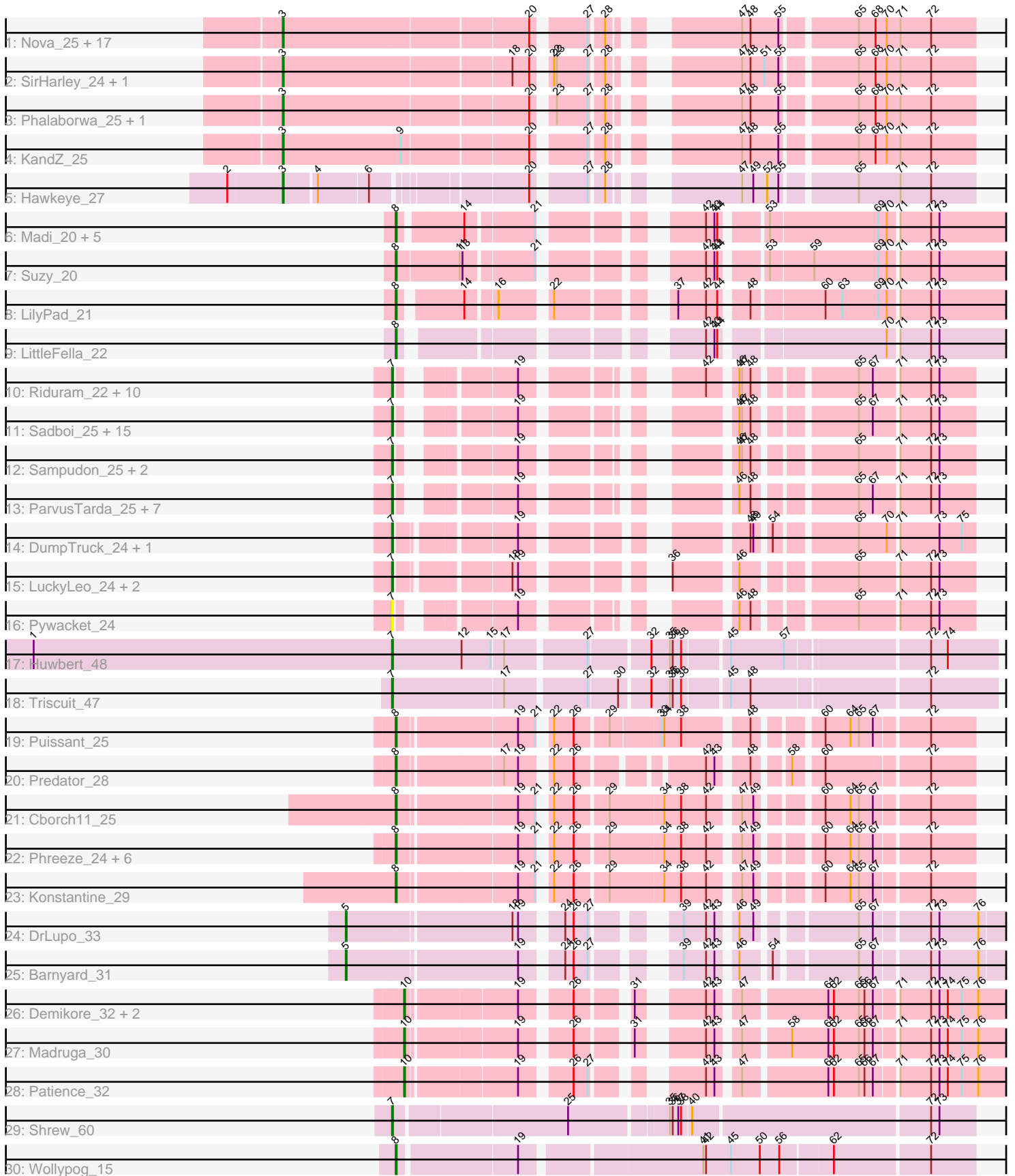


Pham 304886



Note: Tracks are now grouped by subcluster and scaled. Switching in subcluster is indicated by changes in track color. Track scale is now set by default to display the region 30 bp upstream of start 1 to 30 bp downstream of the last possible start. If this default region is judged to be packed too tightly with annotated starts, the track will be further scaled to only show that region of the ORF with annotated starts. This action will be indicated by adding "Zoomed" to the title. For starts, yellow indicates the location of called starts comprised solely of Glimmer/GeneMark auto-annotations, green indicates the location of called starts with at least 1 manual gene annotation.

## Pham 304886 Report

This analysis was run 06/08/26 on database version 649.

Pham number 304886 has 99 members, 8 are drafts.

Phages represented in each track:

- Track 1 : Nova\_25, Butterscotch\_25, Prager\_25, Penelope2018\_25, WaldoWhy\_26, Thoth\_25, BigMama\_23, Chill\_26, Erk16\_25, Giuseppe\_25, Mopey\_25, PLOT\_26, Troll4\_25, Adjutor\_26, Visconti\_25, SuperheroCarly\_25, Helpful\_26, PBI1\_25
- Track 2 : SirHarley\_24, Gumball\_24
- Track 3 : Phalaborwa\_25, Delton\_25
- Track 4 : KandZ\_25
- Track 5 : Hawkeye\_27
- Track 6 : Madi\_20, BiteSize\_20, Terapin\_20, Sienna\_20, Beyoncage\_20, Djokovic\_20
- Track 7 : Suzy\_20
- Track 8 : LilyPad\_21
- Track 9 : LittleFella\_22
- Track 10 : Riduram\_22, Astralis\_22, Alyssamiracle\_24, Avian\_22, Genamy16\_24, Rumi\_24, Charminar\_22, Jamemuya19\_22, RazorC\_22, Stormer\_23, NovaSharks\_24
- Track 11 : Sadboi\_25, Yikes\_26, OtterstedtS21\_25, Alephilan\_22, DaviePasture\_25, Gibbin\_26, Mima20\_23, GretelLyn\_25, Ranch\_25, Patos\_26, Erutan\_25, Zany\_23, Rukungu\_25, NorManre\_26, LavAbarElk\_23, DoobyDoo\_24
- Track 12 : Sampudon\_25, Lila22\_24, Jalebi\_24
- Track 13 : ParvusTarda\_25, Lambo\_25, Fulcrum\_26, MoiGyank\_27, BirthdayBoy\_26, GOATification\_26, Wojtek\_24, Rota\_24
- Track 14 : DumpTruck\_24, Xenia2\_25
- Track 15 : LuckyLeo\_24, Apeppi\_22, Tillicus\_24
- Track 16 : Pywacket\_24
- Track 17 : Huwburt\_48
- Track 18 : Triscuit\_47
- Track 19 : Puissant\_25
- Track 20 : Predator\_28
- Track 21 : Cborch11\_25
- Track 22 : Phreeze\_24, BobtimousPrime\_26, Beckerton\_24, Oaker\_24, Megatron06\_26, Thumb\_24, Damien\_24
- Track 23 : Konstantine\_29
- Track 24 : DrLupo\_33
- Track 25 : Barnyard\_31
- Track 26 : Demikore\_32, SuperSonics\_31, Labelle\_31
- Track 27 : Madruga\_30
- Track 28 : Patience\_32

