





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 296396 Report

This analysis was run 04/25/26 on database version 644.

Pham number 296396 has 113 members, 24 are drafts.

Phages represented in each track:

- Track 1 : EastWest\_78
- Track 2 : Jawnski\_68, Brent\_69, Franzy\_67
- Track 3 : Piccoletto\_69, NathanVaag\_68
- Track 4 : King2\_67
- Track 5 : Beans\_68
- Track 6 : GravityBall\_72, Timinator\_73, LeeroyJ\_73, BigDome\_72, StevieBAY\_73, BarretLemon\_72
- Track 7 : TaeYoung\_73, Grekaycon\_73, Martha\_72
- Track 8 : JKerns\_72, Shade\_72, Sonny\_72, Jordan\_73, Zartrosa\_74
- Track 9 : Wyborn\_73, Sicarius2\_74
- Track 10 : BossLady\_74
- Track 11 : Pippa\_73
- Track 12 : Abba\_67, Nostromo\_67
- Track 13 : Saronaya\_86, StorminNorm\_85, Gaea\_85, Gustavo\_86
- Track 14 : Stichling\_80, Kroos\_84, YorkOnyx\_83, Derg\_77, Ribeye\_84, Tycho\_84, Tangerine\_84, Ashertheman\_84, Bizzy\_84, LilHam\_78, Flatwoods\_84, JKSyngboy\_81, SchottB\_83, Kwobi\_86
- Track 15 : Baumdotcom\_83
- Track 16 : Belphegor\_82
- Track 17 : GTE6\_86, Twonlo\_84, RoadKill\_84, Tiamoceli\_80, EdmundFerry\_85, Dextert\_82, Chickadee\_87, Kwekel\_87
- Track 18 : BigHunkinEater\_88, Zitch\_90
- Track 19 : DoctorFroggo\_88, Verity\_87, Zipp\_88, Delrey21\_88
- Track 20 : Natkenzie\_88, Sampson\_90, Abblin\_88, Scioto\_88
- Track 21 : APunk\_88
- Track 22 : Tardus\_90
- Track 23 : ViaConlectus\_87
- Track 24 : Pumpkiney\_88
- Track 25 : Kozie\_64
- Track 26 : Cressida\_67
- Track 27 : Margaery\_63
- Track 28 : Terij\_64
- Track 29 : Sonali\_93, Maruru\_94
- Track 30 : Mufasa8\_98
- Track 31 : Altadena\_68
- Track 32 : Klevey\_74
- Track 33 : Circuit\_68

- Track 34 : Gooberta\_77, GoldDust\_76, Music\_81
- Track 35 : Divya\_87
- Track 36 : AirForce1\_86, SunnyJune\_88, Jinkies\_84
- Track 37 : Vibaki\_78
- Track 38 : Orkz\_88
- Track 39 : Vitus\_81
- Track 40 : Hirko\_79
- Track 41 : Bush\_53, Violeta\_54, Carrillo\_54, Jakelyne\_55, MenE\_54
- Track 42 : Antuna\_54, Losacky\_54
- Track 43 : Winchester007\_68, Guzman\_52, CookieDog\_52, Dropshot\_52, Appa\_52, PhillyJawn\_53
- Track 44 : NCRodriguez\_54
- Track 45 : Phonegingi\_52
- Track 46 : Warren\_52
- Track 47 : Mariel\_55
- Track 48 : Phingu\_55
- Track 49 : Pickles13\_51
- Track 50 : ScoobySnack\_49
- Track 51 : Blett\_52
- Track 52 : Jace\_90

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

The start number called the most often in the published annotations is 26, it was called in 30 of the 89 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Abba\_67, AirForce1\_86, BarretLemon\_72, Beans\_68, BigDome\_72, Brent\_69, Divya\_87, EastWest\_78, Franzy\_67, GoldDust\_76, Gooberta\_77, GravityBall\_72, Grekaycon\_73, Hirko\_79, JKerns\_72, Jawnski\_68, Jinkies\_84, Jordan\_73, King2\_67, LeeroyJ\_73, Martha\_72, Music\_81, NathanVaag\_68, Nostromo\_67, Orkz\_88, Piccoletto\_69, Shade\_72, Sicarius2\_74, Sonny\_72, StevieBAY\_73, SunnyJune\_88, TaeYoung\_73, Timinator\_73, Vibaki\_78, Vitus\_81, Wyborn\_73, Zartrosa\_74,

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

- BossLady\_74, Maruru\_94, Pippa\_73, Sonali\_93,

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

- APunk\_88, Abblin\_88, Altadena\_68, Antuna\_54, Appa\_52, Ashertheman\_84, Baumdotcom\_83, Belphegor\_82, BigHunkinEater\_88, Bizzy\_84, Blett\_52, Bush\_53, Carrillo\_54, Chickadee\_87, Circuit\_68, CookieDog\_52, Cressida\_67, Delrey21\_88, Derg\_77, Dxdert\_82, DoctorFroggo\_88, Dropshot\_52, EdmundFerry\_85, Flatwoods\_84, GTE6\_86, Gaea\_85, Gustavo\_86, Guzman\_52, JKSyngboy\_81, Jace\_90, Jakelyne\_55, Klevey\_74, Kozie\_64, Kroos\_84, Kwekel\_87, Kwobi\_86, LilHam\_78, Losacky\_54, Margaery\_63, Mariel\_55, MenE\_54, Mufasa8\_98, NCRodriguez\_54, Natkenzie\_88, PhillyJawn\_53, Phingu\_55, Phonegingi\_52, Pickles13\_51, Pumpkiney\_88, Ribeye\_84, RoadKill\_84, Sampson\_90, Saronaya\_86, SchottB\_83, Scioto\_88, ScoobySnack\_49, Stichling\_80, StorminNorm\_85, Tangerine\_84, Tardus\_90, Terij\_64, Tiamoceli\_80, Twonlo\_84, Tycho\_84, Verity\_87, ViaConlectus\_87, Violeta\_54, Warren\_52, Winchester007\_68, YorkOnyx\_83,

