Brain

Isolated

BMAL

ZT 1

Welch Two Sample t-test

data: norm\_BMAL by treatment

t = 0.36071, df = 9.9796, p-value = 0.7258

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.2252885 0.3122913

sample estimates:

mean in group A mean in group LD

0.3017152 0.2582138

ZT 7

Welch Two Sample t-test

data: norm\_BMAL by treatment

t = 0.50419, df = 8.9053, p-value = 0.6264

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.2731686 0.4295310

sample estimates:

mean in group A mean in group LD

0.4754234 0.3972422

ZT 13

Welch Two Sample t-test

data: norm\_BMAL by treatment

t = 0.21979, df = 9.0571, p-value = 0.8309

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.3223710 0.3918291

sample estimates:

mean in group A mean in group LD

0.4770703 0.4423412

ZT 19

Welch Two Sample t-test

data: norm\_BMAL by treatment

t = -0.0887, df = 7.8774, p-value = 0.9315

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.2028487 0.1878607

sample estimates:

mean in group A mean in group LD

0.1900048 0.1974987

CRY

ZT 1

Welch Two Sample t-test

data: norm\_CRY by treatment

t = -0.39788, df = 6.8829, p-value = 0.7028

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.2820164 0.2010187

sample estimates:

mean in group A mean in group LD

0.5385600 0.5790589

ZT 7

Welch Two Sample t-test

data: norm\_CRY by treatment

t = 0.063414, df = 8.7781, p-value = 0.9509

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.3409470 0.3605355

sample estimates:

mean in group A mean in group LD

0.6305600 0.6207658

ZT 13

Welch Two Sample t-test

data: norm\_CRY by treatment

t = -0.045237, df = 13.924, p-value = 0.9646

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.2184206 0.2094018

sample estimates:

mean in group A mean in group LD

0.3272822 0.3317916

ZT 19

Welch Two Sample t-test

data: norm\_CRY by treatment

t = 1.0981, df = 9.6487, p-value = 0.2988

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.04404892 0.12883392

sample estimates:

mean in group A mean in group LD

0.14017091 0.09777841

PER2

ZT 1

Welch Two Sample t-test

data: norm\_PER2 by treatment

t = 0.23836, df = 2.2467, p-value = 0.8316

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.5932980 0.6709644

sample estimates:

mean in group A mean in group LD

0.4006061 0.3617729

ZT 7

Welch Two Sample t-test

data: norm\_PER2 by treatment

t = -0.28305, df = 4.8129, p-value = 0.7889

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.1633218 0.1312629

sample estimates:

mean in group A mean in group LD

0.1362147 0.1522441

ZT 13

Welch Two Sample t-test

data: norm\_PER2 by treatment

t = 1.5253, df = 4.6445, p-value = 0.1921

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.03031931 0.11397298

sample estimates:

mean in group A mean in group LD

0.06903320 0.02720636

ZT 19

Welch Two Sample t-test

data: norm\_PER2 by treatment

t = 1.3888, df = 4.7295, p-value = 0.2267

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.03100852 0.10122353

sample estimates:

mean in group A mean in group LD

0.08390097 0.04879346

PER3

ZT 1

Welch Two Sample t-test

data: norm\_PER3 by treatment

t = -2.4777, df = 9.9025, p-value = 0.03289

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.4954939 -0.0259479

sample estimates:

mean in group A mean in group LD

0.4527591 0.7134799

ZT 7

Welch Two Sample t-test

data: norm\_PER3 by treatment

t = -0.25917, df = 8.9139, p-value = 0.8014

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.07468489 0.05935117

sample estimates:

mean in group A mean in group LD

0.07328492 0.08095177

ZT 13

Welch Two Sample t-test

data: norm\_PER3 by treatment

t = 0.18669, df = 13.939, p-value = 0.8546

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.02480174 0.02952897

sample estimates:

mean in group A mean in group LD

0.04290018 0.04053656

ZT 19

Welch Two Sample t-test

data: norm\_PER3 by treatment

t = 0.51668, df = 9.5501, p-value = 0.6171

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.2593593 0.4146606

sample estimates:

mean in group A mean in group LD

0.5618504 0.4841997

SOCIAL

BMAL

ZT 1

Welch Two Sample t-test

data: norm\_BMAL by treatment

t = -0.93242, df = 9.3447, p-value = 0.3746

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.3142969 0.1300955

sample estimates:

mean in group SA mean in group SLD

0.2325063 0.3246070

ZT 7

Welch Two Sample t-test

data: norm\_BMAL by treatment

t = 1.1166, df = 7.2677, p-value = 0.2997

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.1688950 0.4754224

sample estimates:

mean in group SA mean in group SLD

0.5853749 0.4321112

ZT 13

Welch Two Sample t-test

data: norm\_BMAL by treatment

t = -3.2953, df = 6.6058, p-value = 0.01435

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.54828869 -0.08691178

sample estimates:

mean in group SA mean in group SLD

0.2981732 0.6157734

ZT 19

Welch Two Sample t-test

data: norm\_BMAL by treatment

t = -2.1306, df = 6.2667, p-value = 0.0752

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.48585822 0.03109034

sample estimates:

mean in group SA mean in group SLD

0.182593 0.409977

CRY

ZT 1

Welch Two Sample t-test

data: norm\_CRY by treatment

t = -0.25248, df = 9.8903, p-value = 0.8058

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.3220530 0.2565836

sample estimates:

mean in group SA mean in group SLD

0.4659153 0.4986500

ZT 7

Welch Two Sample t-test

data: norm\_CRY by treatment

t = -1.1111, df = 8.9989, p-value = 0.2953

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.4195868 0.1431840

sample estimates:

mean in group SA mean in group SLD

0.4728810 0.6110824

ZT 13

Welch Two Sample t-test

data: norm\_CRY by treatment

t = -1.2848, df = 9.9502, p-value = 0.228

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.4505923 0.1211436

sample estimates:

mean in group SA mean in group SLD

0.3228642 0.4875886

ZT 19

Welch Two Sample t-test

data: norm\_CRY by treatment

t = -0.59742, df = 7.7622, p-value = 0.5672

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.2364805 0.1395740

sample estimates:

mean in group SA mean in group SLD

0.09374856 0.14220182

PER2

ZT 1

Welch Two Sample t-test

data: norm\_PER2 by treatment

t = -1.4849, df = 4.3116, p-value = 0.2067

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.7660673 0.2223156

sample estimates:

mean in group SA mean in group SLD

0.3984363 0.6703121

ZT 7

Welch Two Sample t-test

data: norm\_PER2 by treatment

t = -1.2168, df = 5.0173, p-value = 0.2778

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.2801498 0.1000141

sample estimates:

mean in group SA mean in group SLD

0.1080768 0.1981446

ZT 13

Welch Two Sample t-test

data: norm\_PER2 by treatment

t = -0.43448, df = 5.3304, p-value = 0.681

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.12249273 0.08650682

sample estimates:

mean in group SA mean in group SLD

0.04259314 0.06058609

ZT 19

Welch Two Sample t-test

data: norm\_PER2 by treatment

t = 0.30378, df = 5.0419, p-value = 0.7734

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.1242901 0.1576977

sample estimates:

mean in group SA mean in group SLD

0.1201416 0.1034378

PER3

ZT 1

Welch Two Sample t-test

data: norm\_PER3 by treatment

t = -2.4227, df = 8.4401, p-value = 0.04015

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.57486886 -0.01678905

sample estimates:

mean in group SA mean in group SLD

0.3921242 0.6879531

ZT 7

Welch Two Sample t-test

data: norm\_PER3 by treatment

t = 0.45177, df = 5.19, p-value = 0.6697

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.08811981 0.12620103

sample estimates:

mean in group SA mean in group SLD

0.09393572 0.07489511

ZT 13

Welch Two Sample t-test

data: norm\_PER3 by treatment

t = 0.3003, df = 8.0271, p-value = 0.7716

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.05878151 0.07639503

sample estimates:

mean in group SA mean in group SLD

0.06506883 0.05626208

ZT 19

Welch Two Sample t-test

data: norm\_PER3 by treatment

t = 1.3974, df = 6.613, p-value = 0.2074

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.0952499 0.3626482

sample estimates:

mean in group SA mean in group SLD

0.4592932 0.3255940

Circacompare Rhythmicity

BMAL

Isolated

$summary

parameter value

1 **Presence of rhythmicity (p-value) for A 0.01301395**

**2 Presence of rhythmicity (p-value) for LD 0.08476978**

3 A mesor estimate 0.36294270

4 LD mesor estimate 0.32719725

5 Mesor difference estimate -0.03574546

6 P-value for mesor difference 0.60237738

7 A amplitude estimate 0.16949975

8 LD amplitude estimate 0.13704062

9 Amplitude difference estimate -0.03245913

10 P-value for amplitude difference 0.74102843

11 A peak time hours 9.17693437

12 LD peak time hours 9.88108293

13 Phase difference estimate 0.70414856

14 P-value for difference in phase 0.77498858

15 Shared period estimate 24.00000000

$fit

Nonlinear regression model

model: measure ~ (k + k1 \* x\_group) + ((alpha + alpha1 \* x\_group)) \* cos((1/period) \* time\_r - ((phi + phi1 \* x\_group)))

