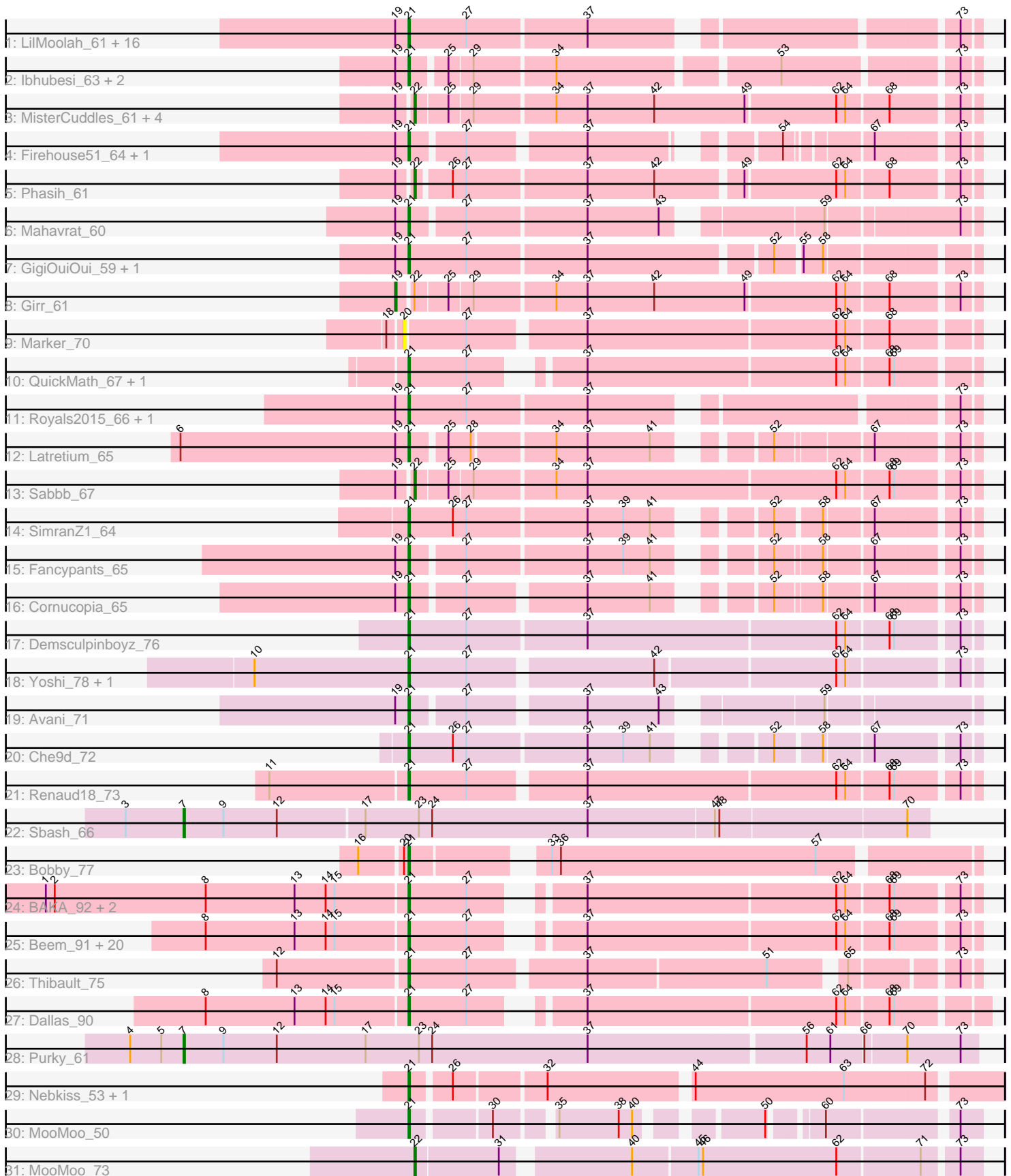


# Pham 163549



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 163549 Report

This analysis was run 05/04/24 on database version 560.

Pham number 163549 has 81 members, 5 are drafts.

Phages represented in each track:

- Track 1 : LilMoolah\_61, Che8\_68, Job42\_65, James\_67, Eradicator\_56, Mattes\_67, BuzzLyseyear\_69, Lizziana\_69, Nivrat\_59, Philus\_66, Saal\_65, Yorick\_62, GUmbie\_61, Guppsters\_63, Gorge\_67, OlympiaSaint\_65, DRBy19\_66
- Track 2 : lbhubesi\_63, LunaBlu\_65, Galactic\_62
- Track 3 : MisterCuddles\_61, Zerg\_63, Ruby\_59, Doug\_65, RockyHorror\_64
- Track 4 : Firehouse51\_64, Mutaforma13\_67
- Track 5 : Phasih\_61
- Track 6 : Mahavrat\_60
- Track 7 : GigiOuiOui\_59, Soul22\_69
- Track 8 : Girr\_61
- Track 9 : Marker\_70
- Track 10 : QuickMath\_67, Kimberlium\_68
- Track 11 : Royals2015\_66, Pollywog\_64
- Track 12 : Latretium\_65
- Track 13 : Sabbb\_67
- Track 14 : SimranZ1\_64
- Track 15 : Fancypants\_65
- Track 16 : Cornucopia\_65
- Track 17 : Demsculpinboyz\_76
- Track 18 : Yoshi\_78, ThetaBob\_70
- Track 19 : Avani\_71
- Track 20 : Che9d\_72
- Track 21 : Renaud18\_73
- Track 22 : Sbash\_66
- Track 23 : Bobby\_77
- Track 24 : BAKA\_92, EricMillard\_84, Optimus\_85
- Track 25 : Beem\_91, Bagrid\_90, DmpstrDiver\_91, HokkenD\_80, Halley\_92, Kalah2\_85, Bombitas\_79, JuicyJay\_88, Odette\_89, Klein\_91, Yeet\_84, Dove\_78, Wanda\_95, Schatzie\_86, ThreeRngTarjay\_88, Constella\_76, Zelink\_88, Minerva\_90, NihilNomen\_92, Phoebus\_93, Hughesyang\_91
- Track 26 : Thibault\_75
- Track 27 : Dallas\_90
- Track 28 : Purky\_61
- Track 29 : Nebkiss\_53, Gaia\_49
- Track 30 : MooMoo\_50
- Track 31 : MooMoo\_73

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

The start number called the most often in the published annotations is 21, it was called in 65 of the 76 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Avani\_71, BAKA\_92, Bagrid\_90, Beem\_91, Bobby\_77, Bombitas\_79, BuzzLyseyear\_69, Che8\_68, Che9d\_72, Constella\_76, Cornucopia\_65, DRBy19\_66, Dallas\_90, Demsculpinboyz\_76, DmpstrDiver\_91, Dove\_78, Eradicator\_56, EricMillard\_84, Fancypants\_65, Firehouse51\_64, GUmbie\_61, Gaia\_49, Galactic\_62, GigiOuiOui\_59, Gorge\_67, Guppsters\_63, Halley\_92, HokkenD\_80, Hughesyang\_91, Ibhubesi\_63, James\_67, Job42\_65, JuicyJay\_88, Kalah2\_85, Kimberlium\_68, Klein\_91, Latretium\_65, LilMoolah\_61, Lizziana\_69, LunaBlu\_65, Mahavrat\_60, Mattes\_67, Minerva\_90, MooMoo\_50, Mutaforma13\_67, Nebkiss\_53, NihilNomen\_92, Nivrat\_59, Odette\_89, OlympiaSaint\_65, Optimus\_85, Philus\_66, Phoebus\_93, Pollywog\_64, QuickMath\_67, Renaud18\_73, Royals2015\_66, Saal\_65, Schatzie\_86, SimranZ1\_64, Soul22\_69, ThetaBob\_70, Thibault\_75, ThreeRngTarjay\_88, Wanda\_95, Yeet\_84, Yorick\_62, Yoshi\_78, Zelink\_88,

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

- 

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

- Doug\_65, Girr\_61, Marker\_70, MisterCuddles\_61, MooMoo\_73, Phasih\_61, Purky\_61, RockyHorror\_64, Ruby\_59, Sabbb\_67, Sbash\_66, Zerg\_63,

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

Start 7:

- Found in 2 of 81 ( 2.5% ) of genes in pham
- Manual Annotations of this start: 2 of 76
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Purky\_61 (P6), Sbash\_66 (I2),

Start 19:

- Found in 39 of 81 ( 48.1% ) of genes in pham
- Manual Annotations of this start: 1 of 76
- Called 2.6% of time when present
- Phage (with cluster) where this start called: Girr\_61 (F1),

Start 20:

- Found in 2 of 81 ( 2.5% ) of genes in pham
- No Manual Annotations of this start.
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Marker\_70 (F1),

Start 21:

- Found in 69 of 81 ( 85.2% ) of genes in pham
- Manual Annotations of this start: 65 of 76
- Called 100.0% of time when present