Zipp\_88, Zitch\_90,

### Summary by start number:

#### Start 18:

- Found in 1 of 113 ( 0.9% ) of genes in pham
- Manual Annotations of this start: 1 of 89
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Mufasa8\_98 (FG),

#### Start 21:

- Found in 2 of 113 ( 1.8% ) of genes in pham
- Manual Annotations of this start: 2 of 89
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Maruru\_94 (FG), Sonali\_93 (FG),

#### Start 23:

- Found in 1 of 113 ( 0.9% ) of genes in pham
- Manual Annotations of this start: 1 of 89
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Jace\_90 (singleton),

#### Start 25:

- Found in 21 of 113 ( 18.6% ) of genes in pham
- Manual Annotations of this start: 9 of 89
- Called 85.7% of time when present
- Phage (with cluster) where this start called: Appa\_52 (GA), Blett\_52 (GA), Bush\_53 (GA), Carrillo\_54 (GA), CookieDog\_52 (GA), Dropshot\_52 (GA), Guzman\_52 (GA), Jakelyne\_55 (GA), Mariel\_55 (GA), MenE\_54 (GA), NCRodriguez\_54 (GA), PhillyJawn\_53 (GA), Phingu\_55 (GA), Phonegingi\_52 (GA), Pickles13\_51 (GA), Violeta\_54 (GA), Warren\_52 (GA), Winchester007\_68 (GA),

#### Start 26:

- Found in 41 of 113 ( 36.3% ) of genes in pham
- Manual Annotations of this start: 30 of 89
- Called 90.2% of time when present
- Phage (with cluster) where this start called: Abba\_67 (AO3), AirForce1\_86 (FL), BarretLemon\_72 (AO2), Beans\_68 (AO1), BigDome\_72 (AO2), Brent\_69 (AO1), Divya\_87 (FL), EastWest\_78 (AO), Franzy\_67 (AO1), GoldDust\_76 (FL), Gooberta\_77 (FL), GravityBall\_72 (AO2), Grekaycon\_73 (AO2), Hirko\_79 (FL), JKerns\_72 (AO2), Jawnski\_68 (AO1), Jinkies\_84 (FL), Jordan\_73 (AO2), King2\_67 (AO1), LeeroyJ\_73 (AO2), Martha\_72 (AO2), Music\_81 (FL), NathanVaag\_68 (AO1), Nostromo\_67 (AO3), Orkz\_88 (FL), Piccoletto\_69 (AO1), Shade\_72 (AO2), Sicarius2\_74 (AO2), Sonny\_72 (AO2), StevieBAY\_73 (AO2), SunnyJune\_88 (FL), TaeYoung\_73 (AO2), Timinator\_73 (AO2), Vibaki\_78 (FL), Vitus\_81 (FL), Wyborn\_73 (AO2), Zartrosa\_74 (AO2),

#### Start 27:

- Found in 21 of 113 ( 18.6% ) of genes in pham
- Manual Annotations of this start: 2 of 89
- Called 14.3% of time when present
- Phage (with cluster) where this start called: Antuna\_54 (GA), Losacky\_54 (GA), ScoobySnack\_49 (GA),

Start 30:

- Found in 2 of 113 ( 1.8% ) of genes in pham
- Manual Annotations of this start: 2 of 89
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Altadena\_68 (FH), Circuit\_68 (FH),

Start 31:

- Found in 19 of 113 ( 16.8% ) of genes in pham
- Manual Annotations of this start: 13 of 89
- Called 94.7% of time when present
- Phage (with cluster) where this start called: APunk\_88 (DE4), Abblin\_88 (DE4), BigHunkinEater\_88 (DE4), Cressida\_67 (EI), Delrey21\_88 (DE4), DoctorFroggo\_88 (DE4), Kozie\_64 (EI), Margaery\_63 (EI), Natkenzie\_88 (DE4), Pumpkiney\_88 (DE4), Sampson\_90 (DE4), Scioto\_88 (DE4), Tardus\_90 (DE4), Terij\_64 (EI), Verity\_87 (DE4), ViaConlectus\_87 (DE4), Zipp\_88 (DE4), Zitch\_90 (DE4),

Start 32:

- Found in 1 of 113 ( 0.9% ) of genes in pham
- Manual Annotations of this start: 1 of 89
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Belphegor\_82 (DE2),

Start 33:

- Found in 27 of 113 ( 23.9% ) of genes in pham
- Manual Annotations of this start: 25 of 89
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Ashertheman\_84 (DE1), Baumdotcom\_83 (DE1), Bizzy\_84 (DE1), Chickadee\_87 (DE3), Derg\_77 (DE1), Dextert\_82 (DE3), EdmundFerry\_85 (DE3), Flatwoods\_84 (DE1), GTE6\_86 (DE3), Gaea\_85 (DE1), Gustavo\_86 (DE1), JKSyngboy\_81 (DE1), Kroos\_84 (DE1), Kwekel\_87 (DE3), Kwobi\_86 (DE1), LilHam\_78 (DE1), Ribeye\_84 (DE1), RoadKill\_84 (DE3), Saronaya\_86 (DE1), SchottB\_83 (DE1), Stichling\_80 (DE1), StorminNorm\_85 (DE1), Tangerine\_84 (DE1), Tiamoceli\_80 (DE3), Twonlo\_84 (DE3), Tycho\_84 (DE1), YorkOnyx\_83 (DE1),

Start 34:

- Found in 1 of 113 ( 0.9% ) of genes in pham
- Manual Annotations of this start: 1 of 89
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Klevey\_74 (FH),

Start 37:

- Found in 12 of 113 ( 10.6% ) of genes in pham
- Manual Annotations of this start: 2 of 89
- Called 16.7% of time when present
- Phage (with cluster) where this start called: BossLady\_74 (AO2), Pippa\_73 (AO2),

**Summary by clusters:**

There are 14 clusters represented in this pham: singleton, EI, AO1, DE1, DE2, DE3, DE4, AO, AO3, AO2, GA, FG, FH, FL,

Info for manual annotations of cluster AO:

- Start number 26 was manually annotated 1 time for cluster AO.

Info for manual annotations of cluster AO1:

- Start number 26 was manually annotated 7 times for cluster AO1.

Info for manual annotations of cluster AO2:

- Start number 26 was manually annotated 15 times for cluster AO2.
- Start number 37 was manually annotated 2 times for cluster AO2.

Info for manual annotations of cluster AO3:

- Start number 26 was manually annotated 2 times for cluster AO3.

Info for manual annotations of cluster DE1:

- Start number 33 was manually annotated 18 times for cluster DE1.

Info for manual annotations of cluster DE2:

- Start number 32 was manually annotated 1 time for cluster DE2.

Info for manual annotations of cluster DE3:

- Start number 33 was manually annotated 7 times for cluster DE3.

Info for manual annotations of cluster DE4:

- Start number 31 was manually annotated 9 times for cluster DE4.

Info for manual annotations of cluster EI:

- Start number 31 was manually annotated 4 times for cluster EI.

Info for manual annotations of cluster FG:

- Start number 18 was manually annotated 1 time for cluster FG.
- Start number 21 was manually annotated 2 times for cluster FG.

Info for manual annotations of cluster FH:

- Start number 30 was manually annotated 2 times for cluster FH.
- Start number 34 was manually annotated 1 time for cluster FH.

Info for manual annotations of cluster FL:

- Start number 26 was manually annotated 5 times for cluster FL.

Info for manual annotations of cluster GA:

- Start number 25 was manually annotated 9 times for cluster GA.
- Start number 27 was manually annotated 2 times for cluster GA.

### ***Gene Information:***

Gene: APunk\_88 Start: 58714, Stop: 58983, Start Num: 31

Candidate Starts for APunk\_88:

(20, 58669), (Start: 31 @58714 has 13 MA's), (36, 58732), (43, 58783), (49, 58861),

Gene: Abba\_67 Start: 42825, Stop: 42538, Start Num: 26

Candidate Starts for Abba\_67:

(Start: 26 @42825 has 30 MA's), (54, 42639), (62, 42555),

Gene: Abblin\_88 Start: 58873, Stop: 59145, Start Num: 31

Candidate Starts for Abblin\_88:

(6, 58672), (7, 58681), (9, 58693), (10, 58699), (Start: 31 @58873 has 13 MA's), (43, 58942), (49, 59020),

Gene: AirForce1\_86 Start: 47421, Stop: 47104, Start Num: 26

Candidate Starts for AirForce1\_86:

(12, 47577), (16, 47475), (Start: 26 @47421 has 30 MA's), (58, 47154),

Gene: Altadena\_68 Start: 43198, Stop: 42947, Start Num: 30

Candidate Starts for Altadena\_68:

(Start: 30 @43198 has 2 MA's), (57, 42994),

Gene: Antuna\_54 Start: 32652, Stop: 32918, Start Num: 27

Candidate Starts for Antuna\_54:

(13, 32508), (Start: 25 @32643 has 9 MA's), (Start: 27 @32652 has 2 MA's), (39, 32709), (43, 32733), (44, 32739), (54, 32832),

Gene: Appa\_52 Start: 32408, Stop: 32683, Start Num: 25

Candidate Starts for Appa\_52:

(3, 32012), (4, 32087), (13, 32273), (Start: 25 @32408 has 9 MA's), (Start: 27 @32417 has 2 MA's), (39, 32474), (43, 32498), (44, 32504), (54, 32597),

Gene: Ashertheman\_84 Start: 56563, Stop: 56823, Start Num: 33

Candidate Starts for Ashertheman\_84:

(Start: 33 @56563 has 25 MA's), (43, 56626), (49, 56707), (54, 56746),

Gene: BarretLemon\_72 Start: 46543, Stop: 46214, Start Num: 26

Candidate Starts for BarretLemon\_72:

(Start: 26 @46543 has 30 MA's),

Gene: Baumdotcom\_83 Start: 56963, Stop: 57223, Start Num: 33

Candidate Starts for Baumdotcom\_83:

(Start: 33 @56963 has 25 MA's), (43, 57026), (49, 57107), (54, 57146),

Gene: Beans\_68 Start: 45863, Stop: 45561, Start Num: 26

Candidate Starts for Beans\_68:

(Start: 26 @45863 has 30 MA's), (43, 45794), (56, 45656),

Gene: Belphegor\_82 Start: 58991, Stop: 59245, Start Num: 32

Candidate Starts for Belphegor\_82:

(Start: 32 @58991 has 1 MA's), (43, 59057), (49, 59135), (53, 59168),

Gene: BigDome\_72 Start: 46718, Stop: 46389, Start Num: 26

Candidate Starts for BigDome\_72:

(Start: 26 @46718 has 30 MA's),

Gene: BigHunkinEater\_88 Start: 58349, Stop: 58618, Start Num: 31

Candidate Starts for BigHunkinEater\_88:

(Start: 31 @58349 has 13 MA's), (36, 58367), (43, 58418), (49, 58496),

Gene: Bizzy\_84 Start: 56320, Stop: 56580, Start Num: 33  
Candidate Starts for Bizzy\_84:  
(Start: 33 @56320 has 25 MA's), (43, 56383), (49, 56464), (54, 56503),

Gene: Blett\_52 Start: 32593, Stop: 32868, Start Num: 25  
Candidate Starts for Blett\_52:  
(1, 32110), (2, 32137), (13, 32458), (Start: 25 @32593 has 9 MA's), (Start: 27 @32602 has 2 MA's),  
(39, 32659), (43, 32683), (44, 32689), (54, 32782),

Gene: BossLady\_74 Start: 47057, Stop: 46746, Start Num: 37  
Candidate Starts for BossLady\_74:  
(Start: 26 @47078 has 30 MA's), (Start: 37 @47057 has 2 MA's), (43, 47009), (60, 46814),

Gene: Brent\_69 Start: 46039, Stop: 45731, Start Num: 26  
Candidate Starts for Brent\_69:  
(Start: 26 @46039 has 30 MA's), (38, 46000), (43, 45964),

Gene: Bush\_53 Start: 32542, Stop: 32817, Start Num: 25  
Candidate Starts for Bush\_53:  
(13, 32407), (Start: 25 @32542 has 9 MA's), (Start: 27 @32551 has 2 MA's), (39, 32608), (43, 32632),  
(44, 32638), (54, 32731),

Gene: Carrillo\_54 Start: 32516, Stop: 32791, Start Num: 25  
Candidate Starts for Carrillo\_54:  
(13, 32381), (Start: 25 @32516 has 9 MA's), (Start: 27 @32525 has 2 MA's), (39, 32582), (43, 32606),  
(44, 32612), (54, 32705),

Gene: Chickadee\_87 Start: 56050, Stop: 56301, Start Num: 33  
Candidate Starts for Chickadee\_87:  
(Start: 33 @56050 has 25 MA's), (39, 56089), (43, 56113), (46, 56173), (56, 56248),

Gene: Circuit\_68 Start: 44623, Stop: 44378, Start Num: 30  
Candidate Starts for Circuit\_68:  
(5, 44824), (8, 44797), (Start: 30 @44623 has 2 MA's), (57, 44425),

Gene: CookieDog\_52 Start: 32516, Stop: 32791, Start Num: 25  
Candidate Starts for CookieDog\_52:  
(3, 32120), (4, 32195), (13, 32381), (Start: 25 @32516 has 9 MA's), (Start: 27 @32525 has 2 MA's),  
(39, 32582), (43, 32606), (44, 32612), (54, 32705),

Gene: Cressida\_67 Start: 42667, Stop: 42879, Start Num: 31  
Candidate Starts for Cressida\_67:  
(Start: 31 @42667 has 13 MA's), (39, 42709), (50, 42796), (54, 42832),

Gene: Delrey21\_88 Start: 60349, Stop: 60621, Start Num: 31  
Candidate Starts for Delrey21\_88:  
(20, 60304), (Start: 31 @60349 has 13 MA's), (36, 60367), (43, 60418), (49, 60496), (55, 60544),

Gene: Derg\_77 Start: 55217, Stop: 55477, Start Num: 33  
Candidate Starts for Derg\_77:  
(Start: 33 @55217 has 25 MA's), (43, 55280), (49, 55361), (54, 55400),

Gene: Dxdert\_82 Start: 54559, Stop: 54810, Start Num: 33

Candidate Starts for DEXDERT\_82:

(Start: 33 @54559 has 25 MA's), (39, 54598), (43, 54622), (46, 54682), (56, 54757),

Gene: Divya\_87 Start: 47623, Stop: 47318, Start Num: 26

Candidate Starts for Divya\_87:

(Start: 26 @47623 has 30 MA's), (36, 47596), (42, 47554), (57, 47395), (58, 47368),

Gene: DoctorFroggo\_88 Start: 60349, Stop: 60621, Start Num: 31

Candidate Starts for DoctorFroggo\_88:

(20, 60304), (Start: 31 @60349 has 13 MA's), (36, 60367), (43, 60418), (49, 60496), (55, 60544),

Gene: Dropshot\_52 Start: 32243, Stop: 32518, Start Num: 25

Candidate Starts for Dropshot\_52:

(3, 31847), (4, 31922), (13, 32108), (Start: 25 @32243 has 9 MA's), (Start: 27 @32252 has 2 MA's), (39, 32309), (43, 32333), (44, 32339), (54, 32432),

Gene: EastWest\_78 Start: 46071, Stop: 45799, Start Num: 26

Candidate Starts for EastWest\_78:

(Start: 26 @46071 has 30 MA's), (43, 46002), (48, 45927), (57, 45852),

Gene: EdmundFerry\_85 Start: 55426, Stop: 55677, Start Num: 33

Candidate Starts for EdmundFerry\_85:

(Start: 33 @55426 has 25 MA's), (39, 55465), (43, 55489), (46, 55549), (56, 55624),

Gene: Flatwoods\_84 Start: 56131, Stop: 56391, Start Num: 33

Candidate Starts for Flatwoods\_84:

(Start: 33 @56131 has 25 MA's), (43, 56194), (49, 56275), (54, 56314),

Gene: Franzy\_67 Start: 46121, Stop: 45813, Start Num: 26

Candidate Starts for Franzy\_67:

(Start: 26 @46121 has 30 MA's), (38, 46082), (43, 46046),

Gene: GTE6\_86 Start: 56599, Stop: 56850, Start Num: 33

Candidate Starts for GTE6\_86:

(Start: 33 @56599 has 25 MA's), (39, 56638), (43, 56662), (46, 56722), (56, 56797),

Gene: Gaea\_85 Start: 56481, Stop: 56741, Start Num: 33

Candidate Starts for Gaea\_85:

(Start: 33 @56481 has 25 MA's), (43, 56544), (49, 56625),

Gene: GoldDust\_76 Start: 48481, Stop: 48173, Start Num: 26

Candidate Starts for GoldDust\_76:

(Start: 26 @48481 has 30 MA's), (47, 48340), (51, 48310), (61, 48211), (64, 48196),

Gene: Gooberta\_77 Start: 49208, Stop: 48900, Start Num: 26

Candidate Starts for Gooberta\_77:

(Start: 26 @49208 has 30 MA's), (47, 49067), (51, 49037), (61, 48938), (64, 48923),

Gene: GravityBall\_72 Start: 46734, Stop: 46405, Start Num: 26

Candidate Starts for GravityBall\_72:

(Start: 26 @46734 has 30 MA's),

Gene: Grekaycon\_73 Start: 46991, Stop: 46659, Start Num: 26

Candidate Starts for Grekaycon\_73:

(Start: 26 @46991 has 30 MA's), (Start: 37 @46970 has 2 MA's), (43, 46922), (60, 46727),

Gene: Gustavo\_86 Start: 57313, Stop: 57573, Start Num: 33

Candidate Starts for Gustavo\_86:

(Start: 33 @57313 has 25 MA's), (43, 57376), (49, 57457),

Gene: Guzman\_52 Start: 32499, Stop: 32774, Start Num: 25

Candidate Starts for Guzman\_52:

(3, 32103), (4, 32178), (13, 32364), (Start: 25 @32499 has 9 MA's), (Start: 27 @32508 has 2 MA's), (39, 32565), (43, 32589), (44, 32595), (54, 32688),

Gene: Hirko\_79 Start: 48513, Stop: 48205, Start Num: 26

Candidate Starts for Hirko\_79:

(Start: 26 @48513 has 30 MA's),

Gene: JKSyngboy\_81 Start: 56985, Stop: 57245, Start Num: 33

Candidate Starts for JKSyngboy\_81:

(Start: 33 @56985 has 25 MA's), (43, 57048), (49, 57129), (54, 57168),

Gene: JKerns\_72 Start: 46983, Stop: 46651, Start Num: 26

Candidate Starts for JKerns\_72:

(Start: 26 @46983 has 30 MA's), (Start: 37 @46962 has 2 MA's), (43, 46914),

Gene: Jace\_90 Start: 50456, Stop: 50166, Start Num: 23

Candidate Starts for Jace\_90:

(11, 50609), (Start: 23 @50456 has 1 MA's), (24, 50450), (Start: 31 @50429 has 13 MA's), (57, 50234), (59, 50192),

Gene: Jakelyne\_55 Start: 32609, Stop: 32884, Start Num: 25

Candidate Starts for Jakelyne\_55:

(13, 32474), (Start: 25 @32609 has 9 MA's), (Start: 27 @32618 has 2 MA's), (39, 32675), (43, 32699), (44, 32705), (54, 32798),

Gene: Jawnski\_68 Start: 45564, Stop: 45256, Start Num: 26

Candidate Starts for Jawnski\_68:

(Start: 26 @45564 has 30 MA's), (38, 45525), (43, 45489),

Gene: Jinkies\_84 Start: 48737, Stop: 48420, Start Num: 26

Candidate Starts for Jinkies\_84:

(12, 48893), (16, 48791), (Start: 26 @48737 has 30 MA's), (58, 48470),

Gene: Jordan\_73 Start: 47141, Stop: 46809, Start Num: 26

Candidate Starts for Jordan\_73:

(Start: 26 @47141 has 30 MA's), (Start: 37 @47120 has 2 MA's), (43, 47072),

Gene: King2\_67 Start: 46100, Stop: 45792, Start Num: 26

Candidate Starts for King2\_67:

(Start: 26 @46100 has 30 MA's), (38, 46061),

Gene: Klevey\_74 Start: 45284, Stop: 45039, Start Num: 34

Candidate Starts for Klevey\_74:

(14, 45428), (Start: 34 @45284 has 1 MA's),

Gene: Kozie\_64 Start: 42302, Stop: 42514, Start Num: 31  
Candidate Starts for Kozie\_64:  
(28, 42293), (Start: 31 @42302 has 13 MA's), (39, 42344), (50, 42431),