- Track 29 : Shrew\_60
- Track 30 : Wollypog\_15

### **Summary of Final Annotations (See graph section above for start numbers):**

The start number called the most often in the published annotations is 7, it was called in 42 of the 91 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Alephilan\_22, Alyssamiracle\_24, Apeppi\_22, Astralis\_22, Avian\_22, BirthdayBoy\_26, Charminar\_22, DaviePasture\_25, DoobyDoo\_24, DumpTruck\_24, Erutan\_25, Fulcrum\_26, GOATification\_26, Genamy16\_24, Gibbin\_26, GretellLyn\_25, Huwbart\_48, Jalebi\_24, Jamemuya19\_22, Lambo\_25, LavAbarElk\_23, Lila22\_24, LuckyLeo\_24, Mima20\_23, MoiGyank\_27, NorManre\_26, NovaSharks\_24, OtterstedtS21\_25, ParvusTarda\_25, Patos\_26, Pywacket\_24, Ranch\_25, RazorC\_22, Riduram\_22, Rota\_24, Rukungu\_25, Rumi\_24, Sadboi\_25, Sampudon\_25, Shrew\_60, Stormer\_23, Tillicus\_24, Triscuit\_47, Wojtek\_24, Xenia2\_25, Yikes\_26, Zany\_23,

Genes that have the "Most Annotated" start but do not call it:

- 

Genes that do not have the "Most Annotated" start:

- Adjutor\_26, Barnyard\_31, Beckerton\_24, Beyoncage\_20, BigMama\_23, BiteSize\_20, BobtimousPrime\_26, Butterscotch\_25, Cborch11\_25, Chill\_26, Damien\_24, Delton\_25, Demikore\_32, Djokovic\_20, DrLupo\_33, Erk16\_25, Giuseppe\_25, Gumball\_24, Hawkeye\_27, Helpful\_26, KandZ\_25, Konstantine\_29, Labelle\_31, LilyPad\_21, LittleFella\_22, Madi\_20, Madruga\_30, Megatron06\_26, Mopey\_25, Nova\_25, Oaker\_24, PBI1\_25, PLOT\_26, Patience\_32, Penelope2018\_25, Phalaborwa\_25, Phreeze\_24, Prager\_25, Predator\_28, Puissant\_25, Sienna\_20, SirHarley\_24, SuperSonics\_31, SuperheroCarly\_25, Suzy\_20, Terapin\_20, Thoth\_25, Thumb\_24, Troll4\_25, Visconti\_25, WaldoWhy\_26, Wollypog\_15,

### **Summary by start number:**

Start 3:

- Found in 24 of 99 ( 24.2% ) of genes in pham
- Manual Annotations of this start: 23 of 91
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Adjutor\_26 (D1), BigMama\_23 (D1), Butterscotch\_25 (D1), Chill\_26 (D1), Delton\_25 (D1), Erk16\_25 (D1), Giuseppe\_25 (D1), Gumball\_24 (D1), Hawkeye\_27 (D2), Helpful\_26 (D1), KandZ\_25 (D1), Mopey\_25 (D1), Nova\_25 (D1), PBI1\_25 (D1), PLOT\_26 (D1), Penelope2018\_25 (D1), Phalaborwa\_25 (D1), Prager\_25 (D1), SirHarley\_24 (D1), SuperheroCarly\_25 (D1), Thoth\_25 (D1), Troll4\_25 (D1), Visconti\_25 (D1), WaldoWhy\_26 (D1),

Start 5:

- Found in 2 of 99 ( 2.0% ) of genes in pham
- Manual Annotations of this start: 2 of 91
- Called 100.0% of time when present

- Phage (with cluster) where this start called: Barnyard\_31 (H2), DrLupo\_33 (H2),

#### Start 7:

- Found in 47 of 99 ( 47.5% ) of genes in pham
- Manual Annotations of this start: 42 of 91
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Alephilan\_22 (DV), Alyssamiracle\_24 (DV), Apeppi\_22 (DV), Astralis\_22 (DV), Avian\_22 (DV), BirthdayBoy\_26 (DV), Charminar\_22 (DV), DaviePasture\_25 (DV), DoobyDoo\_24 (DV), DumpTruck\_24 (DV), Erutan\_25 (DV), Fulcrum\_26 (DV), GOATification\_26 (DV), Genamy16\_24 (DV), Gibbin\_26 (DV), GretelLyn\_25 (DV), Huwbert\_48 (GG), Jalebi\_24 (DV), Jamemuya19\_22 (DV), Lambo\_25 (DV), LavAbarElk\_23 (DV), Lila22\_24 (DV), LuckyLeo\_24 (DV), Mima20\_23 (DV), MoiGyank\_27 (DV), NorManre\_26 (DV), NovaSharks\_24 (DV), OtterstedtS21\_25 (DV), ParvusTarda\_25 (DV), Patos\_26 (DV), Pywacket\_24 (DV), Ranch\_25 (DV), RazorC\_22 (DV), Riduram\_22 (DV), Rota\_24 (DV), Rukungu\_25 (DV), Rumi\_24 (DV), Sadboi\_25 (DV), Sampudon\_25 (DV), Shrew\_60 (singleton), Stormer\_23 (DV), Tillicus\_24 (DV), Triscuit\_47 (GG), Wojtek\_24 (DV), Xenia2\_25 (DV), Yikes\_26 (DV), Zany\_23 (DV),