- Phage (with cluster) where this start called: Avani\_71 (F2), BAKA\_92 (J), Bagrid\_90 (J), Beem\_91 (J), Bobby\_77 (J), Bombitas\_79 (J), BuzzLyseyear\_69 (F1), Che8\_68 (F1), Che9d\_72 (F2), Constella\_76 (J), Cornucopia\_65 (F1), DRBy19\_66 (F1), Dallas\_90 (J), Demsculpinboyz\_76 (F2), DmpstrDiver\_91 (J), Dove\_78 (J), Eradicator\_56 (F1), EricMillard\_84 (J), Fancypants\_65 (F1), Firehouse51\_64 (F1), GUmbie\_61 (F1), Gaia\_49 (X), Galactic\_62 (F1), GigiOuiOui\_59 (F1), Gorge\_67 (F1), Guppsters\_63 (F1), Halley\_92 (J), HokkenD\_80 (J), Hughesyang\_91 (J), Ibhubesi\_63 (F1), James\_67 (F1), Job42\_65 (F1), JuicyJay\_88 (J), Kalah2\_85 (J), Kimberlium\_68 (F1), Klein\_91 (J), Latretium\_65 (F1), LilMoolah\_61 (F1), Lizziana\_69 (F1), LunaBlu\_65 (F1), Mahavrat\_60 (F1), Mattes\_67 (F1), Minerva\_90 (J), MooMoo\_50 (singleton), Mutaforma13\_67 (F1), Nebkiss\_53 (X), NihilNomen\_92 (J), Nivrat\_59 (F1), Odette\_89 (J), OlympiaSaint\_65 (F1), Optimus\_85 (J), Philus\_66 (F1), Phoebus\_93 (J), Pollywog\_64 (F1), QuickMath\_67 (F1), Renaud18\_73 (F4), Royals2015\_66 (F1), Saal\_65 (F1), Schatzie\_86 (J), SimranZ1\_64 (F1), Soul22\_69 (F2), ThetaBob\_70 (F4), Thibault\_75 (J), ThreeRngTarjay\_88 (J), Wanda\_95 (J), Yeet\_84 (J), Yorick\_62 (F1), Yoshi\_78 (F2), Zelink\_88 (J),

Start 22:

- Found in 9 of 81 ( 11.1% ) of genes in pham
- Manual Annotations of this start: 8 of 76
- Called 88.9% of time when present
- Phage (with cluster) where this start called: Doug\_65 (F1), MisterCuddles\_61 (F1), MooMoo\_73 (singleton), Phasih\_61 (F1), RockyHorror\_64 (F1), Ruby\_59 (F1), Sabbb\_67 (F1), Zerg\_63 (F1),

### Summary by clusters:

There are 8 clusters represented in this pham: F1, F2, I2, P6, F4, J, singleton, X,

Info for manual annotations of cluster F1:

- Start number 19 was manually annotated 1 time for cluster F1.
- Start number 21 was manually annotated 31 times for cluster F1.
- Start number 22 was manually annotated 7 times for cluster F1.

Info for manual annotations of cluster F2:

- Start number 21 was manually annotated 5 times for cluster F2.

Info for manual annotations of cluster F4:

- Start number 21 was manually annotated 2 times for cluster F4.

Info for manual annotations of cluster I2:

- Start number 7 was manually annotated 1 time for cluster I2.

Info for manual annotations of cluster J:

- Start number 21 was manually annotated 24 times for cluster J.

Info for manual annotations of cluster P6:

- Start number 7 was manually annotated 1 time for cluster P6.

Info for manual annotations of cluster X:

- Start number 21 was manually annotated 2 times for cluster X.

**Gene Information:**

Gene: Avani\_71 Start: 41759, Stop: 42094, Start Num: 21

Candidate Starts for Avani\_71:

(Start: 19 @41750 has 1 MA's), (Start: 21 @41759 has 65 MA's), (27, 41792), (37, 41864), (43, 41912), (59, 41999),

Gene: BAKA\_92 Start: 57196, Stop: 57537, Start Num: 21

Candidate Starts for BAKA\_92:

(1, 56956), (2, 56962), (8, 57064), (13, 57124), (14, 57145), (15, 57151), (Start: 21 @57196 has 65 MA's), (27, 57235), (37, 57289), (62, 57451), (64, 57457), (68, 57484), (69, 57487), (73, 57526),

Gene: Bagrid\_90 Start: 56063, Stop: 56404, Start Num: 21

Candidate Starts for Bagrid\_90:

(8, 55931), (13, 55991), (14, 56012), (15, 56018), (Start: 21 @56063 has 65 MA's), (27, 56102), (37, 56156), (62, 56318), (64, 56324), (68, 56351), (69, 56354), (73, 56393),

Gene: Beem\_91 Start: 56924, Stop: 57265, Start Num: 21

Candidate Starts for Beem\_91:

(8, 56792), (13, 56852), (14, 56873), (15, 56879), (Start: 21 @56924 has 65 MA's), (27, 56963), (37, 57017), (62, 57179), (64, 57185), (68, 57212), (69, 57215), (73, 57254),

Gene: Bobby\_77 Start: 51896, Stop: 51546, Start Num: 21

Candidate Starts for Bobby\_77:

(16, 51926), (20, 51899), (Start: 21 @51896 has 65 MA's), (33, 51821), (36, 51815), (57, 51644),

Gene: Bombitas\_79 Start: 54087, Stop: 54428, Start Num: 21

Candidate Starts for Bombitas\_79:

(8, 53955), (13, 54015), (14, 54036), (15, 54042), (Start: 21 @54087 has 65 MA's), (27, 54126), (37, 54180), (62, 54342), (64, 54348), (68, 54375), (69, 54378), (73, 54417),

Gene: BuzzLyseyear\_69 Start: 42383, Stop: 42724, Start Num: 21

Candidate Starts for BuzzLyseyear\_69:

(Start: 19 @42374 has 1 MA's), (Start: 21 @42383 has 65 MA's), (27, 42422), (37, 42500), (73, 42713),

