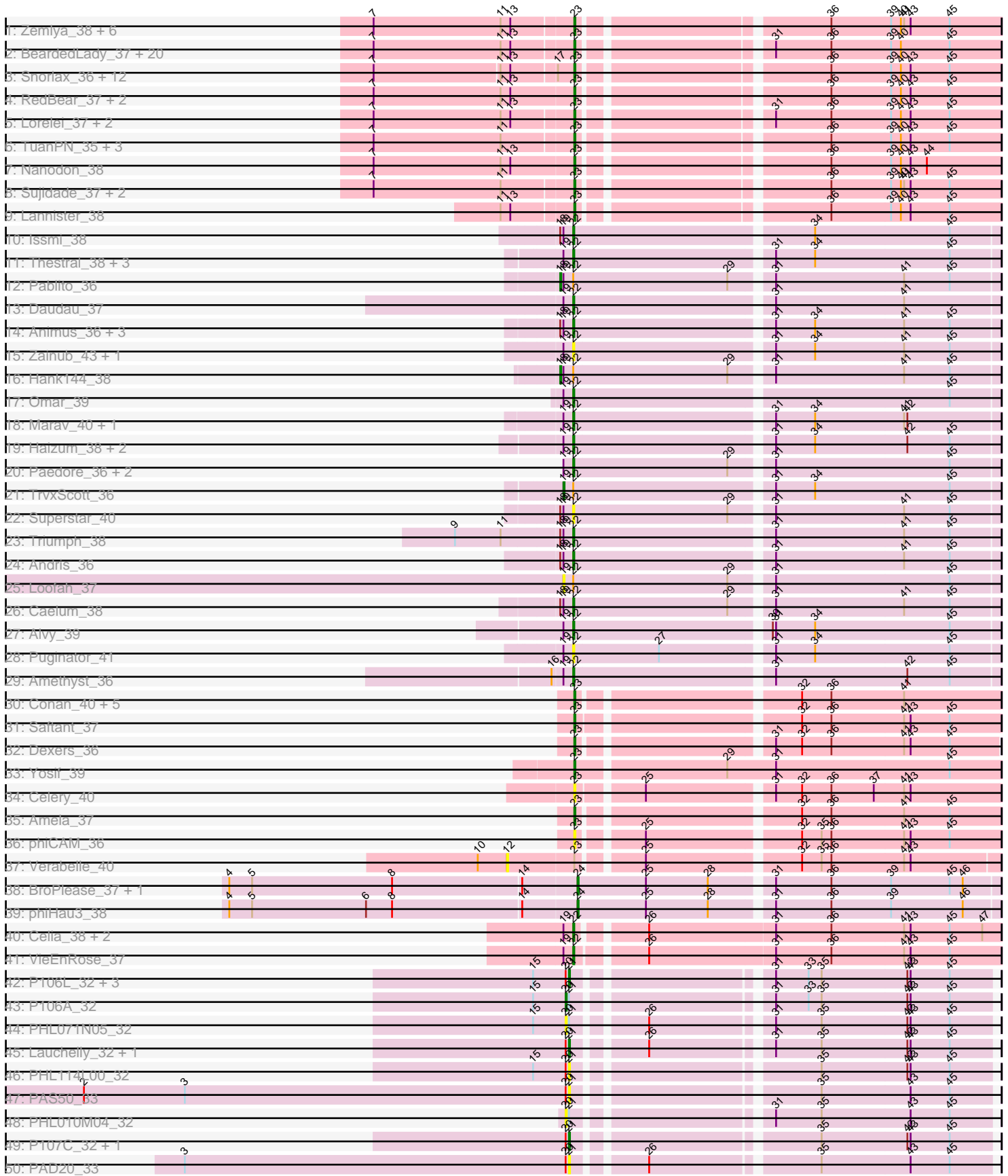
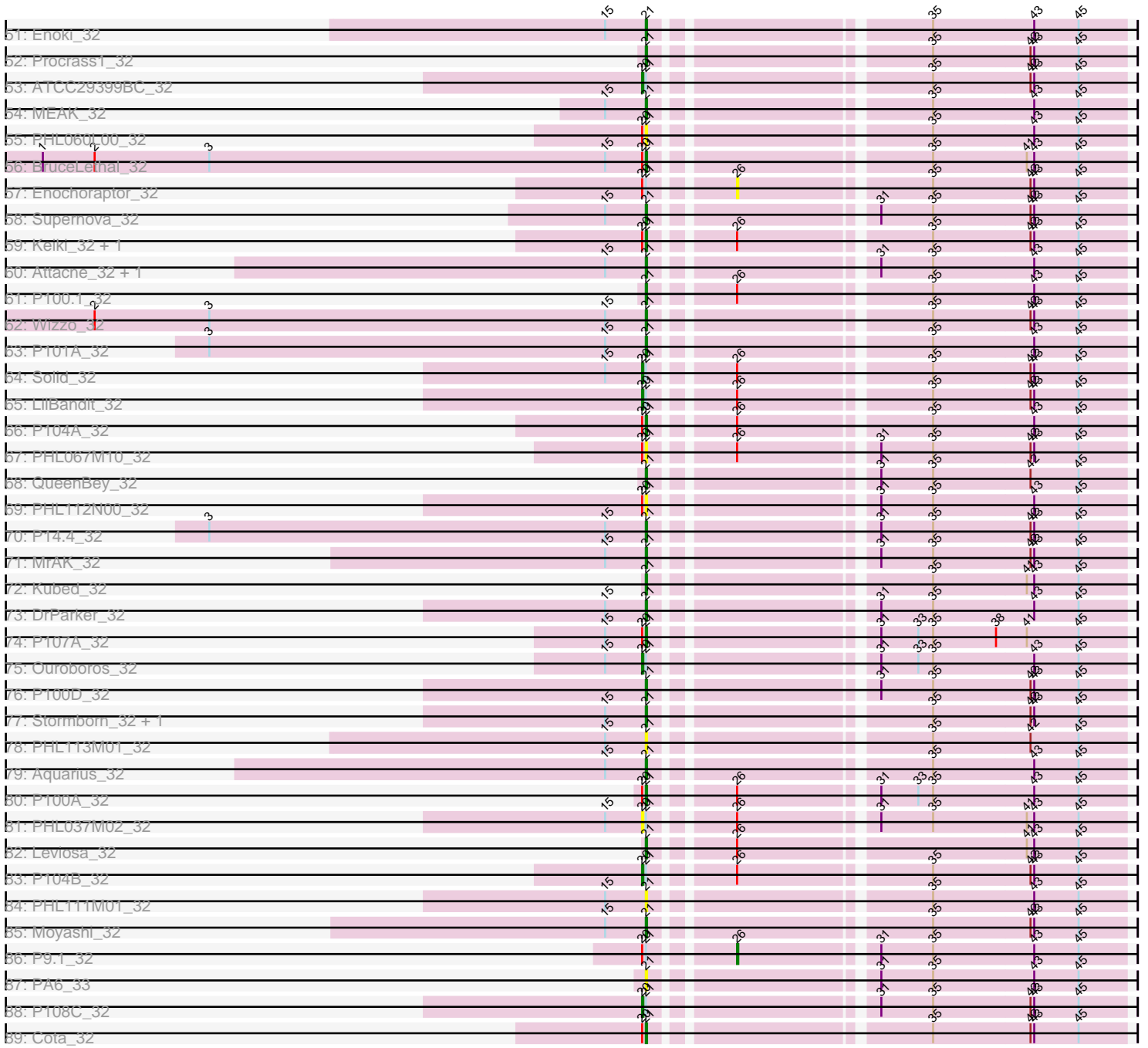