data: x

k k1 alpha alpha1 phi phi1

0.36294 -0.03575 0.16950 -0.03246 2.40252 0.18435

residual sum-of-squares: 2.417

Number of iterations to convergence: 6

Achieved convergence tolerance: 4.211e-09

**BMAL**

**Social**

**$summary**

**parameter value**

**1 Presence of rhythmicity (p-value) for SA 0.0004141332**

**2 Presence of rhythmicity (p-value) for SLD 0.0300518545**

3 SA mesor estimate 0.3196487063

4 SLD mesor estimate 0.4466855359

5 Mesor difference estimate 0.1270368297

6 P-value for mesor difference 0.0255980486

7 SA amplitude estimate 0.1990140542

8 SLD amplitude estimate 0.1481338536

9 Amplitude difference estimate -0.0508802005

10 P-value for amplitude difference 0.5178749720

11 SA peak time hours 7.7145203792

12 SLD peak time hours 12.7143686010

13 Phase difference estimate 4.9998482217

14 **P-value for difference in phase 0.0077450043**

15 Shared period estimate 24.0000000000

$fit

Nonlinear regression model

model: measure ~ (k + k1 \* x\_group) + ((alpha + alpha1 \* x\_group)) \* cos((1/period) \* time\_r - ((phi + phi1 \* x\_group)))

data: x

k k1 alpha alpha1 phi phi1

0.31965 0.12704 0.19901 -0.05088 2.01966 1.30896

residual sum-of-squares: 1.301

Number of iterations to convergence: 9

Achieved convergence tolerance: 7.457e-07

**CRY**

**Isolated**

$summary

parameter value

1 Presence of rhythmicity (p-value) for **A 2.893701e-04**

2 Presence of rhythmicity (p-value) for **LD 1.797823e-06**

3 A mesor estimate 4.107285e-01

4 LD mesor estimate 4.125847e-01

5 Mesor difference estimate 1.856255e-03

6 P-value for mesor difference 9.721031e-01

7 A amplitude estimate 2.657446e-01

8 LD amplitude estimate 2.880385e-01

9 Amplitude difference estimate 2.229393e-02

10 P-value for amplitude difference 7.737434e-01

11 A peak time hours 5.487974e+00

12 LD peak time hours 5.347262e+00

13 Phase difference estimate -1.407120e-01

14 P-value for difference in phase 8.892151e-01

15 Shared period estimate 2.400000e+01

$fit

Nonlinear regression model

model: measure ~ (k + k1 \* x\_group) + ((alpha + alpha1 \* x\_group)) \* cos((1/period) \* time\_r - ((phi + phi1 \* x\_group)))

data: x

k k1 alpha alpha1 phi phi1

0.410728 0.001856 0.265745 0.022294 1.436748 -0.036838

residual sum-of-squares: 1.724

Number of iterations to convergence: 5

Achieved convergence tolerance: 2.144e-08

**Social**

$summary

parameter value

1 Presence of rhythmicity (p-value) for SA 0.007029892

2 Presence of rhythmicity (p-value) for SLD 0.001436656

3 SA mesor estimate 0.345934242

4 SLD mesor estimate 0.434880698

5 Mesor difference estimate 0.088946456

6 P-value for mesor difference 0.167072411

7 SA amplitude estimate 0.203956743

8 SLD amplitude estimate 0.229145996

9 Amplitude difference estimate 0.025189253

10 P-value for amplitude difference 0.784837031

11 SA peak time hours 5.556547462

12 SLD peak time hours 6.996061643

13 Phase difference estimate 1.439514181

14 P-value for difference in phase 0.357313712

15 Shared period estimate 24.000000000

$fit

Nonlinear regression model

model: measure ~ (k + k1 \* x\_group) + ((alpha + alpha1 \* x\_group)) \* cos((1/period) \* time\_r - ((phi + phi1 \* x\_group)))

data: x

k k1 alpha alpha1 phi phi1

0.34593 0.08895 0.20396 0.02519 1.45470 0.37686

residual sum-of-squares: 1.74

Number of iterations to convergence: 5

Achieved convergence tolerance: 1.004e-08

Warning message:

Removed 1 rows containing missing values (`geom\_point()`).

**PER2**

**Isolated**

$summary

parameter value

1 Presence of rhythmicity (p-value) for **A 1.072424e-02**

2 Presence of rhythmicity (p-value) for **LD 1.996834e-05**

3 A mesor estimate 1.676402e-01

4 LD mesor estimate 1.450313e-01

5 Mesor difference estimate -2.260891e-02

6 P-value for mesor difference 5.712656e-01

7 A amplitude estimate 1.583645e-01

8 LD amplitude estimate 1.766220e-01

9 Amplitude difference estimate 1.825747e-02

10 P-value for amplitude difference 7.526037e-01

11 A peak time hours 1.633802e+00

12 LD peak time hours 2.247668e+00

13 Phase difference estimate 6.138659e-01

14 P-value for difference in phase 6.258421e-01

15 Shared period estimate 2.400000e+01

$fit

Nonlinear regression model

model: measure ~ (k + k1 \* x\_group) + ((alpha + alpha1 \* x\_group)) \* cos((1/period) \* time\_r - ((phi + phi1 \* x\_group)))