Gene: Che8\_68 Start: 43879, Stop: 44220, Start Num: 21

Candidate Starts for Che8\_68:

(Start: 19 @43870 has 1 MA's), (Start: 21 @43879 has 65 MA's), (27, 43918), (37, 43996), (73, 44209),

Gene: Che9d\_72 Start: 41100, Stop: 41432, Start Num: 21

Candidate Starts for Che9d\_72:

(Start: 21 @41100 has 65 MA's), (26, 41130), (27, 41139), (37, 41217), (39, 41241), (41, 41259), (52, 41313), (58, 41340), (67, 41370), (73, 41421),

Gene: Constella\_76 Start: 51061, Stop: 51402, Start Num: 21

Candidate Starts for Constella\_76:

(8, 50929), (13, 50989), (14, 51010), (15, 51016), (Start: 21 @51061 has 65 MA's), (27, 51100), (37, 51154), (62, 51316), (64, 51322), (68, 51349), (69, 51352), (73, 51391),

Gene: Cornucopia\_65 Start: 41687, Stop: 42007, Start Num: 21

Candidate Starts for Cornucopia\_65:

(Start: 19 @41678 has 1 MA's), (Start: 21 @41687 has 65 MA's), (27, 41720), (37, 41792), (41, 41834), (52, 41888), (58, 41915), (67, 41945), (73, 41996),

Gene: DRBy19\_66 Start: 42134, Stop: 42475, Start Num: 21

Candidate Starts for DRBy19\_66:

(Start: 19 @42125 has 1 MA's), (Start: 21 @42134 has 65 MA's), (27, 42173), (37, 42251), (73, 42464),

Gene: Dallas\_90 Start: 55845, Stop: 56192, Start Num: 21

Candidate Starts for Dallas\_90:

(8, 55713), (13, 55773), (14, 55794), (15, 55800), (Start: 21 @55845 has 65 MA's), (27, 55884), (37, 55938), (62, 56100), (64, 56106), (68, 56133), (69, 56136),

Gene: Demsculpinboyz\_76 Start: 41371, Stop: 41736, Start Num: 21

Candidate Starts for Demsculpinboyz\_76:

(Start: 21 @41371 has 65 MA's), (27, 41410), (37, 41488), (62, 41650), (64, 41656), (68, 41683), (69, 41686), (73, 41725),

Gene: DmpstrDiver\_91 Start: 56259, Stop: 56600, Start Num: 21

Candidate Starts for DmpstrDiver\_91:

(8, 56127), (13, 56187), (14, 56208), (15, 56214), (Start: 21 @56259 has 65 MA's), (27, 56298), (37, 56352), (62, 56514), (64, 56520), (68, 56547), (69, 56550), (73, 56589),

Gene: Doug\_65 Start: 41707, Stop: 42063, Start Num: 22

Candidate Starts for Doug\_65:

(Start: 19 @41698 has 1 MA's), (Start: 22 @41707 has 8 MA's), (25, 41728), (29, 41743), (34, 41794), (37, 41815), (42, 41860), (49, 41920), (62, 41977), (64, 41983), (68, 42010), (73, 42052),

Gene: Dove\_78 Start: 52353, Stop: 52694, Start Num: 21

Candidate Starts for Dove\_78:

(8, 52221), (13, 52281), (14, 52302), (15, 52308), (Start: 21 @52353 has 65 MA's), (27, 52392), (37, 52446), (62, 52608), (64, 52614), (68, 52641), (69, 52644), (73, 52683),

Gene: Eradicator\_56 Start: 39233, Stop: 39574, Start Num: 21

Candidate Starts for Eradicator\_56:

(Start: 19 @39224 has 1 MA's), (Start: 21 @39233 has 65 MA's), (27, 39272), (37, 39350), (73, 39563),

Gene: EricMillard\_84 Start: 55991, Stop: 56332, Start Num: 21

Candidate Starts for EricMillard\_84:

(1, 55751), (2, 55757), (8, 55859), (13, 55919), (14, 55940), (15, 55946), (Start: 21 @55991 has 65 MA's), (27, 56030), (37, 56084), (62, 56246), (64, 56252), (68, 56279), (69, 56282), (73, 56321),

Gene: Fancypants\_65 Start: 41674, Stop: 42000, Start Num: 21

Candidate Starts for Fancypants\_65:

(Start: 19 @41665 has 1 MA's), (Start: 21 @41674 has 65 MA's), (27, 41707), (37, 41785), (39, 41809), (41, 41827), (52, 41881), (58, 41908), (67, 41938), (73, 41989),

Gene: Firehouse51\_64 Start: 44558, Stop: 44872, Start Num: 21

Candidate Starts for Firehouse51\_64:

(Start: 19 @44549 has 1 MA's), (Start: 21 @44558 has 65 MA's), (27, 44591), (37, 44663), (54, 44762), (67, 44810), (73, 44861),