Pham 156165



Pham 156165



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 156165 Report

This analysis was run 04/12/24 on database version 558.

WARNING: Pham size does not match number of genes in report. Either unphamerated genes have been added (by you) or starterator has removed genes due to invalid start codon.

Pham number 156165 has 164 members, 29 are drafts.

Phages represented in each track:

- Track 1 : Zemlya\_38, Toma\_36, Danzina\_38, Celeste\_37, Brataylor\_39, Dattran\_38, Goby\_36
- Track 2 : BeardedLady\_37, Legacy\_36, Nerdos\_35, Eddasa\_37, Caliburn\_36, EnochSoames\_39, Rusticus\_37, Unstoppable\_36, SunsetPointe\_36, Leviticus\_36, Indigo\_35, Aaronocolus\_36, Bovely\_36, Esperer\_36, Hydra\_38, Phettuccine\_36, Izzy\_37, Jash\_37, BryanRecycles\_37, Ozzie\_36, Oliynyk\_37
- Track 3 : Snorlax\_36, Werner\_36, Chucky\_36, Hippo\_36, Dwayne\_36, BarryBee\_39, OzzyJ\_37, TagePhighter\_38, SarahRose\_36, Triste\_36, Whatever\_36, Emaanora\_39, Asten\_36
- Track 4 : RedBear\_37, South40\_36, Katalie\_36
- Track 5 : Lorelei\_37, Nabi\_37, Rana\_37
- Track 6 : TuanPN\_35, Maneekul\_36, Ejemplo\_35, Yasdnil\_36
- Track 7 : Nanodon\_38
- Track 8 : Sujidade\_37, Godpower\_37, Lika\_36
- Track 9 : Lannister\_38
- Track 10 : Issmi\_38
- Track 11 : Thestral\_38, Bowden\_37, BartholomewSD\_39, TinaBelcher\_37
- Track 12 : Pablito\_36
- Track 13 : Daudau\_37
- Track 14 : Animus\_36, SqueakyClean\_36, Janus\_37, GirlDinner\_38
- Track 15 : Zainub\_43, Paolo\_41
- Track 16 : Hank144\_38
- Track 17 : Omar\_39
- Track 18 : Marav\_40, Jevington\_40
- Track 19 : Haizum\_38, Tefunt\_38, Nishikigoi\_38
- Track 20 : Paedore\_36, R4\_37, ELB20\_35
- Track 21 : TrvxScott\_36
- Track 22 : Superstar\_40
- Track 23 : Triumph\_38
- Track 24 : Andris\_36
- Track 25 : Loofah\_37
- Track 26 : Caelum\_38
- Track 27 : Alvy\_39