data: x

k k1 alpha alpha1 phi phi1

0.16764 -0.02261 0.15836 0.01826 0.42773 0.16071

residual sum-of-squares: 0.3194

Number of iterations to convergence: 4

Achieved convergence tolerance: 7.121e-08

**Social**

$summary

parameter value

1 Presence of rhythmicity (p-value) for SA 1.037858e-04

2 Presence of rhythmicity (p-value) for SLD 1.484727e-03

3 SA mesor estimate 1.645118e-01

4 SLD mesor estimate 2.581201e-01

5 Mesor difference estimate 9.360835e-02

6 P-value for mesor difference 1.590160e-01

7 SA amplitude estimate 1.783014e-01

8 SLD amplitude estimate 3.222870e-01

9 Amplitude difference estimate 1.439856e-01

10 P-value for amplitude difference 1.311180e-01

11 SA peak time hours 7.506176e-01

12 SLD peak time hours 1.706591e+00

13 Phase difference estimate 9.559733e-01

14 P-value for difference in phase 5.450353e-01

15 Shared period estimate 2.400000e+01

$fit

Nonlinear regression model

model: measure ~ (k + k1 \* x\_group) + ((alpha + alpha1 \* x\_group)) \* cos((1/period) \* time\_r - ((phi + phi1 \* x\_group)))

data: x

k k1 alpha alpha1 phi phi1

0.16451 0.09361 0.17830 0.14399 0.19651 0.25027

residual sum-of-squares: 1.053

Number of iterations to convergence: 4

Achieved convergence tolerance: 1.132e-07

**PER3**

**Isolated**

$summary

parameter value

1 Presence of rhythmicity (p-value) for A 3.316211e-07

2 Presence of rhythmicity (p-value) for LD 2.871359e-09

3 A mesor estimate 2.803740e-01

4 LD mesor estimate 3.329398e-01

5 Mesor difference estimate 5.256572e-02

6 P-value for mesor difference 2.359415e-01

7 A amplitude estimate 3.218653e-01

8 LD amplitude estimate 3.868702e-01

9 Amplitude difference estimate 6.500490e-02

10 P-value for amplitude difference 2.965448e-01

11 A peak time hours 2.170850e+01

12 LD peak time hours 2.290596e+01

13 Phase difference estimate 1.197466e+00

14 P-value for difference in phase 8.403655e-02

15 Shared period estimate 2.400000e+01

$fit

Nonlinear regression model

model: measure ~ (k + k1 \* x\_group) + ((alpha + alpha1 \* x\_group)) \* cos((1/period) \* time\_r - ((phi + phi1 \* x\_group)))

data: x

k k1 alpha alpha1 phi phi1

0.28037 0.05257 0.32187 0.06500 5.68327 0.31350

residual sum-of-squares: 1.133

Number of iterations to convergence: 6

Achieved convergence tolerance: 1.886e-08

**Social**

$summary

parameter value

1 Presence of rhythmicity (p-value) for SA 3.458451e-05

2 Presence of rhythmicity (p-value) for SLD 2.400124e-07

3 SA mesor estimate 2.505765e-01

4 SLD mesor estimate 2.861761e-01

5 Mesor difference estimate 3.559954e-02

6 P-value for mesor difference 4.342779e-01

7 SA amplitude estimate 2.458315e-01

8 SLD amplitude estimate 3.355840e-01

9 Amplitude difference estimate 8.975252e-02

10 P-value for amplitude difference 1.685030e-01

11 SA peak time hours 2.174481e+01

12 SLD peak time hours 2.344143e+01

13 Phase difference estimate 1.696613e+00

14 P-value for difference in **phase 5.495695e-02**

15 Shared period estimate 2.400000e+01

$fit

Nonlinear regression model

model: measure ~ (k + k1 \* x\_group) + ((alpha + alpha1 \* x\_group)) \* cos((1/period) \* time\_r - ((phi + phi1 \* x\_group)))

data: x

k k1 alpha alpha1 phi phi1

0.25058 0.03560 0.24583 0.08975 5.69278 0.44417

residual sum-of-squares: 0.9256

Number of iterations to convergence: 7

Achieved convergence tolerance: 4.57e-08

**Liver**

BMAL

Isolated

$plot

$summary

parameter value

1 Presence of rhythmicity (p-value) for **A 1.232283e-03**

2 Presence of rhythmicity (p-value) for **LD 1.824887e-04**

3 A mesor estimate 2.368904e-01

4 LD mesor estimate 2.371161e-01

5 Mesor difference estimate 2.257066e-04

6 P-value for mesor difference 9.972590e-01

7 A amplitude estimate 2.337409e-01

8 LD amplitude estimate 2.818315e-01

9 Amplitude difference estimate 4.809068e-02

10 P-value for amplitude difference 5.961281e-01

11 A peak time hours 1.116053e+01

12 LD peak time hours 1.179443e+01

13 Phase difference estimate 6.338952e-01

14 P-value for difference in phase 6.592908e-01

15 Shared period estimate 2.400000e+01

$fit

Nonlinear regression model

model: measure ~ (k + k1 \* x\_group) + ((alpha + alpha1 \* x\_group)) \* cos((1/period) \* time\_r - ((phi + phi1 \* x\_group)))

data: x

k k1 alpha alpha1 phi phi1

0.2368904 0.0002257 0.2337409 0.0480907 2.9218211 0.1659534

residual sum-of-squares: 2.543

Number of iterations to convergence: 8

Achieved convergence tolerance: 2.628e-06

Warning message:

Removed 1 rows containing missing values (`geom\_point()`).

Social

$plot

$summary

parameter value

1 Presence of rhythmicity (p-value) for **SA 6.482347e-04**

2 Presence of rhythmicity (p-value) for **SLD 4.811930e-06**

3 SA mesor estimate 2.067345e-01

4 SLD mesor estimate 3.089286e-01

5 Mesor difference estimate 1.021941e-01

6 P-value for mesor difference 8.495302e-02

7 SA amplitude estimate 2.404691e-01

8 SLD amplitude estimate 3.504398e-01

9 Amplitude difference estimate 1.099708e-01

10 P-value for amplitude difference 1.821439e-01

11 SA peak time hours 9.906438e+00

12 SLD peak time hours 1.072304e+01

13 Phase difference estimate 8.166015e-01

14 P-value for difference in phase 4.649006e-01

15 Shared period estimate 2.400000e+01

$fit

Nonlinear regression model

model: measure ~ (k + k1 \* x\_group) + ((alpha + alpha1 \* x\_group)) \* cos((1/period) \* time\_r - ((phi + phi1 \* x\_group)))

data: x

k k1 alpha alpha1 phi phi1

0.2067 0.1022 0.2405 0.1100 2.5935 0.2138

residual sum-of-squares: 1.31

Number of iterations to convergence: 7

Achieved convergence tolerance: 1.487e-08

Warning message:

Removed 3 rows containing missing values (`geom\_point()`).

CRY

Isolated

$plot

$summary

parameter value

1 Presence of rhythmicity (p-value) for **A 1.703300e-04**

2 Presence of rhythmicity (p-value) for **LD 5.870427e-06**

3 A mesor estimate 3.408933e-01

4 LD mesor estimate 3.673770e-01

5 Mesor difference estimate 2.648370e-02

6 P-value for mesor difference 6.299792e-01

7 A amplitude estimate 2.589402e-01

8 LD amplitude estimate 3.207467e-01

9 Amplitude difference estimate 6.180646e-02

10 P-value for amplitude difference 4.422024e-01

11 A peak time hours 7.660681e+00

12 LD peak time hours 8.278661e+00

13 Phase difference estimate 6.179807e-01

14 P-value for difference in phase 5.446408e-01

15 Shared period estimate 2.400000e+01

$fit

Nonlinear regression model

model: measure ~ (k + k1 \* x\_group) + ((alpha + alpha1 \* x\_group)) \* cos((1/period) \* time\_r - ((phi + phi1 \* x\_group)))

data: x

k k1 alpha alpha1 phi phi1

0.34089 0.02648 0.25894 0.06181 2.00556 0.16179

residual sum-of-squares: 1.776

Number of iterations to convergence: 5

Achieved convergence tolerance: 2.679e-08

Warning message:

Removed 1 rows containing missing values (`geom\_point()`).

Social

$plot

$summary

parameter value

1 Presence of rhythmicity (p-value) for SA 1.129818e-04

2 Presence of rhythmicity (p-value) for SLD 9.139442e-06

3 SA mesor estimate 3.164151e-01

4 SLD mesor estimate 3.477226e-01

5 Mesor difference estimate 3.130756e-02

6 P-value for mesor difference 5.440681e-01

7 SA amplitude estimate 2.575206e-01

8 SLD amplitude estimate 3.034049e-01

9 Amplitude difference estimate 4.588431e-02

10 P-value for amplitude difference 5.370720e-01

11 SA peak time hours 7.134035e+00

12 SLD peak time hours 8.622527e+00

13 Phase difference estimate 1.488492e+00

14 P-value for difference in phase 1.339461e-01

15 Shared period estimate 2.400000e+01

$fit

Nonlinear regression model

model: measure ~ (k + k1 \* x\_group) + ((alpha + alpha1 \* x\_group)) \* cos((1/period) \* time\_r - ((phi + phi1 \* x\_group)))

data: x

k k1 alpha alpha1 phi phi1

0.31642 0.03131 0.25752 0.04588 1.86769 0.38969

residual sum-of-squares: 1.086

Number of iterations to convergence: 9

Achieved convergence tolerance: 3.09e-08

Warning message:

Removed 2 rows containing missing values (`geom\_point()`).