Gene: GUmbie\_61 Start: 40460, Stop: 40801, Start Num: 21

Candidate Starts for GUmbie\_61:

(Start: 19 @40451 has 1 MA's), (Start: 21 @40460 has 65 MA's), (27, 40499), (37, 40577), (73, 40790),

Gene: Gaia\_49 Start: 36916, Stop: 36548, Start Num: 21

Candidate Starts for Gaia\_49:

(Start: 21 @36916 has 65 MA's), (26, 36892), (32, 36835), (44, 36745), (63, 36646), (72, 36592),

Gene: Galactic\_62 Start: 40920, Stop: 41261, Start Num: 21

Candidate Starts for Galactic\_62:

(Start: 19 @40911 has 1 MA's), (Start: 21 @40920 has 65 MA's), (25, 40941), (29, 40956), (34, 41007), (53, 41145), (73, 41250),

Gene: GigiOuiOui\_59 Start: 39900, Stop: 40250, Start Num: 21

Candidate Starts for GigiOuiOui\_59:

(Start: 19 @39891 has 1 MA's), (Start: 21 @39900 has 65 MA's), (27, 39939), (37, 40017), (52, 40131), (55, 40146), (58, 40158),

Gene: Girr\_61 Start: 40755, Stop: 41120, Start Num: 19

Candidate Starts for Girr\_61:

(Start: 19 @40755 has 1 MA's), (Start: 22 @40764 has 8 MA's), (25, 40785), (29, 40800), (34, 40851), (37, 40872), (42, 40917), (49, 40977), (62, 41034), (64, 41040), (68, 41067), (73, 41109),

Gene: Gorge\_67 Start: 42402, Stop: 42743, Start Num: 21

Candidate Starts for Gorge\_67:

(Start: 19 @42393 has 1 MA's), (Start: 21 @42402 has 65 MA's), (27, 42441), (37, 42519), (73, 42732),

Gene: Guppsters\_63 Start: 40585, Stop: 40926, Start Num: 21

Candidate Starts for Guppsters\_63:

(Start: 19 @40576 has 1 MA's), (Start: 21 @40585 has 65 MA's), (27, 40624), (37, 40702), (73, 40915),

Gene: Halley\_92 Start: 56924, Stop: 57265, Start Num: 21

Candidate Starts for Halley\_92:

(8, 56792), (13, 56852), (14, 56873), (15, 56879), (Start: 21 @56924 has 65 MA's), (27, 56963), (37, 57017), (62, 57179), (64, 57185), (68, 57212), (69, 57215), (73, 57254),

Gene: HokkenD\_80 Start: 55193, Stop: 55534, Start Num: 21

Candidate Starts for HokkenD\_80:

(8, 55061), (13, 55121), (14, 55142), (15, 55148), (Start: 21 @55193 has 65 MA's), (27, 55232), (37, 55286), (62, 55448), (64, 55454), (68, 55481), (69, 55484), (73, 55523),

Gene: Hughesyang\_91 Start: 56882, Stop: 57223, Start Num: 21

Candidate Starts for Hughesyang\_91:

(8, 56750), (13, 56810), (14, 56831), (15, 56837), (Start: 21 @56882 has 65 MA's), (27, 56921), (37, 56975), (62, 57137), (64, 57143), (68, 57170), (69, 57173), (73, 57212),

Gene: Ibhubesi\_63 Start: 41044, Stop: 41385, Start Num: 21

Candidate Starts for Ibhubesi\_63:

(Start: 19 @41035 has 1 MA's), (Start: 21 @41044 has 65 MA's), (25, 41065), (29, 41080), (34, 41131), (53, 41269), (73, 41374),

Gene: James\_67 Start: 42527, Stop: 42868, Start Num: 21

Candidate Starts for James\_67:

(Start: 19 @42518 has 1 MA's), (Start: 21 @42527 has 65 MA's), (27, 42566), (37, 42644), (73, 42857),

Gene: Job42\_65 Start: 42942, Stop: 43283, Start Num: 21

Candidate Starts for Job42\_65:

(Start: 19 @42933 has 1 MA's), (Start: 21 @42942 has 65 MA's), (27, 42981), (37, 43059), (73, 43272),

Gene: JuicyJay\_88 Start: 58058, Stop: 58399, Start Num: 21

Candidate Starts for JuicyJay\_88:

(8, 57926), (13, 57986), (14, 58007), (15, 58013), (Start: 21 @58058 has 65 MA's), (27, 58097), (37, 58151), (62, 58313), (64, 58319), (68, 58346), (69, 58349), (73, 58388),

Gene: Kalah2\_85 Start: 56217, Stop: 56558, Start Num: 21

Candidate Starts for Kalah2\_85:

(8, 56085), (13, 56145), (14, 56166), (15, 56172), (Start: 21 @56217 has 65 MA's), (27, 56256), (37, 56310), (62, 56472), (64, 56478), (68, 56505), (69, 56508), (73, 56547),

Gene: Kimberlium\_68 Start: 43340, Stop: 43681, Start Num: 21

Candidate Starts for Kimberlium\_68:

(Start: 21 @43340 has 65 MA's), (27, 43379), (37, 43433), (62, 43595), (64, 43601), (68, 43628), (69, 43631),

Gene: Klein\_91 Start: 55893, Stop: 56234, Start Num: 21

Candidate Starts for Klein\_91:

(8, 55761), (13, 55821), (14, 55842), (15, 55848), (Start: 21 @55893 has 65 MA's), (27, 55932), (37, 55986), (62, 56148), (64, 56154), (68, 56181), (69, 56184), (73, 56223),

Gene: Latretium\_65 Start: 41581, Stop: 41904, Start Num: 21

Candidate Starts for Latretium\_65:

(6, 41428), (Start: 19 @41572 has 1 MA's), (Start: 21 @41581 has 65 MA's), (25, 41602), (28, 41617), (34, 41668), (37, 41689), (41, 41731), (52, 41785), (67, 41842), (73, 41893),

Gene: LilMoolah\_61 Start: 40447, Stop: 40788, Start Num: 21

Candidate Starts for LilMoolah\_61:

(Start: 19 @40438 has 1 MA's), (Start: 21 @40447 has 65 MA's), (27, 40486), (37, 40564), (73, 40777),

Gene: Lizziana\_69 Start: 42008, Stop: 42349, Start Num: 21

Candidate Starts for Lizziana\_69:

(Start: 19 @41999 has 1 MA's), (Start: 21 @42008 has 65 MA's), (27, 42047), (37, 42125), (73, 42338),

Gene: LunaBlu\_65 Start: 41579, Stop: 41920, Start Num: 21

Candidate Starts for LunaBlu\_65:

(Start: 19 @41570 has 1 MA's), (Start: 21 @41579 has 65 MA's), (25, 41600), (29, 41615), (34, 41666), (53, 41804), (73, 41909),

Gene: Mahavrat\_60 Start: 40518, Stop: 40859, Start Num: 21

Candidate Starts for Mahavrat\_60:



(Start: 19 @40509 has 1 MA's), (Start: 21 @40518 has 65 MA's), (27, 40551), (37, 40629), (43, 40677), (59, 40764), (73, 40848),

Gene: Marker\_70 Start: 41128, Stop: 41487, Start Num: 20

Candidate Starts for Marker\_70:

(18, 41119), (20, 41128), (27, 41167), (37, 41239), (62, 41401), (64, 41407), (68, 41434),

Gene: Mattes\_67 Start: 42527, Stop: 42868, Start Num: 21

Candidate Starts for Mattes\_67:

(Start: 19 @42518 has 1 MA's), (Start: 21 @42527 has 65 MA's), (27, 42566), (37, 42644), (73, 42857),

Gene: Minerva\_90 Start: 56841, Stop: 57182, Start Num: 21

Candidate Starts for Minerva\_90:

(8, 56709), (13, 56769), (14, 56790), (15, 56796), (Start: 21 @56841 has 65 MA's), (27, 56880), (37, 56934), (62, 57096), (64, 57102), (68, 57129), (69, 57132), (73, 57171),

Gene: MisterCuddles\_61 Start: 40764, Stop: 41120, Start Num: 22

Candidate Starts for MisterCuddles\_61:

(Start: 19 @40755 has 1 MA's), (Start: 22 @40764 has 8 MA's), (25, 40785), (29, 40800), (34, 40851), (37, 40872), (42, 40917), (49, 40977), (62, 41034), (64, 41040), (68, 41067), (73, 41109),

Gene: MooMoo\_50 Start: 36541, Stop: 36855, Start Num: 21

Candidate Starts for MooMoo\_50:

(Start: 21 @36541 has 65 MA's), (30, 36589), (35, 36622), (38, 36661), (40, 36670), (50, 36736), (60, 36763), (73, 36841),

Gene: MooMoo\_73 Start: 46091, Stop: 46441, Start Num: 22

Candidate Starts for MooMoo\_73:

(Start: 22 @46091 has 8 MA's), (31, 46145), (40, 46220), (45, 46262), (46, 46265), (62, 46352), (71, 46406), (73, 46427),

Gene: Mutaforma13\_67 Start: 43868, Stop: 44182, Start Num: 21

Candidate Starts for Mutaforma13\_67:

(Start: 19 @43859 has 1 MA's), (Start: 21 @43868 has 65 MA's), (27, 43901), (37, 43973), (54, 44072), (67, 44120), (73, 44171),

Gene: Nebkiss\_53 Start: 36617, Stop: 36249, Start Num: 21

Candidate Starts for Nebkiss\_53:

(Start: 21 @36617 has 65 MA's), (26, 36593), (32, 36536), (44, 36446), (63, 36347), (72, 36293),

Gene: NihilNomen\_92 Start: 57011, Stop: 57352, Start Num: 21

Candidate Starts for NihilNomen\_92:

(8, 56879), (13, 56939), (14, 56960), (15, 56966), (Start: 21 @57011 has 65 MA's), (27, 57050), (37, 57104), (62, 57266), (64, 57272), (68, 57299), (69, 57302), (73, 57341),