- Track 28 : Puginator\_41
- Track 29 : Amethyst\_36
- Track 30 : Conan\_40, Alsaber\_38, ElGato\_39, Vanseggelen\_42, Provolone\_38, Verse\_37
- Track 31 : Saftant\_37
- Track 32 : Dexers\_36
- Track 33 : Yosif\_39
- Track 34 : Celery\_40
- Track 35 : Amela\_37
- Track 36 : phiCAM\_36
- Track 37 : Verabelle\_40
- Track 38 : BroPlease\_37, GreenWeasel\_38
- Track 39 : phiHau3\_38
- Track 40 : Celia\_38, Urza\_38, Itza\_38
- Track 41 : VieEnRose\_37
- Track 42 : P106L\_32, P106M\_32, P106C\_33, P106I\_32
- Track 43 : P106A\_32
- Track 44 : PHL071N05\_32
- Track 45 : Lauchelly\_32, Rileysaurus\_31
- Track 46 : PHL114L00\_32
- Track 47 : PAS50\_33
- Track 48 : PHL010M04\_32
- Track 49 : P107C\_32, ATCC29399BT\_32
- Track 50 : PAD20\_33
- Track 51 : Enoki\_32
- Track 52 : Procrass1\_32
- Track 53 : ATCC29399BC\_32
- Track 54 : MEAK\_32
- Track 55 : PHL060L00\_32
- Track 56 : BruceLethal\_32
- Track 57 : Enochoraptor\_32
- Track 58 : Supernova\_32
- Track 59 : Keiki\_32, Pirate\_32
- Track 60 : Attacne\_32, SKKY\_32
- Track 61 : P100.1\_32
- Track 62 : Wizzo\_32
- Track 63 : P101A\_32
- Track 64 : Solid\_32
- Track 65 : LilBandit\_32
- Track 66 : P104A\_32
- Track 67 : PHL067M10\_32
- Track 68 : QueenBey\_32
- Track 69 : PHL112N00\_32
- Track 70 : P14.4\_32
- Track 71 : MrAK\_32
- Track 72 : Kubed\_32
- Track 73 : DrParker\_32
- Track 74 : P107A\_32
- Track 75 : Ouroboros\_32
- Track 76 : P100D\_32
- Track 77 : Stormborn\_32, P105\_32
- Track 78 : PHL113M01\_32
- Track 79 : Aquarius\_32

- Track 80 : P100A\_32
- Track 81 : PHL037M02\_32
- Track 82 : Leviosa\_32
- Track 83 : P104B\_32
- Track 84 : PHL111M01\_32
- Track 85 : Moyashi\_32
- Track 86 : P9.1\_32
- Track 87 : PA6\_33
- Track 88 : P108C\_32
- Track 89 : Cota\_32

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

The start number called the most often in the published annotations is 23, it was called in 61 of the 135 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Aaronocolus\_36, Alsaber\_38, Amela\_37, Asten\_36, BarryBee\_39, BeardedLady\_37, Bovely\_36, Brataylor\_39, BryanRecycles\_37, Caliburn\_36, Celery\_40, Celeste\_37, Chucky\_36, Conan\_40, Danzina\_38, Dattran\_38, Dexers\_36, Dwayne\_36, Eddasa\_37, Ejemplo\_35, ElGato\_39, Emaanora\_39, EnochSoames\_39, Esperer\_36, Goby\_36, Godpower\_37, Hippo\_36, Hydra\_38, Indigo\_35, Izzy\_37, Jash\_37, Katalie\_36, Lannister\_38, Legacy\_36, Leviticus\_36, Lika\_36, Lorelei\_37, Maneekul\_36, Nabi\_37, Nanodon\_38, Nerdos\_35, Oliynyk\_37, Ozzie\_36, OzzyJ\_37, Phettuccine\_36, Provolone\_38, Rana\_37, RedBear\_37, Rusticus\_37, Saftant\_37, SarahRose\_36, Snorlax\_36, South40\_36, Sujidade\_37, SunsetPointe\_36, TagePhighter\_38, Toma\_36, Triste\_36, TuanPN\_35, Unstoppable\_36, Vanseggelen\_42, Verse\_37, Werner\_36, Whatever\_36, Yasdnil\_36, Yosif\_39, Zemlya\_38, phiCAM\_36,

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

- Verabelle\_40,

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

- ATCC29399BC\_32, ATCC29399BT\_32, Alvy\_39, Amethyst\_36, Andris\_36, Animus\_36, Aquarius\_32, Attacne\_32, BartholomewSD\_39, Bowden\_37, BroPlease\_37, BruceLethal\_32, Caelum\_38, Celia\_38, Cota\_32, Daudau\_37, DrParker\_32, ELB20\_35, Enochoraptor\_32, Enoki\_32, GirlDinner\_38, GreenWeasel\_38, Haizum\_38, Hank144\_38, Issmi\_38, Itza\_38, Janus\_37, Jevington\_40, Keiki\_32, Kubed\_32, Lauchelly\_32, Leviosa\_32, LilBandit\_32, Loofah\_37, MEAK\_32, Marav\_40, Moyashi\_32, MrAK\_32, Nishikigoi\_38, Omar\_39, Ouroboros\_32, P100.1\_32, P100A\_32, P100D\_32, P101A\_32, P104A\_32, P104B\_32, P105\_32, P106A\_32, P106C\_33, P106I\_32, P106L\_32, P106M\_32, P107A\_32, P107C\_32, P108C\_32, P14.4\_32, P9.1\_32, PA6\_33, PAD20\_33, PAS50\_33, PHL010M04\_32, PHL037M02\_32, PHL060L00\_32, PHL067M10\_32, PHL071N05\_32, PHL111M01\_32, PHL112N00\_32, PHL113M01\_32, PHL114L00\_32, Pablito\_36, Paedore\_36, Paolo\_41, Pirate\_32, Procrass1\_32, Puginator\_41, QueenBey\_32, R4\_37, Rileysaurus\_31, SKKY\_32, Solid\_32, SqueakyClean\_36, Stormborn\_32, Supernova\_32, Superstar\_40, Tefunt\_38, Thestral\_38, TinaBelcher\_37, Triumph\_38, TrvxScott\_36, Urza\_38, VieEnRose\_37,

Wizzo\_32, Zainub\_43, phiHau3\_38,

### Summary by start number:

#### Start 12:

- Found in 1 of 164 ( 0.6% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Verabelle\_40 (BD3),

#### Start 18:

- Found in 11 of 164 ( 6.7% ) of genes in pham
- Manual Annotations of this start: 2 of 135
- Called 18.2% of time when present
- Phage (with cluster) where this start called: Hank144\_38 (BD2), Pablito\_36 (BD2),