Gene: Kroos\_84 Start: 56981, Stop: 57241, Start Num: 33  
Candidate Starts for Kroos\_84:  
(Start: 33 @56981 has 25 MA's), (43, 57044), (49, 57125), (54, 57164),

Gene: Kwekel\_87 Start: 55963, Stop: 56214, Start Num: 33  
Candidate Starts for Kwekel\_87:  
(Start: 33 @55963 has 25 MA's), (39, 56002), (43, 56026), (46, 56086), (56, 56161),

Gene: Kwobi\_86 Start: 57490, Stop: 57750, Start Num: 33  
Candidate Starts for Kwobi\_86:  
(Start: 33 @57490 has 25 MA's), (43, 57553), (49, 57634), (54, 57673),

Gene: LeeroyJ\_73 Start: 46660, Stop: 46331, Start Num: 26  
Candidate Starts for LeeroyJ\_73:  
(Start: 26 @46660 has 30 MA's),

Gene: LilHam\_78 Start: 54602, Stop: 54862, Start Num: 33  
Candidate Starts for LilHam\_78:  
(Start: 33 @54602 has 25 MA's), (43, 54665), (49, 54746), (54, 54785),

Gene: Losacky\_54 Start: 32783, Stop: 33049, Start Num: 27  
Candidate Starts for Losacky\_54:  
(13, 32639), (Start: 25 @32774 has 9 MA's), (Start: 27 @32783 has 2 MA's), (39, 32840), (43, 32864),  
(44, 32870), (54, 32963),

Gene: Margaery\_63 Start: 42267, Stop: 42482, Start Num: 31  
Candidate Starts for Margaery\_63:  
(Start: 31 @42267 has 13 MA's), (40, 42309), (44, 42336), (45, 42381), (50, 42396),

Gene: Mariel\_55 Start: 32980, Stop: 33258, Start Num: 25  
Candidate Starts for Mariel\_55:  
(13, 32845), (Start: 25 @32980 has 9 MA's), (Start: 27 @32989 has 2 MA's), (39, 33049), (43, 33073),  
(44, 33079), (54, 33172),

Gene: Martha\_72 Start: 46927, Stop: 46595, Start Num: 26  
Candidate Starts for Martha\_72:  
(Start: 26 @46927 has 30 MA's), (Start: 37 @46906 has 2 MA's), (43, 46858), (60, 46663),

Gene: Maruru\_94 Start: 57349, Stop: 57080, Start Num: 21  
Candidate Starts for Maruru\_94:  
(Start: 21 @57349 has 2 MA's), (22, 57343), (Start: 26 @57337 has 30 MA's), (29, 57325), (35, 57310),  
(Start: 37 @57307 has 2 MA's), (41, 57274), (43, 57259),

Gene: MenE\_54 Start: 32665, Stop: 32940, Start Num: 25  
Candidate Starts for MenE\_54:  
(13, 32530), (Start: 25 @32665 has 9 MA's), (Start: 27 @32674 has 2 MA's), (39, 32731), (43, 32755),  
(44, 32761), (54, 32854),

Gene: Mufasa8\_98 Start: 57231, Stop: 56944, Start Num: 18  
Candidate Starts for Mufasa8\_98:  
(Start: 18 @57231 has 1 MA's), (19, 57222), (29, 57186), (35, 57171), (50, 57057), (52, 57039),

Gene: Music\_81 Start: 49006, Stop: 48698, Start Num: 26  
Candidate Starts for Music\_81:  
(Start: 26 @49006 has 30 MA's), (47, 48865), (51, 48835), (61, 48736), (64, 48721),

Gene: NCRodriguez\_54 Start: 32734, Stop: 33009, Start Num: 25  
Candidate Starts for NCRodriguez\_54:  
(1, 32251), (2, 32278), (13, 32599), (Start: 25 @32734 has 9 MA's), (Start: 27 @32743 has 2 MA's),  
(39, 32800), (43, 32824), (44, 32830), (54, 32923),

Gene: NathanVaag\_68 Start: 45795, Stop: 45487, Start Num: 26  
Candidate Starts for NathanVaag\_68:  
(Start: 26 @45795 has 30 MA's), (38, 45756), (43, 45720), (56, 45582),

Gene: Natkenzie\_88 Start: 58873, Stop: 59145, Start Num: 31  
Candidate Starts for Natkenzie\_88:  
(6, 58672), (7, 58681), (9, 58693), (10, 58699), (Start: 31 @58873 has 13 MA's), (43, 58942), (49,  
59020),

Gene: Nostromo\_67 Start: 43577, Stop: 43287, Start Num: 26  
Candidate Starts for Nostromo\_67:  
(Start: 26 @43577 has 30 MA's), (54, 43391), (62, 43307),

Gene: Orkz\_88 Start: 46496, Stop: 46179, Start Num: 26  
Candidate Starts for Orkz\_88:  
(16, 46550), (Start: 26 @46496 has 30 MA's), (41, 46421), (58, 46229),

Gene: PhillyJawn\_53 Start: 32405, Stop: 32680, Start Num: 25  
Candidate Starts for PhillyJawn\_53:  
(3, 32009), (4, 32084), (13, 32270), (Start: 25 @32405 has 9 MA's), (Start: 27 @32414 has 2 MA's),  
(39, 32471), (43, 32495), (44, 32501), (54, 32594),