Gene: Nivrat\_59 Start: 40320, Stop: 40661, Start Num: 21

Candidate Starts for Nivrat\_59:

(Start: 19 @40311 has 1 MA's), (Start: 21 @40320 has 65 MA's), (27, 40359), (37, 40437), (73, 40650),

Gene: Odette\_89 Start: 56053, Stop: 56394, Start Num: 21

Candidate Starts for Odette\_89:

(8, 55921), (13, 55981), (14, 56002), (15, 56008), (Start: 21 @56053 has 65 MA's), (27, 56092), (37, 56146), (62, 56308), (64, 56314), (68, 56341), (69, 56344), (73, 56383),

Gene: OlympiaSaint\_65 Start: 41469, Stop: 41810, Start Num: 21

Candidate Starts for OlympiaSaint\_65:

(Start: 19 @41460 has 1 MA's), (Start: 21 @41469 has 65 MA's), (27, 41508), (37, 41586), (73, 41799),

Gene: Optimus\_85 Start: 55545, Stop: 55886, Start Num: 21

Candidate Starts for Optimus\_85:

(1, 55305), (2, 55311), (8, 55413), (13, 55473), (14, 55494), (15, 55500), (Start: 21 @55545 has 65 MA's), (27, 55584), (37, 55638), (62, 55800), (64, 55806), (68, 55833), (69, 55836), (73, 55875),

Gene: Phasih\_61 Start: 41374, Stop: 41724, Start Num: 22

Candidate Starts for Phasih\_61:

(Start: 19 @41365 has 1 MA's), (Start: 22 @41374 has 8 MA's), (26, 41395), (27, 41404), (37, 41482), (42, 41527), (49, 41581), (62, 41638), (64, 41644), (68, 41671), (73, 41713),

Gene: Philus\_66 Start: 42110, Stop: 42451, Start Num: 21

Candidate Starts for Philus\_66:

(Start: 19 @42101 has 1 MA's), (Start: 21 @42110 has 65 MA's), (27, 42149), (37, 42227), (73, 42440),

Gene: Phoebus\_93 Start: 58193, Stop: 58534, Start Num: 21

Candidate Starts for Phoebus\_93:

(8, 58061), (13, 58121), (14, 58142), (15, 58148), (Start: 21 @58193 has 65 MA's), (27, 58232), (37, 58286), (62, 58448), (64, 58454), (68, 58481), (69, 58484), (73, 58523),

Gene: Pollywog\_64 Start: 41787, Stop: 42128, Start Num: 21

Candidate Starts for Pollywog\_64:

(Start: 19 @41778 has 1 MA's), (Start: 21 @41787 has 65 MA's), (27, 41826), (37, 41904), (73, 42117),

Gene: Purky\_61 Start: 40628, Stop: 41152, Start Num: 7

Candidate Starts for Purky\_61:

(4, 40592), (5, 40613), (Start: 7 @40628 has 2 MA's), (9, 40655), (12, 40691), (17, 40751), (23, 40787), (24, 40796), (37, 40901), (56, 41042), (61, 41057), (66, 41078), (70, 41105), (73, 41141),

Gene: QuickMath\_67 Start: 43563, Stop: 43904, Start Num: 21

Candidate Starts for QuickMath\_67:

(Start: 21 @43563 has 65 MA's), (27, 43602), (37, 43656), (62, 43818), (64, 43824), (68, 43851), (69, 43854),

Gene: Renaud18\_73 Start: 42883, Stop: 43242, Start Num: 21

Candidate Starts for Renaud18\_73:

(11, 42793), (Start: 21 @42883 has 65 MA's), (27, 42922), (37, 42994), (62, 43156), (64, 43162), (68, 43189), (69, 43192), (73, 43231),

Gene: RockyHorror\_64 Start: 40636, Stop: 40992, Start Num: 22

Candidate Starts for RockyHorror\_64:

(Start: 19 @40627 has 1 MA's), (Start: 22 @40636 has 8 MA's), (25, 40657), (29, 40672), (34, 40723), (37, 40744), (42, 40789), (49, 40849), (62, 40906), (64, 40912), (68, 40939), (73, 40981),

Gene: Royals2015\_66 Start: 41205, Stop: 41546, Start Num: 21

Candidate Starts for Royals2015\_66:

(Start: 19 @41196 has 1 MA's), (Start: 21 @41205 has 65 MA's), (27, 41244), (37, 41322), (73, 41535),

Gene: Ruby\_59 Start: 40765, Stop: 41121, Start Num: 22

Candidate Starts for Ruby\_59:

(Start: 19 @40756 has 1 MA's), (Start: 22 @40765 has 8 MA's), (25, 40786), (29, 40801), (34, 40852), (37, 40873), (42, 40918), (49, 40978), (62, 41035), (64, 41041), (68, 41068), (73, 41110),

Gene: Saal\_65 Start: 42221, Stop: 42562, Start Num: 21

Candidate Starts for Saal\_65:

(Start: 19 @42212 has 1 MA's), (Start: 21 @42221 has 65 MA's), (27, 42260), (37, 42338), (73, 42551),

Gene: Sabbb\_67 Start: 41906, Stop: 42262, Start Num: 22

Candidate Starts for Sabbb\_67:

(Start: 19 @41897 has 1 MA's), (Start: 22 @41906 has 8 MA's), (25, 41927), (29, 41942), (34, 41993), (37, 42014), (62, 42176), (64, 42182), (68, 42209), (69, 42212), (73, 42251),

Gene: Sbash\_66 Start: 44659, Stop: 45153, Start Num: 7

Candidate Starts for Sbash\_66:

(3, 44620), (Start: 7 @44659 has 2 MA's), (9, 44686), (12, 44722), (17, 44779), (23, 44815), (24, 44824), (37, 44929), (47, 45013), (48, 45016), (70, 45139),

Gene: Schatzie\_86 Start: 55800, Stop: 56141, Start Num: 21

Candidate Starts for Schatzie\_86:

(8, 55668), (13, 55728), (14, 55749), (15, 55755), (Start: 21 @55800 has 65 MA's), (27, 55839), (37, 55893), (62, 56055), (64, 56061), (68, 56088), (69, 56091), (73, 56130),

Gene: SimranZ1\_64 Start: 41403, Stop: 41735, Start Num: 21

Candidate Starts for SimranZ1\_64:

(Start: 21 @41403 has 65 MA's), (26, 41433), (27, 41442), (37, 41520), (39, 41544), (41, 41562), (52, 41616), (58, 41643), (67, 41673), (73, 41724),

Gene: Soul22\_69 Start: 42555, Stop: 42905, Start Num: 21

Candidate Starts for Soul22\_69:

(Start: 19 @42546 has 1 MA's), (Start: 21 @42555 has 65 MA's), (27, 42594), (37, 42672), (52, 42786), (55, 42801), (58, 42813),

Gene: ThetaBob\_70 Start: 42862, Stop: 43218, Start Num: 21

Candidate Starts for ThetaBob\_70:

(10, 42760), (Start: 21 @42862 has 65 MA's), (27, 42901), (42, 43018), (62, 43132), (64, 43138), (73, 43207),

Gene: Thibault\_75 Start: 51674, Stop: 52018, Start Num: 21

Candidate Starts for Thibault\_75:

(12, 51590), (Start: 21 @51674 has 65 MA's), (27, 51713), (37, 51785), (51, 51902), (65, 51944), (73, 52007),

Gene: ThreeRngTarjay\_88 Start: 57085, Stop: 57426, Start Num: 21

Candidate Starts for ThreeRngTarjay\_88:

(8, 56953), (13, 57013), (14, 57034), (15, 57040), (Start: 21 @57085 has 65 MA's), (27, 57124), (37, 57178), (62, 57340), (64, 57346), (68, 57373), (69, 57376), (73, 57415),

Gene: Wanda\_95 Start: 56202, Stop: 56543, Start Num: 21

Candidate Starts for Wanda\_95:

(8, 56070), (13, 56130), (14, 56151), (15, 56157), (Start: 21 @56202 has 65 MA's), (27, 56241), (37, 56295), (62, 56457), (64, 56463), (68, 56490), (69, 56493), (73, 56532),

Gene: Yeet\_84 Start: 55302, Stop: 55643, Start Num: 21

Candidate Starts for Yeet\_84:

(8, 55170), (13, 55230), (14, 55251), (15, 55257), (Start: 21 @55302 has 65 MA's), (27, 55341), (37, 55395), (62, 55557), (64, 55563), (68, 55590), (69, 55593), (73, 55632),

Gene: Yorick\_62 Start: 41335, Stop: 41676, Start Num: 21

Candidate Starts for Yorick\_62:

(Start: 19 @41326 has 1 MA's), (Start: 21 @41335 has 65 MA's), (27, 41374), (37, 41452), (73, 41665),

Gene: Yoshi\_78 Start: 43126, Stop: 43482, Start Num: 21

Candidate Starts for Yoshi\_78:

(10, 43024), (Start: 21 @43126 has 65 MA's), (27, 43165), (42, 43282), (62, 43396), (64, 43402), (73, 43471),

Gene: Zelink\_88 Start: 57397, Stop: 57738, Start Num: 21

Candidate Starts for Zelink\_88:

(8, 57265), (13, 57325), (14, 57346), (15, 57352), (Start: 21 @57397 has 65 MA's), (27, 57436), (37, 57490), (62, 57652), (64, 57658), (68, 57685), (69, 57688), (73, 57727),

Gene: Zerg\_63 Start: 40748, Stop: 41104, Start Num: 22

Candidate Starts for Zerg\_63:

(Start: 19 @40739 has 1 MA's), (Start: 22 @40748 has 8 MA's), (25, 40769), (29, 40784), (34, 40835), (37, 40856), (42, 40901), (49, 40961), (62, 41018), (64, 41024), (68, 41051), (73, 41093),