#### Start 8:

- Found in 21 of 99 ( 21.2% ) of genes in pham
- Manual Annotations of this start: 21 of 91
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Beckerton\_24 (H1), Beyoncage\_20 (DG1), BiteSize\_20 (DG1), BobtimousPrime\_26 (H1), Cborch11\_25 (H1), Damien\_24 (H1), Djokovic\_20 (DG1), Konstantine\_29 (H1), LilyPad\_21 (DG1), LittleFella\_22 (DG2), Madi\_20 (DG1), Megatron06\_26 (H1), Oaker\_24 (H1), Phreeze\_24 (H1), Predator\_28 (H1), Puissant\_25 (H1), Sienna\_20 (DG1), Suzy\_20 (DG1), Terapin\_20 (DG1), Thumb\_24 (H1), Wollypog\_15 (singleton),

#### Start 10:

- Found in 5 of 99 ( 5.1% ) of genes in pham
- Manual Annotations of this start: 3 of 91
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Demikore\_32 (U), Labelle\_31 (U), Madrugas\_30 (U), Patience\_32 (U), SuperSonics\_31 (U),

### Summary by clusters:

There are 10 clusters represented in this pham: DG2, singleton, H2, H1, GG, DG1, U, DV, D2, D1,

Info for manual annotations of cluster D1:

- Start number 3 was manually annotated 22 times for cluster D1.

Info for manual annotations of cluster D2:

- Start number 3 was manually annotated 1 time for cluster D2.

Info for manual annotations of cluster DG1:

- Start number 8 was manually annotated 8 times for cluster DG1.

Info for manual annotations of cluster DG2:

- Start number 8 was manually annotated 1 time for cluster DG2.

Info for manual annotations of cluster DV:

- Start number 7 was manually annotated 39 times for cluster DV.

Info for manual annotations of cluster GG:

- Start number 7 was manually annotated 2 times for cluster GG.

Info for manual annotations of cluster H1:

- Start number 8 was manually annotated 11 times for cluster H1.

Info for manual annotations of cluster H2:

- Start number 5 was manually annotated 2 times for cluster H2.

Info for manual annotations of cluster U:

- Start number 10 was manually annotated 3 times for cluster U.

### **Gene Information:**

Gene: Adjutor\_26 Start: 15426, Stop: 16079, Start Num: 3

Candidate Starts for Adjutor\_26:

(Start: 3 @15426 has 23 MA's), (20, 15681), (27, 15729), (28, 15741), (47, 15843), (48, 15852), (55, 15882), (65, 15954), (68, 15972), (70, 15984), (71, 15999), (72, 16032),

Gene: Alephilan\_22 Start: 15936, Stop: 16421, Start Num: 7

Candidate Starts for Alephilan\_22:

(Start: 7 @15936 has 42 MA's), (19, 16041), (46, 16197), (47, 16200), (48, 16209), (65, 16302), (67, 16317), (71, 16341), (72, 16374), (73, 16383),

Gene: Alyssamiracle\_24 Start: 14342, Stop: 14818, Start Num: 7

Candidate Starts for Alyssamiracle\_24:

(Start: 7 @14342 has 42 MA's), (19, 14438), (42, 14570), (46, 14594), (47, 14597), (48, 14606), (65, 14699), (67, 14714), (71, 14738), (72, 14771), (73, 14780),

Gene: Apeppi\_22 Start: 16058, Stop: 16555, Start Num: 7

Candidate Starts for Apeppi\_22:

(Start: 7 @16058 has 42 MA's), (18, 16163), (19, 16169), (36, 16271), (46, 16331), (65, 16436), (71, 16475), (72, 16508), (73, 16517),

Gene: Astralis\_22 Start: 14342, Stop: 14818, Start Num: 7

Candidate Starts for Astralis\_22:

(Start: 7 @14342 has 42 MA's), (19, 14438), (42, 14570), (46, 14594), (47, 14597), (48, 14606), (65, 14699), (67, 14714), (71, 14738), (72, 14771), (73, 14780),

Gene: Avian\_22 Start: 14342, Stop: 14818, Start Num: 7

Candidate Starts for Avian\_22:

(Start: 7 @14342 has 42 MA's), (19, 14438), (42, 14570), (46, 14594), (47, 14597), (48, 14606), (65, 14699), (67, 14714), (71, 14738), (72, 14771), (73, 14780),

Gene: Barnyard\_31 Start: 17229, Stop: 17840, Start Num: 5

Candidate Starts for Barnyard\_31:

(Start: 5 @17229 has 2 MA's), (19, 17403), (24, 17439), (26, 17448), (27, 17463), (39, 17523), (42, 17547), (43, 17556), (46, 17571), (54, 17598), (65, 17676), (67, 17691), (72, 17745), (73, 17754), (76, 17796),

Gene: Beckerton\_24 Start: 15907, Stop: 16452, Start Num: 8

Candidate Starts for Beckerton\_24:

(Start: 8 @15907 has 21 MA's), (19, 16027), (21, 16045), (22, 16051), (26, 16072), (29, 16105), (34, 16162), (38, 16180), (42, 16207), (47, 16234), (49, 16246), (60, 16300), (64, 16327), (65, 16336), (67, 16351), (72, 16405),

Gene: Beyoncage\_20 Start: 11749, Stop: 12312, Start Num: 8

Candidate Starts for Beyoncage\_20:

(Start: 8 @11749 has 21 MA's), (14, 11812), (21, 11878), (42, 12004), (43, 12013), (44, 12016), (53, 12055), (69, 12169), (70, 12178), (71, 12187), (72, 12220), (73, 12229),

Gene: BigMama\_23 Start: 15502, Stop: 16155, Start Num: 3

Candidate Starts for BigMama\_23:

(Start: 3 @15502 has 23 MA's), (20, 15757), (27, 15805), (28, 15817), (47, 15919), (48, 15928), (55, 15958), (65, 16030), (68, 16048), (70, 16060), (71, 16075), (72, 16108),

Gene: BirthdayBoy\_26 Start: 16789, Stop: 17265, Start Num: 7

Candidate Starts for BirthdayBoy\_26:

(Start: 7 @16789 has 42 MA's), (19, 16885), (46, 17041), (48, 17053), (65, 17146), (67, 17161), (71, 17185), (72, 17218), (73, 17227),

Gene: BiteSize\_20 Start: 11749, Stop: 12312, Start Num: 8

Candidate Starts for BiteSize\_20:

(Start: 8 @11749 has 21 MA's), (14, 11812), (21, 11878), (42, 12004), (43, 12013), (44, 12016), (53, 12055), (69, 12169), (70, 12178), (71, 12187), (72, 12220), (73, 12229),

Gene: BobtimousPrime\_26 Start: 15827, Stop: 16372, Start Num: 8

Candidate Starts for BobtimousPrime\_26:

(Start: 8 @15827 has 21 MA's), (19, 15947), (21, 15965), (22, 15971), (26, 15992), (29, 16025), (34, 16082), (38, 16100), (42, 16127), (47, 16154), (49, 16166), (60, 16220), (64, 16247), (65, 16256), (67, 16271), (72, 16325),

Gene: Butterscotch\_25 Start: 15486, Stop: 16139, Start Num: 3

Candidate Starts for Butterscotch\_25:

(Start: 3 @15486 has 23 MA's), (20, 15741), (27, 15789), (28, 15801), (47, 15903), (48, 15912), (55, 15942), (65, 16014), (68, 16032), (70, 16044), (71, 16059), (72, 16092),

Gene: Cborch11\_25 Start: 15369, Stop: 15914, Start Num: 8

Candidate Starts for Cborch11\_25:

(Start: 8 @15369 has 21 MA's), (19, 15489), (21, 15507), (22, 15513), (26, 15534), (29, 15567), (34, 15624), (38, 15642), (42, 15669), (47, 15696), (49, 15708), (60, 15762), (64, 15789), (65, 15798), (67, 15813), (72, 15867),

Gene: Charminar\_22 Start: 14342, Stop: 14818, Start Num: 7

Candidate Starts for Charminar\_22:

(Start: 7 @14342 has 42 MA's), (19, 14438), (42, 14570), (46, 14594), (47, 14597), (48, 14606), (65, 14699), (67, 14714), (71, 14738), (72, 14771), (73, 14780),

Gene: Chill\_26 Start: 15492, Stop: 16145, Start Num: 3

Candidate Starts for Chill\_26:

(Start: 3 @15492 has 23 MA's), (20, 15747), (27, 15795), (28, 15807), (47, 15909), (48, 15918), (55, 15948), (65, 16020), (68, 16038), (70, 16050), (71, 16065), (72, 16098),

Gene: Damien\_24 Start: 15370, Stop: 15915, Start Num: 8

Candidate Starts for Damien\_24:

(Start: 8 @15370 has 21 MA's), (19, 15490), (21, 15508), (22, 15514), (26, 15535), (29, 15568), (34, 15625), (38, 15643), (42, 15670), (47, 15697), (49, 15709), (60, 15763), (64, 15790), (65, 15799), (67, 15814), (72, 15868),

Gene: DaviePasture\_25 Start: 16546, Stop: 17034, Start Num: 7

Candidate Starts for DaviePasture\_25:

(Start: 7 @16546 has 42 MA's), (19, 16654), (46, 16810), (47, 16813), (48, 16822), (65, 16915), (67, 16930), (71, 16954), (72, 16987), (73, 16996),

Gene: Delton\_25 Start: 15498, Stop: 16151, Start Num: 3

Candidate Starts for Delton\_25:

(Start: 3 @15498 has 23 MA's), (20, 15753), (23, 15768), (27, 15801), (28, 15813), (47, 15915), (48, 15924), (55, 15954), (65, 16026), (68, 16044), (70, 16056), (71, 16071), (72, 16104),

Gene: Demikore\_32 Start: 18730, Stop: 19290, Start Num: 10

Candidate Starts for Demikore\_32:

(Start: 10 @18730 has 3 MA's), (19, 18838), (26, 18883), (31, 18928), (42, 18979), (43, 18988), (47, 19006), (61, 19090), (62, 19096), (65, 19123), (66, 19129), (67, 19138), (71, 19159), (72, 19192), (73, 19201), (74, 19210), (75, 19225), (76, 19243),

Gene: Djokovic\_20 Start: 11749, Stop: 12312, Start Num: 8

Candidate Starts for Djokovic\_20:

(Start: 8 @11749 has 21 MA's), (14, 11812), (21, 11878), (42, 12004), (43, 12013), (44, 12016), (53, 12055), (69, 12169), (70, 12178), (71, 12187), (72, 12220), (73, 12229),

Gene: DoobyDoo\_24 Start: 15723, Stop: 16199, Start Num: 7

Candidate Starts for DoobyDoo\_24:

(Start: 7 @15723 has 42 MA's), (19, 15819), (46, 15975), (47, 15978), (48, 15987), (65, 16080), (67, 16095), (71, 16119), (72, 16152), (73, 16161),

Gene: DrLupo\_33 Start: 17635, Stop: 18246, Start Num: 5

Candidate Starts for DrLupo\_33:

(Start: 5 @17635 has 2 MA's), (18, 17803), (19, 17809), (24, 17845), (26, 17854), (27, 17869), (39, 17929), (42, 17953), (43, 17962), (46, 17977), (49, 17992), (65, 18082), (67, 18097), (72, 18151), (73, 18160), (76, 18202),

Gene: DumpTruck\_24 Start: 15958, Stop: 16452, Start Num: 7

Candidate Starts for DumpTruck\_24:

(Start: 7 @15958 has 42 MA's), (19, 16066), (48, 16240), (49, 16243), (54, 16255), (65, 16333), (70, 16363), (71, 16372), (73, 16414), (75, 16438),

Gene: Erk16\_25 Start: 15489, Stop: 16142, Start Num: 3

Candidate Starts for Erk16\_25:

(Start: 3 @15489 has 23 MA's), (20, 15744), (27, 15792), (28, 15804), (47, 15906), (48, 15915), (55, 15945), (65, 16017), (68, 16035), (70, 16047), (71, 16062), (72, 16095),

Gene: Erutan\_25 Start: 16236, Stop: 16712, Start Num: 7

Candidate Starts for Erutan\_25:

(Start: 7 @16236 has 42 MA's), (19, 16332), (46, 16488), (47, 16491), (48, 16500), (65, 16593), (67, 16608), (71, 16632), (72, 16665), (73, 16674),

Gene: Fulcrum\_26 Start: 16769, Stop: 17245, Start Num: 7

Candidate Starts for Fulcrum\_26:

(Start: 7 @16769 has 42 MA's), (19, 16865), (46, 17021), (48, 17033), (65, 17126), (67, 17141), (71, 17165), (72, 17198), (73, 17207),

Gene: GOATification\_26 Start: 16769, Stop: 17245, Start Num: 7

Candidate Starts for GOATification\_26:

(Start: 7 @16769 has 42 MA's), (19, 16865), (46, 17021), (48, 17033), (65, 17126), (67, 17141), (71, 17165), (72, 17198), (73, 17207),

Gene: Genamy16\_24 Start: 14342, Stop: 14818, Start Num: 7

Candidate Starts for Genamy16\_24:

(Start: 7 @14342 has 42 MA's), (19, 14438), (42, 14570), (46, 14594), (47, 14597), (48, 14606), (65, 14699), (67, 14714), (71, 14738), (72, 14771), (73, 14780),

Gene: Gibbin\_26 Start: 16829, Stop: 17317, Start Num: 7

Candidate Starts for Gibbin\_26:

(Start: 7 @16829 has 42 MA's), (19, 16937), (46, 17093), (47, 17096), (48, 17105), (65, 17198), (67, 17213), (71, 17237), (72, 17270), (73, 17279),

Gene: Giuseppe\_25 Start: 15478, Stop: 16131, Start Num: 3

Candidate Starts for Giuseppe\_25:

(Start: 3 @15478 has 23 MA's), (20, 15733), (27, 15781), (28, 15793), (47, 15895), (48, 15904), (55, 15934), (65, 16006), (68, 16024), (70, 16036), (71, 16051), (72, 16084),

Gene: GretelLyn\_25 Start: 17103, Stop: 17579, Start Num: 7

Candidate Starts for GretelLyn\_25:

(Start: 7 @17103 has 42 MA's), (19, 17199), (46, 17355), (47, 17358), (48, 17367), (65, 17460), (67, 17475), (71, 17499), (72, 17532), (73, 17541),

Gene: Gumball\_24 Start: 15436, Stop: 16089, Start Num: 3

Candidate Starts for Gumball\_24:

(Start: 3 @15436 has 23 MA's), (18, 15673), (20, 15691), (22, 15703), (23, 15706), (27, 15739), (28, 15751), (47, 15853), (48, 15862), (51, 15877), (55, 15892), (65, 15964), (68, 15982), (70, 15994), (71, 16009), (72, 16042),

Gene: Hawkeye\_27 Start: 15385, Stop: 16014, Start Num: 3

Candidate Starts for Hawkeye\_27:

(2, 15328), (Start: 3 @15385 has 23 MA's), (4, 15418), (6, 15469), (20, 15616), (27, 15664), (28, 15676), (47, 15778), (49, 15790), (52, 15805), (55, 15817), (65, 15889), (71, 15934), (72, 15967),

Gene: Helpful\_26 Start: 15486, Stop: 16139, Start Num: 3

Candidate Starts for Helpful\_26:

(Start: 3 @15486 has 23 MA's), (20, 15741), (27, 15789), (28, 15801), (47, 15903), (48, 15912), (55, 15942), (65, 16014), (68, 16032), (70, 16044), (71, 16059), (72, 16092),

Gene: Huwbert\_48 Start: 24385, Stop: 24990, Start Num: 7

Candidate Starts for Huwbert\_48:

(1, 23998), (Start: 7 @24385 has 42 MA's), (12, 24460), (15, 24490), (17, 24502), (27, 24583), (32, 24643), (35, 24661), (36, 24664), (38, 24673), (45, 24718), (57, 24775), (72, 24919), (74, 24937),

Gene: Jalebi\_24 Start: 17279, Stop: 17755, Start Num: 7

Candidate Starts for Jalebi\_24:

(Start: 7 @17279 has 42 MA's), (19, 17375), (46, 17531), (47, 17534), (48, 17543), (65, 17636), (71, 17675), (72, 17708), (73, 17717),

Gene: Jamemuya19\_22 Start: 14342, Stop: 14818, Start Num: 7

Candidate Starts for Jamemuya19\_22:

(Start: 7 @14342 has 42 MA's), (19, 14438), (42, 14570), (46, 14594), (47, 14597), (48, 14606), (65, 14699), (67, 14714), (71, 14738), (72, 14771), (73, 14780),

Gene: KandZ\_25 Start: 15586, Stop: 16239, Start Num: 3

Candidate Starts for KandZ\_25:

(Start: 3 @15586 has 23 MA's), (9, 15712), (20, 15841), (27, 15889), (28, 15901), (47, 16003), (48, 16012), (55, 16042), (65, 16114), (68, 16132), (70, 16144), (71, 16159), (72, 16192),

Gene: Konstantine\_29 Start: 16571, Stop: 17116, Start Num: 8

Candidate Starts for Konstantine\_29:

(Start: 8 @16571 has 21 MA's), (19, 16691), (21, 16709), (22, 16715), (26, 16736), (29, 16769), (34, 16826), (38, 16844), (42, 16871), (47, 16898), (49, 16910), (60, 16964), (64, 16991), (65, 17000), (67, 17015), (72, 17069),

Gene: Labelle\_31 Start: 18732, Stop: 19292, Start Num: 10

Candidate Starts for Labelle\_31:

(Start: 10 @18732 has 3 MA's), (19, 18840), (26, 18885), (31, 18930), (42, 18981), (43, 18990), (47, 19008), (61, 19092), (62, 19098), (65, 19125), (66, 19131), (67, 19140), (71, 19161), (72, 19194), (73, 19203), (74, 19212), (75, 19227), (76, 19245),

Gene: Lambo\_25 Start: 16772, Stop: 17257, Start Num: 7

Candidate Starts for Lambo\_25:

(Start: 7 @16772 has 42 MA's), (19, 16877), (46, 17033), (48, 17045), (65, 17138), (67, 17153), (71, 17177), (72, 17210), (73, 17219),

Gene: LavAbarElk\_23 Start: 15206, Stop: 15694, Start Num: 7

Candidate Starts for LavAbarElk\_23:

(Start: 7 @15206 has 42 MA's), (19, 15314), (46, 15470), (47, 15473), (48, 15482), (65, 15575), (67, 15590), (71, 15614), (72, 15647), (73, 15656),

Gene: Lila22\_24 Start: 16727, Stop: 17203, Start Num: 7

Candidate Starts for Lila22\_24:

(Start: 7 @16727 has 42 MA's), (19, 16823), (46, 16979), (47, 16982), (48, 16991), (65, 17084), (71, 17123), (72, 17156), (73, 17165),

Gene: LilyPad\_21 Start: 12413, Stop: 12973, Start Num: 8

Candidate Starts for LilyPad\_21:

(Start: 8 @12413 has 21 MA's), (14, 12473), (16, 12500), (22, 12545), (37, 12635), (42, 12665), (44, 12677), (48, 12701), (60, 12773), (63, 12791), (69, 12830), (70, 12839), (71, 12848), (72, 12881), (73, 12890),

Gene: LittleFella\_22 Start: 14288, Stop: 14845, Start Num: 8

Candidate Starts for LittleFella\_22:

(Start: 8 @14288 has 21 MA's), (42, 14537), (43, 14546), (44, 14549), (70, 14711), (71, 14720), (72, 14753), (73, 14762),

Gene: LuckyLeo\_24 Start: 16058, Stop: 16555, Start Num: 7

Candidate Starts for LuckyLeo\_24:

(Start: 7 @16058 has 42 MA's), (18, 16163), (19, 16169), (36, 16271), (46, 16331), (65, 16436), (71, 16475), (72, 16508), (73, 16517),

Gene: Madi\_20 Start: 11749, Stop: 12312, Start Num: 8

Candidate Starts for Madi\_20:

(Start: 8 @11749 has 21 MA's), (14, 11812), (21, 11878), (42, 12004), (43, 12013), (44, 12016), (53, 12055), (69, 12169), (70, 12178), (71, 12187), (72, 12220), (73, 12229),

Gene: Madruga\_30 Start: 18401, Stop: 18961, Start Num: 10

Candidate Starts for Madruga\_30:

(Start: 10 @18401 has 3 MA's), (19, 18509), (26, 18554), (31, 18599), (42, 18650), (43, 18659), (47, 18677), (58, 18722), (61, 18761), (62, 18767), (65, 18794), (66, 18800), (67, 18809), (71, 18830), (72, 18863), (73, 18872), (74, 18881), (75, 18896), (76, 18914),

Gene: Megatron06\_26 Start: 15903, Stop: 16448, Start Num: 8

Candidate Starts for Megatron06\_26:

(Start: 8 @15903 has 21 MA's), (19, 16023), (21, 16041), (22, 16047), (26, 16068), (29, 16101), (34, 16158), (38, 16176), (42, 16203), (47, 16230), (49, 16242), (60, 16296), (64, 16323), (65, 16332), (67, 16347), (72, 16401),

Gene: Mima20\_23 Start: 16456, Stop: 16944, Start Num: 7

Candidate Starts for Mima20\_23:

(Start: 7 @16456 has 42 MA's), (19, 16564), (46, 16720), (47, 16723), (48, 16732), (65, 16825), (67, 16840), (71, 16864), (72, 16897), (73, 16906),

Gene: MoiGyank\_27 Start: 17140, Stop: 17616, Start Num: 7

Candidate Starts for MoiGyank\_27:

(Start: 7 @17140 has 42 MA's), (19, 17236), (46, 17392), (48, 17404), (65, 17497), (67, 17512), (71, 17536), (72, 17569), (73, 17578),

Gene: Mopey\_25 Start: 15486, Stop: 16139, Start Num: 3

Candidate Starts for Mopey\_25:

(Start: 3 @15486 has 23 MA's), (20, 15741), (27, 15789), (28, 15801), (47, 15903), (48, 15912), (55, 15942), (65, 16014), (68, 16032), (70, 16044), (71, 16059), (72, 16092),

Gene: NorManre\_26 Start: 16335, Stop: 16823, Start Num: 7

Candidate Starts for NorManre\_26:

(Start: 7 @16335 has 42 MA's), (19, 16443), (46, 16599), (47, 16602), (48, 16611), (65, 16704), (67, 16719), (71, 16743), (72, 16776), (73, 16785),

Gene: Nova\_25 Start: 15913, Stop: 16566, Start Num: 3

Candidate Starts for Nova\_25:

(Start: 3 @15913 has 23 MA's), (20, 16168), (27, 16216), (28, 16228), (47, 16330), (48, 16339), (55, 16369), (65, 16441), (68, 16459), (70, 16471), (71, 16486), (72, 16519),

Gene: NovaSharks\_24 Start: 14342, Stop: 14818, Start Num: 7

Candidate Starts for NovaSharks\_24:

(Start: 7 @14342 has 42 MA's), (19, 14438), (42, 14570), (46, 14594), (47, 14597), (48, 14606), (65, 14699), (67, 14714), (71, 14738), (72, 14771), (73, 14780),

Gene: Oaker\_24 Start: 15627, Stop: 16172, Start Num: 8

Candidate Starts for Oaker\_24:

(Start: 8 @15627 has 21 MA's), (19, 15747), (21, 15765), (22, 15771), (26, 15792), (29, 15825), (34, 15882), (38, 15900), (42, 15927), (47, 15954), (49, 15966), (60, 16020), (64, 16047), (65, 16056), (67, 16071), (72, 16125),

Gene: OtterstedtS21\_25 Start: 16425, Stop: 16901, Start Num: 7

Candidate Starts for OtterstedtS21\_25:

(Start: 7 @16425 has 42 MA's), (19, 16521), (46, 16677), (47, 16680), (48, 16689), (65, 16782), (67, 16797), (71, 16821), (72, 16854), (73, 16863),

Gene: PBI1\_25 Start: 15417, Stop: 16070, Start Num: 3

Candidate Starts for PBI1\_25:

(Start: 3 @15417 has 23 MA's), (20, 15672), (27, 15720), (28, 15732), (47, 15834), (48, 15843), (55, 15873), (65, 15945), (68, 15963), (70, 15975), (71, 15990), (72, 16023),

Gene: PLOT\_26 Start: 15489, Stop: 16142, Start Num: 3

Candidate Starts for PLOT\_26:

(Start: 3 @15489 has 23 MA's), (20, 15744), (27, 15792), (28, 15804), (47, 15906), (48, 15915), (55, 15945), (65, 16017), (68, 16035), (70, 16047), (71, 16062), (72, 16095),

Gene: ParvusTarda\_25 Start: 15907, Stop: 16383, Start Num: 7

Candidate Starts for ParvusTarda\_25:

(Start: 7 @15907 has 42 MA's), (19, 16003), (46, 16159), (48, 16171), (65, 16264), (67, 16279), (71, 16303), (72, 16336), (73, 16345),

Gene: Patience\_32 Start: 19282, Stop: 19842, Start Num: 10

Candidate Starts for Patience\_32:

(Start: 10 @19282 has 3 MA's), (19, 19390), (26, 19435), (27, 19450), (42, 19531), (43, 19540), (47, 19558), (61, 19642), (62, 19648), (65, 19675), (66, 19681), (67, 19690), (71, 19711), (72, 19744), (73, 19753), (74, 19762), (75, 19777), (76, 19795),

Gene: Patos\_26 Start: 16335, Stop: 16823, Start Num: 7

Candidate Starts for Patos\_26:

(Start: 7 @16335 has 42 MA's), (19, 16443), (46, 16599), (47, 16602), (48, 16611), (65, 16704), (67, 16719), (71, 16743), (72, 16776), (73, 16785),

Gene: Penelope2018\_25 Start: 15486, Stop: 16139, Start Num: 3

Candidate Starts for Penelope2018\_25:

(Start: 3 @15486 has 23 MA's), (20, 15741), (27, 15789), (28, 15801), (47, 15903), (48, 15912), (55, 15942), (65, 16014), (68, 16032), (70, 16044), (71, 16059), (72, 16092),

Gene: Phalaborwa\_25 Start: 15519, Stop: 16172, Start Num: 3

Candidate Starts for Phalaborwa\_25:

(Start: 3 @15519 has 23 MA's), (20, 15774), (23, 15789), (27, 15822), (28, 15834), (47, 15936), (48, 15945), (55, 15975), (65, 16047), (68, 16065), (70, 16077), (71, 16092), (72, 16125),

Gene: Phreeze\_24 Start: 15370, Stop: 15915, Start Num: 8

Candidate Starts for Phreeze\_24:

(Start: 8 @15370 has 21 MA's), (19, 15490), (21, 15508), (22, 15514), (26, 15535), (29, 15568), (34, 15625), (38, 15643), (42, 15670), (47, 15697), (49, 15709), (60, 15763), (64, 15790), (65, 15799), (67, 15814), (72, 15868),

Gene: Prager\_25 Start: 15498, Stop: 16151, Start Num: 3

Candidate Starts for Prager\_25:

(Start: 3 @15498 has 23 MA's), (20, 15753), (27, 15801), (28, 15813), (47, 15915), (48, 15924), (55, 15954), (65, 16026), (68, 16044), (70, 16056), (71, 16071), (72, 16104),

Gene: Predator\_28 Start: 16911, Stop: 17432, Start Num: 8

Candidate Starts for Predator\_28:

(Start: 8 @16911 has 21 MA's), (17, 17016), (19, 17031), (22, 17055), (26, 17076), (42, 17187), (43, 17196), (48, 17223), (58, 17253), (60, 17280), (72, 17385),

Gene: Puissant\_25 Start: 15838, Stop: 16380, Start Num: 8

Candidate Starts for Puissant\_25:

(Start: 8 @15838 has 21 MA's), (19, 15958), (21, 15976), (22, 15982), (26, 16003), (29, 16036), (33, 16087), (34, 16090), (38, 16108), (48, 16171), (60, 16228), (64, 16255), (65, 16264), (67, 16279), (72, 16333),

Gene: Pywacket\_24 Start: 17264, Stop: 17740, Start Num: 7

Candidate Starts for Pywacket\_24:

(Start: 7 @17264 has 42 MA's), (19, 17360), (46, 17516), (48, 17528), (65, 17621), (71, 17660), (72, 17693), (73, 17702),

Gene: Ranch\_25 Start: 15273, Stop: 15749, Start Num: 7

Candidate Starts for Ranch\_25:

(Start: 7 @15273 has 42 MA's), (19, 15369), (46, 15525), (47, 15528), (48, 15537), (65, 15630), (67, 15645), (71, 15669), (72, 15702), (73, 15711),

Gene: RazorC\_22 Start: 14342, Stop: 14818, Start Num: 7

Candidate Starts for RazorC\_22:

(Start: 7 @14342 has 42 MA's), (19, 14438), (42, 14570), (46, 14594), (47, 14597), (48, 14606), (65, 14699), (67, 14714), (71, 14738), (72, 14771), (73, 14780),

Gene: Riduram\_22 Start: 14312, Stop: 14788, Start Num: 7

Candidate Starts for Riduram\_22:

(Start: 7 @14312 has 42 MA's), (19, 14408), (42, 14540), (46, 14564), (47, 14567), (48, 14576), (65, 14669), (67, 14684), (71, 14708), (72, 14741), (73, 14750),

Gene: Rota\_24 Start: 16231, Stop: 16707, Start Num: 7

Candidate Starts for Rota\_24:

(Start: 7 @16231 has 42 MA's), (19, 16327), (46, 16483), (48, 16495), (65, 16588), (67, 16603), (71, 16627), (72, 16660), (73, 16669),

Gene: Rukungu\_25 Start: 16972, Stop: 17448, Start Num: 7

Candidate Starts for Rukungu\_25:

(Start: 7 @16972 has 42 MA's), (19, 17068), (46, 17224), (47, 17227), (48, 17236), (65, 17329), (67, 17344), (71, 17368), (72, 17401), (73, 17410),

Gene: Rumi\_24 Start: 14342, Stop: 14818, Start Num: 7

Candidate Starts for Rumi\_24:

(Start: 7 @14342 has 42 MA's), (19, 14438), (42, 14570), (46, 14594), (47, 14597), (48, 14606), (65, 14699), (67, 14714), (71, 14738), (72, 14771), (73, 14780),

Gene: Sadboi\_25 Start: 17103, Stop: 17579, Start Num: 7

Candidate Starts for Sadboi\_25:

(Start: 7 @17103 has 42 MA's), (19, 17199), (46, 17355), (47, 17358), (48, 17367), (65, 17460), (67, 17475), (71, 17499), (72, 17532), (73, 17541),

Gene: Sampudon\_25 Start: 17279, Stop: 17755, Start Num: 7

Candidate Starts for Sampudon\_25:

(Start: 7 @17279 has 42 MA's), (19, 17375), (46, 17531), (47, 17534), (48, 17543), (65, 17636), (71, 17675), (72, 17708), (73, 17717),

Gene: Shrew\_60 Start: 29033, Stop: 29623, Start Num: 7

Candidate Starts for Shrew\_60:

(Start: 7 @29033 has 42 MA's), (25, 29210), (35, 29309), (36, 29312), (37, 29318), (38, 29321), (40, 29330), (72, 29576), (73, 29585),

Gene: Sienna\_20 Start: 11749, Stop: 12312, Start Num: 8

Candidate Starts for Sienna\_20:

(Start: 8 @11749 has 21 MA's), (14, 11812), (21, 11878), (42, 12004), (43, 12013), (44, 12016), (53, 12055), (69, 12169), (70, 12178), (71, 12187), (72, 12220), (73, 12229),

Gene: SirHarley\_24 Start: 15418, Stop: 16071, Start Num: 3

Candidate Starts for SirHarley\_24:

(Start: 3 @15418 has 23 MA's), (18, 15655), (20, 15673), (22, 15685), (23, 15688), (27, 15721), (28, 15733), (47, 15835), (48, 15844), (51, 15859), (55, 15874), (65, 15946), (68, 15964), (70, 15976), (71, 15991), (72, 16024),

Gene: Stormer\_23 Start: 14342, Stop: 14818, Start Num: 7

Candidate Starts for Stormer\_23:

(Start: 7 @14342 has 42 MA's), (19, 14438), (42, 14570), (46, 14594), (47, 14597), (48, 14606), (65, 14699), (67, 14714), (71, 14738), (72, 14771), (73, 14780),

Gene: SuperSonics\_31 Start: 18458, Stop: 19018, Start Num: 10

Candidate Starts for SuperSonics\_31:

(Start: 10 @18458 has 3 MA's), (19, 18566), (26, 18611), (31, 18656), (42, 18707), (43, 18716), (47, 18734), (61, 18818), (62, 18824), (65, 18851), (66, 18857), (67, 18866), (71, 18887), (72, 18920), (73, 18929), (74, 18938), (75, 18953), (76, 18971),

Gene: SuperheroCarly\_25 Start: 15348, Stop: 16001, Start Num: 3

Candidate Starts for SuperheroCarly\_25:

(Start: 3 @15348 has 23 MA's), (20, 15603), (27, 15651), (28, 15663), (47, 15765), (48, 15774), (55, 15804), (65, 15876), (68, 15894), (70, 15906), (71, 15921), (72, 15954),

Gene: Suzy\_20 Start: 12976, Stop: 13545, Start Num: 8

Candidate Starts for Suzy\_20:

(Start: 8 @12976 has 21 MA's), (11, 13039), (13, 13042), (21, 13111), (42, 13237), (43, 13246), (44, 13249), (53, 13288), (59, 13333), (69, 13402), (70, 13411), (71, 13420), (72, 13453), (73, 13462),

Gene: Terapin\_20 Start: 11749, Stop: 12312, Start Num: 8

Candidate Starts for Terapin\_20:

(Start: 8 @11749 has 21 MA's), (14, 11812), (21, 11878), (42, 12004), (43, 12013), (44, 12016), (53, 12055), (69, 12169), (70, 12178), (71, 12187), (72, 12220), (73, 12229),

Gene: Thoth\_25 Start: 15483, Stop: 16136, Start Num: 3

Candidate Starts for Thoth\_25:

(Start: 3 @15483 has 23 MA's), (20, 15738), (27, 15786), (28, 15798), (47, 15900), (48, 15909), (55, 15939), (65, 16011), (68, 16029), (70, 16041), (71, 16056), (72, 16089),

Gene: Thumb\_24 Start: 15370, Stop: 15915, Start Num: 8

Candidate Starts for Thumb\_24:

(Start: 8 @15370 has 21 MA's), (19, 15490), (21, 15508), (22, 15514), (26, 15535), (29, 15568), (34, 15625), (38, 15643), (42, 15670), (47, 15697), (49, 15709), (60, 15763), (64, 15790), (65, 15799), (67, 15814), (72, 15868),

Gene: Tillicus\_24 Start: 15652, Stop: 16149, Start Num: 7

Candidate Starts for Tillicus\_24:

(Start: 7 @15652 has 42 MA's), (18, 15757), (19, 15763), (36, 15865), (46, 15925), (65, 16030), (71, 16069), (72, 16102), (73, 16111),

Gene: Triscuit\_47 Start: 24305, Stop: 24910, Start Num: 7

Candidate Starts for Triscuit\_47:

(Start: 7 @24305 has 42 MA's), (17, 24422), (27, 24503), (30, 24533), (32, 24563), (35, 24581), (36, 24584), (38, 24593), (45, 24638), (48, 24659), (72, 24839),

Gene: Troll4\_25 Start: 15487, Stop: 16140, Start Num: 3

Candidate Starts for Troll4\_25:

(Start: 3 @15487 has 23 MA's), (20, 15742), (27, 15790), (28, 15802), (47, 15904), (48, 15913), (55, 15943), (65, 16015), (68, 16033), (70, 16045), (71, 16060), (72, 16093),

Gene: Visconti\_25 Start: 15496, Stop: 16149, Start Num: 3

Candidate Starts for Visconti\_25:

(Start: 3 @15496 has 23 MA's), (20, 15751), (27, 15799), (28, 15811), (47, 15913), (48, 15922), (55, 15952), (65, 16024), (68, 16042), (70, 16054), (71, 16069), (72, 16102),

Gene: WaldoWhy\_26 Start: 15492, Stop: 16145, Start Num: 3

Candidate Starts for WaldoWhy\_26:

(Start: 3 @15492 has 23 MA's), (20, 15747), (27, 15795), (28, 15807), (47, 15909), (48, 15918), (55, 15948), (65, 16020), (68, 16038), (70, 16050), (71, 16065), (72, 16098),

Gene: Wojtek\_24 Start: 15980, Stop: 16456, Start Num: 7

Candidate Starts for Wojtek\_24:

(Start: 7 @15980 has 42 MA's), (19, 16076), (46, 16232), (48, 16244), (65, 16337), (67, 16352), (71, 16376), (72, 16409), (73, 16418),

Gene: Wollypog\_15 Start: 10559, Stop: 11137, Start Num: 8

Candidate Starts for Wollypog\_15:

(Start: 8 @10559 has 21 MA's), (19, 10679), (41, 10859), (42, 10862), (45, 10889), (50, 10919), (56, 10940), (62, 10991), (72, 11090),

Gene: Xenia2\_25 Start: 16000, Stop: 16494, Start Num: 7

Candidate Starts for Xenia2\_25:

(Start: 7 @16000 has 42 MA's), (19, 16108), (48, 16282), (49, 16285), (54, 16297), (65, 16375), (70, 16405), (71, 16414), (73, 16456), (75, 16480),

Gene: Yikes\_26 Start: 17364, Stop: 17840, Start Num: 7

Candidate Starts for Yikes\_26:

(Start: 7 @17364 has 42 MA's), (19, 17460), (46, 17616), (47, 17619), (48, 17628), (65, 17721), (67, 17736), (71, 17760), (72, 17793), (73, 17802),

Gene: Zany\_23 Start: 16493, Stop: 16969, Start Num: 7

Candidate Starts for Zany\_23:

(Start: 7 @16493 has 42 MA's), (19, 16589), (46, 16745), (47, 16748), (48, 16757), (65, 16850), (67, 16865), (71, 16889), (72, 16922), (73, 16931),