PER2

Isolated

$plot

$summary

parameter value

1 Presence of rhythmicity (p-value) for A 4.200057e-04

2 Presence of rhythmicity (p-value) for LD 4.459028e-06

3 A mesor estimate 1.923486e-01

4 LD mesor estimate 2.586360e-01

5 Mesor difference estimate 6.628735e-02

6 P-value for mesor difference 2.448054e-01

7 A amplitude estimate 2.564717e-01

8 LD amplitude estimate 3.911100e-01

9 Amplitude difference estimate 1.346383e-01

10 P-value for amplitude difference 9.824006e-02

11 A peak time hours 2.149083e+00

12 LD peak time hours 2.419475e+00

13 Phase difference estimate 2.703912e-01

14 P-value for difference in phase 7.896262e-01

15 Shared period estimate 2.400000e+01

$fit

Nonlinear regression model

model: measure ~ (k + k1 \* x\_group) + ((alpha + alpha1 \* x\_group)) \* cos((1/period) \* time\_r - ((phi + phi1 \* x\_group)))

data: x

k k1 alpha alpha1 phi phi1

0.19235 0.06629 0.25647 0.13464 0.56263 0.07079

residual sum-of-squares: 0.7341

Number of iterations to convergence: 3

Achieved convergence tolerance: 2.837e-08

Warning message:

Removed 19 rows containing missing values (`geom\_point()`).

Social

$plot

$summary

parameter value

1 Presence of rhythmicity (p-value) for SA 4.220878e-04

2 Presence of rhythmicity (p-value) for SLD 1.768907e-05

3 SA mesor estimate 1.701870e-01

4 SLD mesor estimate 2.261265e-01

5 Mesor difference estimate 5.593951e-02

6 P-value for mesor difference 3.750263e-01

7 SA amplitude estimate 2.996221e-01

8 SLD amplitude estimate 3.685301e-01

9 Amplitude difference estimate 6.890804e-02

10 P-value for amplitude difference 4.357999e-01

11 SA peak time hours 1.109941e+00

12 SLD peak time hours 2.017219e+00

13 Phase difference estimate 9.072776e-01

14 P-value for difference in phase 3.776674e-01

15 Shared period estimate 2.400000e+01

$fit

Nonlinear regression model

model: measure ~ (k + k1 \* x\_group) + ((alpha + alpha1 \* x\_group)) \* cos((1/period) \* time\_r - ((phi + phi1 \* x\_group)))

data: x

k k1 alpha alpha1 phi phi1

0.17019 0.05594 0.29962 0.06891 0.29058 0.23752

residual sum-of-squares: 0.8968

Number of iterations to convergence: 4

Achieved convergence tolerance: 3.793e-07

Warning message:

Removed 12 rows containing missing values (`geom\_point()`).

PER3

Isolated

$plot

$summary

parameter value

1 Presence of rhythmicity (p-value) for A 7.012042e-04

2 Presence of rhythmicity (p-value) for LD 8.630173e-07

3 A mesor estimate 1.089224e-01

4 LD mesor estimate 8.532652e-02

5 Mesor difference estimate -2.359586e-02

6 P-value for mesor difference 3.580907e-01

7 A amplitude estimate 1.342116e-01

8 LD amplitude estimate 9.369788e-02

9 Amplitude difference estimate -4.051369e-02

10 P-value for amplitude difference 2.616105e-01

11 A peak time hours 2.160393e+01

12 LD peak time hours 2.297523e+01

13 Phase difference estimate 1.371293e+00

14 P-value for difference in phase 2.896852e-01

15 Shared period estimate 2.400000e+01

$fit

Nonlinear regression model

model: measure ~ (k + k1 \* x\_group) + ((alpha + alpha1 \* x\_group)) \* cos((1/period) \* time\_r - ((phi + phi1 \* x\_group)))

data: x

k k1 alpha alpha1 phi phi1

0.10892 -0.02360 0.13421 -0.04051 5.65590 0.35900

residual sum-of-squares: 0.3847

Number of iterations to convergence: 7

Achieved convergence tolerance: 1.351e-07

Warning message:

Removed 1 rows containing missing values (`geom\_point()`).