#### Start 19:

- Found in 36 of 164 ( 22.0% ) of genes in pham
- Manual Annotations of this start: 1 of 135
- Called 5.6% of time when present
- Phage (with cluster) where this start called: Loofah\_37 (BD2), TrvxScott\_36 (BD2),

#### Start 20:

- Found in 33 of 164 ( 20.1% ) of genes in pham
- Manual Annotations of this start: 7 of 135
- Called 30.3% of time when present
- Phage (with cluster) where this start called: ATCC29399BC\_32 (BU), LilBandit\_32 (BU), Ouroboros\_32 (BU), P104B\_32 (BU), P106A\_32 (BU), P108C\_32 (BU), PHL010M04\_32 (BU), PHL037M02\_32 (BU), PHL071N05\_32 (BU), Solid\_32 (BU),

#### Start 21:

- Found in 56 of 164 ( 34.1% ) of genes in pham
- Manual Annotations of this start: 34 of 135
- Called 78.6% of time when present
- Phage (with cluster) where this start called: ATCC29399BT\_32 (BU), Aquarius\_32 (BU), Attacne\_32 (BU), BruceLethal\_32 (BU), Cota\_32 (BU), DrParker\_32 (BU), Enoki\_32 (BU), Keiki\_32 (BU), Kubed\_32 (BU), Lauchelly\_32 (BU), Leviosa\_32 (BU), MEAK\_32 (BU), Moyashi\_32 (BU), MrAK\_32 (BU), P100.1\_32 (BU), P100A\_32 (BU), P100D\_32 (BU), P101A\_32 (BU), P104A\_32 (BU), P105\_32 (BU), P106C\_33 (BU), P106I\_32 (BU), P106L\_32 (BU), P106M\_32 (BU), P107A\_32 (BU), P107C\_32 (BU), P14.4\_32 (BU), PA6\_33 (BU), PAD20\_33 (BU), PAS50\_33 (BU), PHL060L00\_32 (BU), PHL067M10\_32 (BU), PHL111M01\_32 (BU), PHL112N00\_32 (BU), PHL113M01\_32 (BU), PHL114L00\_32 (BU), Pirate\_32 (BU), Procrass1\_32 (BU), QueenBey\_32 (BU), Rileysaurus\_31 (BU), SKKY\_32 (BU), Stormborn\_32 (BU), Supernova\_32 (BU), Wizzo\_32 (BU),

#### Start 22:

- Found in 36 of 164 ( 22.0% ) of genes in pham
- Manual Annotations of this start: 26 of 135
- Called 88.9% of time when present
- Phage (with cluster) where this start called: Alvy\_39 (BD2), Amethyst\_36 (BD2), Andris\_36 (BD2), Animus\_36 (BD2), BartholomewSD\_39 (BD2), Bowden\_37 (BD2), Caelum\_38 (BD2), Celia\_38 (BD6), Daudau\_37 (BD2), ELB20\_35 (BD2),

GirlDinner\_38 (BD2), Haizum\_38 (BD2), Issmi\_38 (BD2), Itza\_38 (BD6), Janus\_37 (BD2), Jevington\_40 (BD2), Marav\_40 (BD2), Nishikigoi\_38 (BD2), Omar\_39 (BD2), Paedore\_36 (BD2), Paolo\_41 (BD2), Puginator\_41 (BD2), R4\_37 (BD2), SqueakyClean\_36 (BD2), Superstar\_40 (BD2), Tefunt\_38 (BD2), Thestral\_38 (BD2), TinaBelcher\_37 (BD2), Triumph\_38 (BD2), Urza\_38 (BD6), VieEnRose\_37 (BD6), Zainub\_43 (BD2),

#### Start 23:

- Found in 69 of 164 ( 42.1% ) of genes in pham
- Manual Annotations of this start: 61 of 135
- Called 98.6% of time when present
- Phage (with cluster) where this start called: Aaronocolus\_36 (BD1), Alsaber\_38 (BD3), Amela\_37 (BD3), Asten\_36 (BD1), BarryBee\_39 (BD1), BeardedLady\_37 (BD1), Bovely\_36 (BD1), Brataylor\_39 (BD1), BryanRecycles\_37 (BD1), Caliburn\_36 (BD1), Celery\_40 (BD3), Celeste\_37 (BD1), Chucky\_36 (BD1), Conan\_40 (BD3), Danzina\_38 (BD1), Dattran\_38 (BD1), Dexers\_36 (BD3), Dwayne\_36 (BD1), Eddasa\_37 (BD1), Ejemplo\_35 (BD1), ElGato\_39 (BD3), Emaanora\_39 (BD1), EnochSoames\_39 (BD1), Esperer\_36 (BD1), Goby\_36 (BD1), Godpower\_37 (BD1), Hippo\_36 (BD1), Hydra\_38 (BD1), Indigo\_35 (BD1), Izzy\_37 (BD1), Jash\_37 (BD1), Katalie\_36 (BD1), Lannister\_38 (BD1), Legacy\_36 (BD1), Leviticus\_36 (BD1), Lika\_36 (BD1), Lorelei\_37 (BD1), Maneekul\_36 (BD1), Nabi\_37 (BD1), Nanodon\_38 (BD1), Nerdos\_35 (BD1), Oliynyk\_37 (BD1), Ozzie\_36 (BD1), OzzyJ\_37 (BD1), Phettuccine\_36 (BD1), Provolone\_38 (BD3), Rana\_37 (BD1), RedBear\_37 (BD1), Rusticus\_37 (BD1), Saftant\_37 (BD3), SarahRose\_36 (BD1), Snorlax\_36 (BD1), South40\_36 (BD1), Sujidade\_37 (BD1), SunsetPointe\_36 (BD1), TagePhighter\_38 (BD1), Toma\_36 (BD1), Triste\_36 (BD1), TuanPN\_35 (BD1), Unstoppable\_36 (BD1), Vanseggelen\_42 (BD3), Verse\_37 (BD3), Werner\_36 (BD1), Whatever\_36 (BD1), Yasdniil\_36 (BD1), Yosif\_39 (BD3), Zemlya\_38 (BD1), phiCAM\_36 (BD3),

