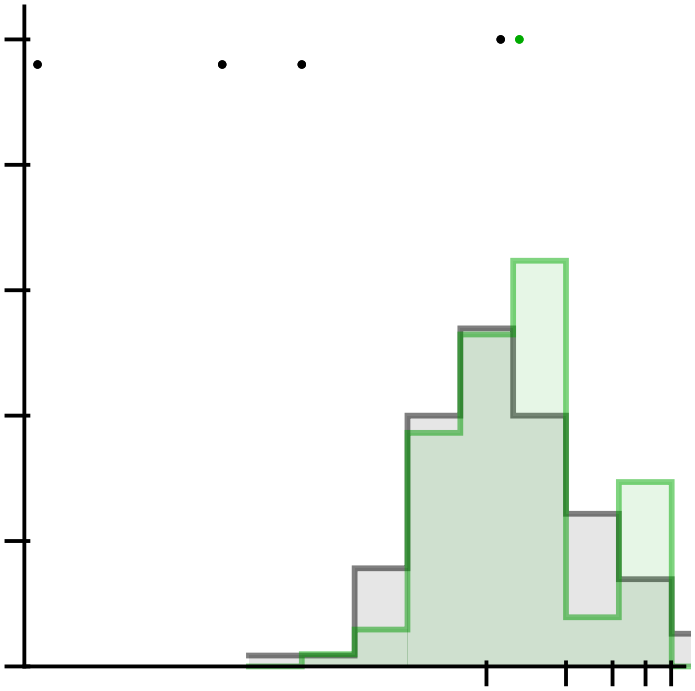
In[•]:=
```
mark1 = ListLogLinearPlot[{{1, 0.48}},
    PlotStyle → Black, PlotRange → {{0, 250}, {0, 0.5}}, FrameTicks →
     {{LinTicks[0, 0.5, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None},
      {LinTicks[0, 250, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None}},
    Frame → {{True, None}, {True, None}}, Axes → False,
    TicksStyle → Thick, FrameStyle → Thick];
```

In[•]:=
```
mark5 = ListLogLinearPlot[{{5, 0.48}},
    PlotStyle → Black, PlotRange → {{0, 250}, {0, 0.5}}, FrameTicks →
     {{LinTicks[0, 0.5, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None},
      {LinTicks[0, 250, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None}},
    Frame → {{True, None}, {True, None}}, Axes → False,
    TicksStyle → Thick, FrameStyle → Thick];
```

In[•]:=
```
mark10 = ListLogLinearPlot[{{10, 0.48}},
    PlotStyle → Black, PlotRange → {{0, 250}, {0, 0.5}}, FrameTicks →
     {{LinTicks[0, 0.5, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None},
      {LinTicks[0, 250, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None}},
    Frame → {{True, None}, {True, None}}, Axes → False,
    TicksStyle → Thick, FrameStyle → Thick];
```

In[•]:=
```
Show[hline, h2, g6Smedian, riboGmedian, mark1, mark5, mark10, AspectRatio → 1,
 FrameTicksStyle -> Directive[FontOpacity -> 0, FontSize -> 0]]
```

Out[•]=



In[•]:=
```
hfn = ($MachineEpsilon + #2) / Total[#2] &;
```

In[•]:=
```
h = Histogram[{g6SnpSDs, riboGnpSDs}, "Log", hfn,
    ChartStyle → (Directive[#, AbsoluteThickness[3]] & /@ {Gray, Green}),
    PerformanceGoal → "Speed", PlotRange → {{0, 250}, {0, 0.5}}, FrameTicks →
     {{LinTicks[0, 0.5, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None},
      {LinTicks[0, 250, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None}},
    Frame → {{True, None}, {True, None}}, Axes → False,
    TicksStyle → Thick, FrameStyle → Thick];
```

In[•]:=
```
h2 = Histogram[{g6SnpSDs, riboGnpSDs}, "Log", hfn,
    ChartStyle → {{Gray, Green}, Directive[Opacity[0.1], EdgeForm[]]},
    PlotRange → {{0, 250}, {0, 0.5}}, FrameTicks →
     {{LinTicks[0, 0.5, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None},
      {LinTicks[0, 250, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None}},
    Frame → {{True, None}, {True, None}}, Axes → False,
    TicksStyle → Thick, FrameStyle → Thick];
```

In[•]:=
```
hline = h /. rec : {({{_Rectangle}} | {}) ..} :→
     Line[Flatten[rec, 2] /. _[{x_, y_}, {X_, Y_}, ___] :→ Sequence[{x, Y}, {X, Y}]];
```

```
In[•]:= g6Smedian = ListLogLinearPlot[{{Median[g6SnpSDs], 0.5}},
          PlotStyle → Gray, PlotRange → {{0, 250}, {0, 0.5}}, FrameTicks →
           {{LinTicks[0, 0.5, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None},
            {LinTicks[0, 250, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None}},
          Frame → {{True, None}, {True, None}}, Axes → False,
          TicksStyle → Thick, FrameStyle → Thick];

In[•]:= riboGmedian = ListLogLinearPlot[{{Median[riboGnpSDs], 0.5}},
          PlotStyle → Green, PlotRange → {{0, 250}, {0, 0.5}}, FrameTicks →
           {{LinTicks[0, 0.5, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None},
            {LinTicks[0, 250, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None}},
          Frame → {{True, None}, {True, None}}, Axes → False,
          TicksStyle → Thick, FrameStyle → Thick];

In[•]:= mark1 = ListLogLinearPlot[{{1, 0.48}},
          PlotStyle → Black, PlotRange → {{0, 250}, {0, 0.5}}, FrameTicks →
           {{LinTicks[0, 0.5, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None},
            {LinTicks[0, 250, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None}},
          Frame → {{True, None}, {True, None}}, Axes → False,
          TicksStyle → Thick, FrameStyle → Thick];

In[•]:= mark5 = ListLogLinearPlot[{{5, 0.48}},
          PlotStyle → Black, PlotRange → {{0, 250}, {0, 0.5}}, FrameTicks →
           {{LinTicks[0, 0.5, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None},
            {LinTicks[0, 250, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None}},
          Frame → {{True, None}, {True, None}}, Axes → False,
          TicksStyle → Thick, FrameStyle → Thick];

In[•]:= mark10 = ListLogLinearPlot[{{10, 0.48}},
          PlotStyle → Black, PlotRange → {{0, 250}, {0, 0.5}}, FrameTicks →
           {{LinTicks[0, 0.5, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None},
            {LinTicks[0, 250, MajorTickLength → {0, .03}, MinorTickLength → {0, 0}], None}},
          Frame → {{True, None}, {True, None}}, Axes → False,
          TicksStyle → Thick, FrameStyle → Thick];
```

In[ ]:=
```
Show[hline, h2, g6Smedian, riboGmedian, mark1, mark5, mark10, AspectRatio → 1,
 FrameTicksStyle -> Directive[FontOpacity -> 0, FontSize -> 0]]
```

Out[ ]=