Social

$plot

$summary

parameter value

1 Presence of rhythmicity (p-value) for SA 3.706409e-04

2 Presence of rhythmicity (p-value) for SLD 2.114278e-05

3 SA mesor estimate 1.432457e-01

4 SLD mesor estimate 8.756425e-02

5 Mesor difference estimate -5.568142e-02

6 P-value for mesor difference 1.873140e-01

7 SA amplitude estimate 2.299033e-01

8 SLD amplitude estimate 1.117425e-01

9 Amplitude difference estimate -1.181608e-01

10 **P-value for amplitude difference 5.132489e-02**

11 SA peak time hours 2.025491e+01

12 SLD peak time hours 2.325636e+01

13 Phase difference estimate 3.001450e+00

14 P-value for difference in phase 7.023210e-02

15 Shared period estimate 2.400000e+01

$fit

Nonlinear regression model

model: measure ~ (k + k1 \* x\_group) + ((alpha + alpha1 \* x\_group)) \* cos((1/period) \* time\_r - ((phi + phi1 \* x\_group)))

data: x

k k1 alpha alpha1 phi phi1

0.14325 -0.05568 0.22990 -0.11816 -0.98046 0.78578

residual sum-of-squares: 0.7143

Number of iterations to convergence: 6

Achieved convergence tolerance: 2.937e-09

Warning message:

Removed 2 rows containing missing values (`geom\_point()`).

Time points

BMAL

Islated

ZT 1

Welch Two Sample t-test

data: norm\_L\_BMAL by treatment

t = 0.95476, df = 6.9576, p-value = 0.3717

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.08751421 0.20579752

sample estimates:

mean in group A mean in group LD

0.11574650 0.05660484

ZT 7

Welch Two Sample t-test

data: norm\_L\_BMAL by treatment

t = 0.23235, df = 9.6233, p-value = 0.8211

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.3154321 0.3884421

sample estimates:

mean in group A mean in group LD

0.259138 0.222633

ZT 13

Welch Two Sample t-test

data: norm\_L\_BMAL by treatment

t = -0.40583, df = 12.633, p-value = 0.6917

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.4039775 0.2765221

sample estimates:

mean in group A mean in group LD

0.5177732 0.5815009

ZT 19

Welch Two Sample t-test

data: norm\_L\_BMAL by treatment

t = -0.15453, df = 9.8802, p-value = 0.8803

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.07808262 0.06796976

sample estimates:

mean in group A mean in group LD

0.04261360 0.04767003

CRY

ZT 1

Welch Two Sample t-test

data: norm\_L\_CRY by treatment

t = 0.46338, df = 7.4001, p-value = 0.6564

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.2329157 0.3480033

sample estimates:

mean in group A mean in group LD

0.3497116 0.2921678

ZT 7

Welch Two Sample t-test

data: norm\_L\_CRY by treatment

t = -0.64121, df = 9.8964, p-value = 0.536

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.4145529 0.2294780

sample estimates:

mean in group A mean in group LD

0.5425866 0.6351240

ZT 13

Welch Two Sample t-test

data: norm\_L\_CRY by treatment

t = -0.66742, df = 10.062, p-value = 0.5195

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.2945456 0.1586752

sample estimates:

mean in group A mean in group LD

0.4312151 0.4991503

ZT 19

Welch Two Sample t-test

data: norm\_L\_CRY by treatment

t = 0.22091, df = 8.8094, p-value = 0.8302

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.02962725 0.03601660

sample estimates:

mean in group A mean in group LD

0.03243368 0.02923900

PER2

ZT 1

Welch Two Sample t-test

data: norm\_L\_PER2 by treatment

t = -1.4649, df = 6.1396, p-value = 0.1922

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.5132837 0.1275223

sample estimates:

mean in group A mean in group LD

0.5259339 0.7188146

ZT 7

Welch Two Sample t-test

data: norm\_L\_PER2 by treatment

t = -0.97546, df = 5.5953, p-value = 0.3696

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.3597086 0.1572335

sample estimates:

mean in group A mean in group LD

0.1797130 0.2809505

ZT 13

Welch Two Sample t-test

data: norm\_L\_PER2 by treatment

t = 0.7722, df = 3.4688, p-value = 0.4892

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.06238854 0.10658231

sample estimates:

mean in group A mean in group LD

0.03602609 0.01392921

ZT 19

Welch Two Sample t-test

data: norm\_L\_PER2 by treatment

t = 0.70571, df = 5.4884, p-value = 0.5092

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.01750409 0.03124795

sample estimates:

mean in group A mean in group LD

0.02772158 0.02084965

PER3

ZT 1

Welch Two Sample t-test

data: norm\_L\_PER3 by treatment

t = 0.14363, df = 9.4292, p-value = 0.8888

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.06967752 0.07919528

sample estimates:

mean in group A mean in group LD

0.1679607 0.1632018

ZT 7

Welch Two Sample t-test

data: norm\_L\_PER3 by treatment

t = -0.55487, df = 9.9611, p-value = 0.5912

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.05605581 0.03371267

sample estimates:

mean in group A mean in group LD

0.03023864 0.04141021

ZT 13

Welch Two Sample t-test

data: norm\_L\_PER3 by treatment

t = 0.57863, df = 11.692, p-value = 0.5738

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.001596871 0.002747141

sample estimates:

mean in group A mean in group LD

0.002469029 0.001893894

ZT 19

Welch Two Sample t-test

data: norm\_L\_PER3 by treatment

t = 0.993, df = 6.6745, p-value = 0.3553

alternative hypothesis: true difference in means between group A and group LD is not equal to 0