#### Start 24:

- Found in 3 of 164 ( 1.8% ) of genes in pham
- Manual Annotations of this start: 3 of 135
- Called 100.0% of time when present
- Phage (with cluster) where this start called: BroPlease\_37 (BD4), GreenWeasel\_38 (BD4), phiHau3\_38 (BD4),

#### Start 26:

- Found in 21 of 164 ( 12.8% ) of genes in pham
- Manual Annotations of this start: 1 of 135
- Called 9.5% of time when present
- Phage (with cluster) where this start called: Enochoraptor\_32 (BU), P9.1\_32 (BU),

### Summary by clusters:

There are 6 clusters represented in this pham: BD4, BU, BD6, BD1, BD3, BD2,

#### Info for manual annotations of cluster BD1:

- Start number 23 was manually annotated 54 times for cluster BD1.

#### Info for manual annotations of cluster BD2:

- Start number 18 was manually annotated 2 times for cluster BD2.
- Start number 19 was manually annotated 1 time for cluster BD2.
- Start number 22 was manually annotated 22 times for cluster BD2.

Info for manual annotations of cluster BD3:

- Start number 23 was manually annotated 7 times for cluster BD3.

Info for manual annotations of cluster BD4:

- Start number 24 was manually annotated 3 times for cluster BD4.

Info for manual annotations of cluster BD6:

- Start number 22 was manually annotated 4 times for cluster BD6.

Info for manual annotations of cluster BU:

- Start number 20 was manually annotated 7 times for cluster BU.
- Start number 21 was manually annotated 34 times for cluster BU.
- Start number 26 was manually annotated 1 time for cluster BU.

**Gene Information:**

Gene: ATCC29399BC\_32 Start: 21881, Stop: 21522, Start Num: 20

Candidate Starts for ATCC29399BC\_32:

(Start: 20 @21881 has 7 MA's), (Start: 21 @21878 has 34 MA's), (35, 21677), (42, 21599), (43, 21596), (45, 21560),

Gene: ATCC29399BT\_32 Start: 21878, Stop: 21522, Start Num: 21

Candidate Starts for ATCC29399BT\_32:

(Start: 20 @21881 has 7 MA's), (Start: 21 @21878 has 34 MA's), (35, 21677), (42, 21599), (43, 21596), (45, 21560),

Gene: Aaronocolus\_36 Start: 27054, Stop: 27416, Start Num: 23

Candidate Starts for Aaronocolus\_36:

(7, 26874), (11, 26991), (13, 27000), (Start: 23 @27054 has 61 MA's), (31, 27210), (36, 27261), (39, 27315), (40, 27324), (45, 27369),

Gene: Alsaber\_38 Start: 28924, Stop: 29289, Start Num: 23

Candidate Starts for Alsaber\_38:

(Start: 23 @28924 has 61 MA's), (32, 29107), (36, 29134), (41, 29200),

Gene: Alvy\_39 Start: 28390, Stop: 28767, Start Num: 22

Candidate Starts for Alvy\_39:

(Start: 19 @28381 has 1 MA's), (Start: 22 @28390 has 26 MA's), (30, 28561), (31, 28564), (34, 28600), (45, 28723),

Gene: Amela\_37 Start: 29758, Stop: 30123, Start Num: 23

Candidate Starts for Amela\_37:

(Start: 23 @29758 has 61 MA's), (32, 29941), (36, 29968), (41, 30034), (45, 30076),

Gene: Amethyst\_36 Start: 27761, Stop: 28138, Start Num: 22

Candidate Starts for Amethyst\_36:

(16, 27743), (Start: 19 @27752 has 1 MA's), (Start: 22 @27761 has 26 MA's), (31, 27935), (42, 28055), (45, 28094),

Gene: Andris\_36 Start: 27819, Stop: 28196, Start Num: 22



Candidate Starts for Andris\_36:

(Start: 18 @27807 has 2 MA's), (Start: 19 @27810 has 1 MA's), (Start: 22 @27819 has 26 MA's), (31, 27993), (41, 28110), (45, 28152),

Gene: Animus\_36 Start: 28249, Stop: 28626, Start Num: 22

Candidate Starts for Animus\_36:

(Start: 18 @28237 has 2 MA's), (Start: 19 @28240 has 1 MA's), (Start: 22 @28249 has 26 MA's), (31, 28423), (34, 28459), (41, 28540), (45, 28582),

Gene: Aquarius\_32 Start: 21351, Stop: 20995, Start Num: 21

Candidate Starts for Aquarius\_32:

(15, 21384), (Start: 21 @21351 has 34 MA's), (35, 21150), (43, 21069), (45, 21033),

Gene: Asten\_36 Start: 27412, Stop: 27774, Start Num: 23

Candidate Starts for Asten\_36:

(7, 27235), (11, 27349), (13, 27358), (17, 27397), (Start: 23 @27412 has 61 MA's), (36, 27619), (39, 27673), (40, 27682), (43, 27691), (45, 27727),

Gene: Attacne\_32 Start: 21366, Stop: 21010, Start Num: 21

Candidate Starts for Attacne\_32:

(15, 21399), (Start: 21 @21366 has 34 MA's), (31, 21207), (35, 21165), (43, 21084), (45, 21048),

Gene: BarryBee\_39 Start: 27422, Stop: 27784, Start Num: 23

Candidate Starts for BarryBee\_39:

(7, 27245), (11, 27359), (13, 27368), (17, 27407), (Start: 23 @27422 has 61 MA's), (36, 27629), (39, 27683), (40, 27692), (43, 27701), (45, 27737),

Gene: BartholomewSD\_39 Start: 28389, Stop: 28766, Start Num: 22

Candidate Starts for BartholomewSD\_39:

(Start: 19 @28380 has 1 MA's), (Start: 22 @28389 has 26 MA's), (31, 28563), (34, 28599), (45, 28722),

Gene: BeardedLady\_37 Start: 27307, Stop: 27669, Start Num: 23

Candidate Starts for BeardedLady\_37:

(7, 27127), (11, 27244), (13, 27253), (Start: 23 @27307 has 61 MA's), (31, 27463), (36, 27514), (39, 27568), (40, 27577), (45, 27622),

Gene: Bovely\_36 Start: 27060, Stop: 27422, Start Num: 23

Candidate Starts for Bovely\_36:

(7, 26880), (11, 26997), (13, 27006), (Start: 23 @27060 has 61 MA's), (31, 27216), (36, 27267), (39, 27321), (40, 27330), (45, 27375),

Gene: Bowden\_37 Start: 28305, Stop: 28682, Start Num: 22

Candidate Starts for Bowden\_37:

(Start: 19 @28296 has 1 MA's), (Start: 22 @28305 has 26 MA's), (31, 28479), (34, 28515), (45, 28638),

Gene: Brataylor\_39 Start: 28396, Stop: 28758, Start Num: 23

Candidate Starts for Brataylor\_39:

(7, 28216), (11, 28333), (13, 28342), (Start: 23 @28396 has 61 MA's), (36, 28603), (39, 28657), (40, 28666), (41, 28669), (43, 28675), (45, 28711),

Gene: BroPlease\_37 Start: 27534, Stop: 27908, Start Num: 24

Candidate Starts for BroPlease\_37:

(4, 27219), (5, 27240), (8, 27369), (14, 27486), (Start: 24 @27534 has 3 MA's), (25, 27597), (28, 27654), (31, 27705), (36, 27756), (39, 27810), (45, 27864), (46, 27876),

Gene: BruceLethal\_32 Start: 21887, Stop: 21531, Start Num: 21

Candidate Starts for BruceLethal\_32:

(1, 22376), (2, 22334), (3, 22241), (15, 21920), (Start: 20 @21890 has 7 MA's), (Start: 21 @21887 has 34 MA's), (35, 21686), (41, 21611), (43, 21605), (45, 21569),

Gene: BryanRecycles\_37 Start: 27411, Stop: 27773, Start Num: 23

Candidate Starts for BryanRecycles\_37:

(7, 27231), (11, 27348), (13, 27357), (Start: 23 @27411 has 61 MA's), (31, 27567), (36, 27618), (39, 27672), (40, 27681), (45, 27726),

Gene: Caelum\_38 Start: 28011, Stop: 28388, Start Num: 22

Candidate Starts for Caelum\_38:

(Start: 18 @27999 has 2 MA's), (Start: 19 @28002 has 1 MA's), (Start: 22 @28011 has 26 MA's), (29, 28152), (31, 28185), (41, 28302), (45, 28344),

Gene: Caliburn\_36 Start: 27037, Stop: 27399, Start Num: 23

Candidate Starts for Caliburn\_36:

(7, 26857), (11, 26974), (13, 26983), (Start: 23 @27037 has 61 MA's), (31, 27193), (36, 27244), (39, 27298), (40, 27307), (45, 27352),

Gene: Celery\_40 Start: 28854, Stop: 29222, Start Num: 23

Candidate Starts for Celery\_40:

(Start: 23 @28854 has 61 MA's), (25, 28908), (31, 29016), (32, 29040), (36, 29067), (37, 29106), (41, 29133), (43, 29139),

Gene: Celeste\_37 Start: 27865, Stop: 28227, Start Num: 23

Candidate Starts for Celeste\_37:

(7, 27685), (11, 27802), (13, 27811), (Start: 23 @27865 has 61 MA's), (36, 28072), (39, 28126), (40, 28135), (41, 28138), (43, 28144), (45, 28180),

Gene: Celia\_38 Start: 27923, Stop: 28297, Start Num: 22

Candidate Starts for Celia\_38:

(Start: 19 @27914 has 1 MA's), (Start: 22 @27923 has 26 MA's), (Start: 26 @27977 has 1 MA's), (31, 28091), (36, 28142), (41, 28208), (43, 28214), (45, 28250), (47, 28280),

Gene: Chucky\_36 Start: 27426, Stop: 27788, Start Num: 23

Candidate Starts for Chucky\_36:

(7, 27249), (11, 27363), (13, 27372), (17, 27411), (Start: 23 @27426 has 61 MA's), (36, 27633), (39, 27687), (40, 27696), (43, 27705), (45, 27741),

Gene: Conan\_40 Start: 28818, Stop: 29183, Start Num: 23

Candidate Starts for Conan\_40:

(Start: 23 @28818 has 61 MA's), (32, 29001), (36, 29028), (41, 29094),

Gene: Cota\_32 Start: 21927, Stop: 21571, Start Num: 21

Candidate Starts for Cota\_32:

(Start: 20 @21930 has 7 MA's), (Start: 21 @21927 has 34 MA's), (35, 21726), (42, 21648), (43, 21645), (45, 21609),