Gene: Phingu\_55 Start: 32629, Stop: 32904, Start Num: 25  
Candidate Starts for Phingu\_55:  
(1, 32146), (2, 32173), (13, 32494), (Start: 25 @32629 has 9 MA's), (Start: 27 @32638 has 2 MA's),  
(39, 32695), (43, 32719), (44, 32725), (54, 32818),

Gene: Phonegingi\_52 Start: 32447, Stop: 32722, Start Num: 25  
Candidate Starts for Phonegingi\_52:  
(1, 31964), (2, 31991), (13, 32312), (Start: 25 @32447 has 9 MA's), (Start: 27 @32456 has 2 MA's),  
(39, 32513), (43, 32537), (44, 32543),

Gene: Piccoletto\_69 Start: 45957, Stop: 45649, Start Num: 26  
Candidate Starts for Piccoletto\_69:  
(Start: 26 @45957 has 30 MA's), (38, 45918), (43, 45882), (56, 45744),

Gene: Pickles13\_51 Start: 32723, Stop: 32998, Start Num: 25  
Candidate Starts for Pickles13\_51:  
(Start: 25 @32723 has 9 MA's), (Start: 27 @32732 has 2 MA's), (39, 32789), (43, 32813), (44, 32819),  
(54, 32912),

Gene: Pippa\_73 Start: 46951, Stop: 46640, Start Num: 37  
Candidate Starts for Pippa\_73:  
(Start: 26 @46972 has 30 MA's), (Start: 37 @46951 has 2 MA's), (43, 46903),

Gene: Pumpkiney\_88 Start: 57465, Stop: 57734, Start Num: 31  
Candidate Starts for Pumpkiney\_88:  
(6, 57261), (7, 57270), (9, 57282), (Start: 31 @57465 has 13 MA's), (43, 57534), (49, 57612),

Gene: Ribeye\_84 Start: 56456, Stop: 56716, Start Num: 33  
Candidate Starts for Ribeye\_84:  
(Start: 33 @56456 has 25 MA's), (43, 56519), (49, 56600), (54, 56639),

Gene: RoadKill\_84 Start: 55492, Stop: 55743, Start Num: 33  
Candidate Starts for RoadKill\_84:  
(Start: 33 @55492 has 25 MA's), (39, 55531), (43, 55555), (46, 55615), (56, 55690),

Gene: Sampson\_90 Start: 59024, Stop: 59296, Start Num: 31  
Candidate Starts for Sampson\_90:  
(6, 58823), (7, 58832), (9, 58844), (10, 58850), (Start: 31 @59024 has 13 MA's), (43, 59093), (49, 59171),

Gene: Saronaya\_86 Start: 57313, Stop: 57573, Start Num: 33  
Candidate Starts for Saronaya\_86:  
(Start: 33 @57313 has 25 MA's), (43, 57376), (49, 57457),

Gene: SchottB\_83 Start: 57376, Stop: 57636, Start Num: 33  
Candidate Starts for SchottB\_83:  
(Start: 33 @57376 has 25 MA's), (43, 57439), (49, 57520), (54, 57559),

Gene: Scioto\_88 Start: 58874, Stop: 59146, Start Num: 31  
Candidate Starts for Scioto\_88:  
(6, 58673), (7, 58682), (9, 58694), (10, 58700), (Start: 31 @58874 has 13 MA's), (43, 58943), (49, 59021),

Gene: ScoobySnack\_49 Start: 32220, Stop: 32489, Start Num: 27  
Candidate Starts for ScoobySnack\_49:  
(1, 31728), (2, 31755), (4, 31890), (13, 32076), (Start: 25 @32211 has 9 MA's), (Start: 27 @32220 has 2 MA's), (39, 32280), (43, 32304), (44, 32310),

Gene: Shade\_72 Start: 46747, Stop: 46415, Start Num: 26  
Candidate Starts for Shade\_72:  
(Start: 26 @46747 has 30 MA's), (Start: 37 @46726 has 2 MA's), (43, 46678),

Gene: Sicarius2\_74 Start: 44932, Stop: 44645, Start Num: 26  
Candidate Starts for Sicarius2\_74:  
(Start: 26 @44932 has 30 MA's), (39, 44884), (43, 44860), (63, 44653),

Gene: Sonali\_93 Start: 57959, Stop: 57690, Start Num: 21  
Candidate Starts for Sonali\_93:  
(Start: 21 @57959 has 2 MA's), (22, 57953), (Start: 26 @57947 has 30 MA's), (29, 57935), (35, 57920),  
(Start: 37 @57917 has 2 MA's), (41, 57884), (43, 57869),

Gene: Sonny\_72 Start: 46702, Stop: 46370, Start Num: 26  
Candidate Starts for Sonny\_72:  
(Start: 26 @46702 has 30 MA's), (Start: 37 @46681 has 2 MA's), (43, 46633),

Gene: StevieBAY\_73 Start: 46953, Stop: 46624, Start Num: 26  
Candidate Starts for StevieBAY\_73:  
(Start: 26 @46953 has 30 MA's),

Gene: Stichling\_80 Start: 55984, Stop: 56244, Start Num: 33  
Candidate Starts for Stichling\_80:  
(Start: 33 @55984 has 25 MA's), (43, 56047), (49, 56128), (54, 56167),

Gene: StorminNorm\_85 Start: 57257, Stop: 57517, Start Num: 33  
Candidate Starts for StorminNorm\_85:  
(Start: 33 @57257 has 25 MA's), (43, 57320), (49, 57401),