95 percent confidence interval:

-0.1440294 0.3490490

sample estimates:

mean in group A mean in group LD

0.2386685 0.1361586

SOCIAL

BMAL

ZT 1

Welch Two Sample t-test

data: norm\_L\_BMAL by treatment

t = -0.31557, df = 8.9999, p-value = 0.7595

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.05210624 0.03934838

sample estimates:

mean in group SA mean in group SLD

0.03219134 0.03857027

ZT 7

Welch Two Sample t-test

data: norm\_L\_BMAL by treatment

t = -0.35635, df = 6.6099, p-value = 0.7327

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.6926786 0.5131329

sample estimates:

mean in group SA mean in group SLD

0.3913511 0.4811240

**ZT 13**

**Welch Two Sample t-test**

**data: norm\_L\_BMAL by treatment**

**t = -2.596, df = 7.3737, p-value = 0.03407**

**alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0**

**95 percent confidence interval:**

**-0.47817775 -0.02474092**

**sample estimates:**

**mean in group SA mean in group SLD**

**0.3638348 0.6152941**

ZT 19

Welch Two Sample t-test

data: norm\_L\_BMAL by treatment

t = -1.8414, df = 6.4697, p-value = 0.1116

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.11814200 0.01566703

sample estimates:

mean in group SA mean in group SLD

0.04130507 0.09254256

CRY

ZT 1

Welch Two Sample t-test

data: norm\_L\_CRY by treatment

t = 0.80598, df = 7.7814, p-value = 0.4442

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.08852753 0.18294768

sample estimates:

mean in group SA mean in group SLD

0.3179259 0.2707158

ZT 7

Welch Two Sample t-test

data: norm\_L\_CRY by treatment

t = -0.10411, df = 6.7495, p-value = 0.9201

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.3585167 0.3284967

sample estimates:

mean in group SA mean in group SLD

0.5611226 0.5761326

ZT 13

Welch Two Sample t-test

data: norm\_L\_CRY by treatment

t = -1.3535, df = 9.9701, p-value = 0.2058

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.4679428 0.1143583

sample estimates:

mean in group SA mean in group SLD

0.3359952 0.5127874

ZT 19

Welch Two Sample t-test

data: norm\_L\_CRY by treatment

t = 1.0176, df = 6.8402, p-value = 0.3435

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.03371256 0.08422871

sample estimates:

mean in group SA mean in group SLD

0.04850755 0.02324948

PER2

ZT 1

Welch Two Sample t-test

data: norm\_L\_PER2 by treatment

t = -0.62025, df = 4.9316, p-value = 0.5626

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.4621827 0.2831045

sample estimates:

mean in group SA mean in group SLD

0.6046467 0.6941858

ZT 7

Welch Two Sample t-test

data: norm\_L\_PER2 by treatment

t = -2.0447, df = 5.9824, p-value = 0.08701

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.14226647 0.01278849

sample estimates:

mean in group SA mean in group SLD

0.07084029 0.13557928

ZT 13

Welch Two Sample t-test

data: norm\_L\_PER2 by treatment

t = -1.0465, df = 3.4862, p-value = 0.3624

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.02131133 0.01013817

sample estimates:

mean in group SA mean in group SLD

0.005650677 0.011237259

ZT 19

Welch Two Sample t-test

data: norm\_L\_PER2 by treatment

t = 1.0393, df = 6.2836, p-value = 0.337

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.01326485 0.03322965

sample estimates:

mean in group SA mean in group SLD

0.02660253 0.01662013

PER3

ZT 1

Welch Two Sample t-test

data: norm\_L\_PER3 by treatment

t = -1.1277, df = 8.7668, p-value = 0.2894

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.16183324 0.05445058

sample estimates:

mean in group SA mean in group SLD

0.1511271 0.2048185

**ZT 7**

**Welch Two Sample t-test**

**data: norm\_L\_PER3 by treatment**

**t = -2.6768, df = 4.5379, p-value = 0.04859**

**alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0**

**95 percent confidence interval:**

**-0.0321650200 -0.0001533023**

**sample estimates:**

**mean in group SA mean in group SLD**

**0.005196182 0.021355343**

ZT 13

Welch Two Sample t-test

data: norm\_L\_PER3 by treatment

t = 1.6418, df = 9.5196, p-value = 0.1332

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.0005045532 0.0032581508

sample estimates:

mean in group SA mean in group SLD

0.002767923 0.001391124

ZT 19

Welch Two Sample t-test

data: norm\_L\_PER3 by treatment

t = 2.2422, df = 6.2915, p-value = 0.06411

alternative hypothesis: true difference in means between group SA and group SLD is not equal to 0

95 percent confidence interval:

-0.02432304 0.63889211

sample estimates:

mean in group SA mean in group SLD

0.4271510 0.1198665