Gene: Danzina\_38 Start: 28166, Stop: 28528, Start Num: 23

Candidate Starts for Danzina\_38:

(7, 27986), (11, 28103), (13, 28112), (Start: 23 @28166 has 61 MA's), (36, 28373), (39, 28427), (40, 28436), (41, 28439), (43, 28445), (45, 28481),

Gene: Dattran\_38 Start: 27972, Stop: 28334, Start Num: 23

Candidate Starts for Dattran\_38:

(7, 27792), (11, 27909), (13, 27918), (Start: 23 @27972 has 61 MA's), (36, 28179), (39, 28233), (40, 28242), (41, 28245), (43, 28251), (45, 28287),

Gene: Daudau\_37 Start: 28123, Stop: 28500, Start Num: 22

Candidate Starts for Daudau\_37:

(Start: 19 @28114 has 1 MA's), (Start: 22 @28123 has 26 MA's), (31, 28297), (41, 28414),

Gene: Dexers\_36 Start: 28846, Stop: 29208, Start Num: 23

Candidate Starts for Dexers\_36:

(Start: 23 @28846 has 61 MA's), (31, 29005), (32, 29029), (36, 29056), (41, 29122), (43, 29128), (45, 29164),

Gene: DrParker\_32 Start: 21981, Stop: 21625, Start Num: 21

Candidate Starts for DrParker\_32:

(15, 22014), (Start: 21 @21981 has 34 MA's), (31, 21822), (35, 21780), (43, 21699), (45, 21663),

Gene: Dwayne\_36 Start: 27413, Stop: 27775, Start Num: 23

Candidate Starts for Dwayne\_36:

(7, 27236), (11, 27350), (13, 27359), (17, 27398), (Start: 23 @27413 has 61 MA's), (36, 27620), (39, 27674), (40, 27683), (43, 27692), (45, 27728),

Gene: ELB20\_35 Start: 28408, Stop: 28785, Start Num: 22

Candidate Starts for ELB20\_35:

(Start: 19 @28399 has 1 MA's), (Start: 22 @28408 has 26 MA's), (29, 28549), (31, 28582), (45, 28741),

Gene: Eddasa\_37 Start: 27411, Stop: 27773, Start Num: 23

Candidate Starts for Eddasa\_37:

(7, 27231), (11, 27348), (13, 27357), (Start: 23 @27411 has 61 MA's), (31, 27567), (36, 27618), (39, 27672), (40, 27681), (45, 27726),

Gene: Ejemplo\_35 Start: 27357, Stop: 27719, Start Num: 23

Candidate Starts for Ejemplo\_35:

(7, 27177), (11, 27294), (Start: 23 @27357 has 61 MA's), (36, 27564), (39, 27618), (40, 27627), (43, 27636), (45, 27672),

Gene: ElGato\_39 Start: 28482, Stop: 28847, Start Num: 23

Candidate Starts for ElGato\_39:

(Start: 23 @28482 has 61 MA's), (32, 28665), (36, 28692), (41, 28758),

Gene: Emaanora\_39 Start: 27371, Stop: 27733, Start Num: 23

Candidate Starts for Emaanora\_39:

(7, 27194), (11, 27308), (13, 27317), (17, 27356), (Start: 23 @27371 has 61 MA's), (36, 27578), (39, 27632), (40, 27641), (43, 27650), (45, 27686),

Gene: EnochSoames\_39 Start: 27406, Stop: 27768, Start Num: 23

Candidate Starts for EnochSoames\_39:

(7, 27226), (11, 27343), (13, 27352), (Start: 23 @27406 has 61 MA's), (31, 27562), (36, 27613), (39, 27667), (40, 27676), (45, 27721),

Gene: Enochoraptor\_32 Start: 21843, Stop: 21544, Start Num: 26

Candidate Starts for Enochoraptor\_32:

(Start: 20 @21903 has 7 MA's), (Start: 21 @21900 has 34 MA's), (Start: 26 @21843 has 1 MA's), (35, 21699), (42, 21621), (43, 21618), (45, 21582),

Gene: Enoki\_32 Start: 21911, Stop: 21555, Start Num: 21

Candidate Starts for Enoki\_32:

(15, 21944), (Start: 21 @21911 has 34 MA's), (35, 21710), (43, 21629), (45, 21593),

Gene: Esperer\_36 Start: 26873, Stop: 27235, Start Num: 23

Candidate Starts for Esperer\_36:

(7, 26693), (11, 26810), (13, 26819), (Start: 23 @26873 has 61 MA's), (31, 27029), (36, 27080), (39, 27134), (40, 27143), (45, 27188),

Gene: GirlDinner\_38 Start: 27750, Stop: 28127, Start Num: 22

Candidate Starts for GirlDinner\_38:

(Start: 18 @27738 has 2 MA's), (Start: 19 @27741 has 1 MA's), (Start: 22 @27750 has 26 MA's), (31, 27924), (34, 27960), (41, 28041), (45, 28083),

Gene: Goby\_36 Start: 27871, Stop: 28233, Start Num: 23

Candidate Starts for Goby\_36:

(7, 27691), (11, 27808), (13, 27817), (Start: 23 @27871 has 61 MA's), (36, 28078), (39, 28132), (40, 28141), (41, 28144), (43, 28150), (45, 28186),

Gene: Godpower\_37 Start: 27866, Stop: 28228, Start Num: 23

Candidate Starts for Godpower\_37:

(7, 27686), (11, 27803), (Start: 23 @27866 has 61 MA's), (36, 28073), (39, 28127), (40, 28136), (41, 28139), (43, 28145), (45, 28181),