Gene: SunnyJune\_88 Start: 47606, Stop: 47289, Start Num: 26  
Candidate Starts for SunnyJune\_88:  
(12, 47762), (16, 47660), (Start: 26 @47606 has 30 MA's), (58, 47339),

Gene: TaeYoung\_73 Start: 46899, Stop: 46567, Start Num: 26  
Candidate Starts for TaeYoung\_73:  
(Start: 26 @46899 has 30 MA's), (Start: 37 @46878 has 2 MA's), (43, 46830), (60, 46635),

Gene: Tangerine\_84 Start: 56314, Stop: 56574, Start Num: 33  
Candidate Starts for Tangerine\_84:  
(Start: 33 @56314 has 25 MA's), (43, 56377), (49, 56458), (54, 56497),

Gene: Tardus\_90 Start: 59420, Stop: 59689, Start Num: 31  
Candidate Starts for Tardus\_90:  
(Start: 31 @59420 has 13 MA's), (43, 59489), (49, 59567),

Gene: Terij\_64 Start: 41499, Stop: 41717, Start Num: 31  
Candidate Starts for Terij\_64:  
(Start: 31 @41499 has 13 MA's), (39, 41541), (40, 41544), (44, 41571), (50, 41631), (51, 41646),

Gene: Tiamoceli\_80 Start: 55382, Stop: 55633, Start Num: 33  
Candidate Starts for Tiamoceli\_80:  
(Start: 33 @55382 has 25 MA's), (39, 55421), (43, 55445), (46, 55505), (56, 55580),

Gene: Timinator\_73 Start: 46773, Stop: 46444, Start Num: 26  
Candidate Starts for Timinator\_73:  
(Start: 26 @46773 has 30 MA's),

Gene: Twonlo\_84 Start: 56083, Stop: 56334, Start Num: 33  
Candidate Starts for Twonlo\_84:  
(Start: 33 @56083 has 25 MA's), (39, 56122), (43, 56146), (46, 56206), (56, 56281),

Gene: Tycho\_84 Start: 56791, Stop: 57051, Start Num: 33  
Candidate Starts for Tycho\_84:  
(Start: 33 @56791 has 25 MA's), (43, 56854), (49, 56935), (54, 56974),

Gene: Verity\_87 Start: 60121, Stop: 60393, Start Num: 31

Candidate Starts for Verity\_87:

(20, 60076), (Start: 31 @60121 has 13 MA's), (36, 60139), (43, 60190), (49, 60268), (55, 60316),

Gene: ViaConlectus\_87 Start: 57801, Stop: 58070, Start Num: 31

Candidate Starts for ViaConlectus\_87:

(20, 57756), (Start: 31 @57801 has 13 MA's), (36, 57819), (43, 57870), (49, 57948),

Gene: Vibaki\_78 Start: 47924, Stop: 47616, Start Num: 26

Candidate Starts for Vibaki\_78:

(Start: 26 @47924 has 30 MA's), (47, 47783), (51, 47753), (61, 47654), (64, 47639),

Gene: Violeta\_54 Start: 32507, Stop: 32782, Start Num: 25

Candidate Starts for Violeta\_54:

(13, 32372), (Start: 25 @32507 has 9 MA's), (Start: 27 @32516 has 2 MA's), (39, 32573), (43, 32597), (44, 32603), (54, 32696),

Gene: Vitus\_81 Start: 47279, Stop: 46962, Start Num: 26

Candidate Starts for Vitus\_81:

(15, 47342), (17, 47330), (Start: 26 @47279 has 30 MA's), (47, 47132), (58, 47024),

Gene: Warren\_52 Start: 32462, Stop: 32737, Start Num: 25

Candidate Starts for Warren\_52:

(Start: 25 @32462 has 9 MA's), (Start: 27 @32471 has 2 MA's), (39, 32528), (43, 32552), (44, 32558), (54, 32651),

Gene: Winchester007\_68 Start: 38187, Stop: 38462, Start Num: 25

Candidate Starts for Winchester007\_68:

(3, 37791), (4, 37866), (13, 38052), (Start: 25 @38187 has 9 MA's), (Start: 27 @38196 has 2 MA's), (39, 38253), (43, 38277), (44, 38283), (54, 38376),

Gene: Wyborn\_73 Start: 45667, Stop: 45380, Start Num: 26

Candidate Starts for Wyborn\_73:

(Start: 26 @45667 has 30 MA's), (39, 45619), (43, 45595), (63, 45388),

Gene: YorkOnyx\_83 Start: 56426, Stop: 56686, Start Num: 33

Candidate Starts for YorkOnyx\_83:

(Start: 33 @56426 has 25 MA's), (43, 56489), (49, 56570), (54, 56609),

Gene: Zartrosa\_74 Start: 46999, Stop: 46667, Start Num: 26

Candidate Starts for Zartrosa\_74:

(Start: 26 @46999 has 30 MA's), (Start: 37 @46978 has 2 MA's), (43, 46930),

Gene: Zipp\_88 Start: 60092, Stop: 60364, Start Num: 31

Candidate Starts for Zipp\_88:

(20, 60047), (Start: 31 @60092 has 13 MA's), (36, 60110), (43, 60161), (49, 60239), (55, 60287),

Gene: Zitch\_90 Start: 58345, Stop: 58614, Start Num: 31

Candidate Starts for Zitch\_90:

(Start: 31 @58345 has 13 MA's), (36, 58363), (43, 58414), (49, 58492),