Gene: GreenWeasel\_38 Start: 27541, Stop: 27915, Start Num: 24

Candidate Starts for GreenWeasel\_38:

(4, 27226), (5, 27247), (8, 27376), (14, 27493), (Start: 24 @27541 has 3 MA's), (25, 27604), (28, 27661), (31, 27712), (36, 27763), (39, 27817), (45, 27871), (46, 27883),

Gene: Haizum\_38 Start: 28102, Stop: 28479, Start Num: 22

Candidate Starts for Haizum\_38:

(Start: 19 @28093 has 1 MA's), (Start: 22 @28102 has 26 MA's), (31, 28276), (34, 28312), (42, 28396), (45, 28435),

Gene: Hank144\_38 Start: 28134, Stop: 28523, Start Num: 18

Candidate Starts for Hank144\_38:

(Start: 18 @28134 has 2 MA's), (Start: 19 @28137 has 1 MA's), (Start: 22 @28146 has 26 MA's), (29, 28287), (31, 28320), (41, 28437), (45, 28479),

Gene: Hippo\_36 Start: 27422, Stop: 27784, Start Num: 23

Candidate Starts for Hippo\_36:

(7, 27245), (11, 27359), (13, 27368), (17, 27407), (Start: 23 @27422 has 61 MA's), (36, 27629), (39, 27683), (40, 27692), (43, 27701), (45, 27737),

Gene: Hydra\_38 Start: 27585, Stop: 27947, Start Num: 23

Candidate Starts for Hydra\_38:

(7, 27405), (11, 27522), (13, 27531), (Start: 23 @27585 has 61 MA's), (31, 27741), (36, 27792), (39, 27846), (40, 27855), (45, 27900),

Gene: Indigo\_35 Start: 27053, Stop: 27415, Start Num: 23

Candidate Starts for Indigo\_35:

(7, 26873), (11, 26990), (13, 26999), (Start: 23 @27053 has 61 MA's), (31, 27209), (36, 27260), (39, 27314), (40, 27323), (45, 27368),

Gene: Issmi\_38 Start: 28702, Stop: 29079, Start Num: 22

Candidate Starts for Issmi\_38:

(Start: 18 @28690 has 2 MA's), (Start: 19 @28693 has 1 MA's), (Start: 22 @28702 has 26 MA's), (34, 28912), (45, 29035),

Gene: Itza\_38 Start: 27837, Stop: 28211, Start Num: 22

Candidate Starts for Itza\_38:

(Start: 19 @27828 has 1 MA's), (Start: 22 @27837 has 26 MA's), (Start: 26 @27891 has 1 MA's), (31, 28005), (36, 28056), (41, 28122), (43, 28128), (45, 28164), (47, 28194),

Gene: Izzy\_37 Start: 27458, Stop: 27820, Start Num: 23

Candidate Starts for Izzy\_37:

(7, 27278), (11, 27395), (13, 27404), (Start: 23 @27458 has 61 MA's), (31, 27614), (36, 27665), (39, 27719), (40, 27728), (45, 27773),

Gene: Janus\_37 Start: 28090, Stop: 28467, Start Num: 22

Candidate Starts for Janus\_37:

(Start: 18 @28078 has 2 MA's), (Start: 19 @28081 has 1 MA's), (Start: 22 @28090 has 26 MA's), (31, 28264), (34, 28300), (41, 28381), (45, 28423),

Gene: Jash\_37 Start: 27411, Stop: 27773, Start Num: 23

Candidate Starts for Jash\_37:

(7, 27231), (11, 27348), (13, 27357), (Start: 23 @27411 has 61 MA's), (31, 27567), (36, 27618), (39, 27672), (40, 27681), (45, 27726),

Gene: Jevington\_40 Start: 28493, Stop: 28870, Start Num: 22

Candidate Starts for Jevington\_40:

(Start: 19 @28484 has 1 MA's), (Start: 22 @28493 has 26 MA's), (31, 28667), (34, 28703), (41, 28784), (42, 28787),

Gene: Katalie\_36 Start: 27596, Stop: 27958, Start Num: 23

Candidate Starts for Katalie\_36:

(7, 27413), (11, 27530), (13, 27539), (Start: 23 @27596 has 61 MA's), (36, 27803), (39, 27857), (40, 27866), (43, 27875), (45, 27911),

Gene: Keiki\_32 Start: 21826, Stop: 21470, Start Num: 21

Candidate Starts for Keiki\_32:

(Start: 20 @21829 has 7 MA's), (Start: 21 @21826 has 34 MA's), (Start: 26 @21769 has 1 MA's), (35, 21625), (42, 21547), (43, 21544), (45, 21508),

Gene: Kubed\_32 Start: 21882, Stop: 21526, Start Num: 21

Candidate Starts for Kubed\_32:

(Start: 21 @21882 has 34 MA's), (35, 21681), (41, 21606), (43, 21600), (45, 21564),

Gene: Lannister\_38 Start: 28076, Stop: 28438, Start Num: 23

Candidate Starts for Lannister\_38:

(11, 28013), (13, 28022), (Start: 23 @28076 has 61 MA's), (36, 28283), (39, 28337), (40, 28346), (43, 28355), (45, 28391),

Gene: Lauchelly\_32 Start: 21931, Stop: 21575, Start Num: 21

Candidate Starts for Lauchelly\_32:

(Start: 20 @21934 has 7 MA's), (Start: 21 @21931 has 34 MA's), (Start: 26 @21874 has 1 MA's), (31, 21772), (35, 21730), (42, 21652), (43, 21649), (45, 21613),

Gene: Legacy\_36 Start: 27028, Stop: 27390, Start Num: 23

Candidate Starts for Legacy\_36:

(7, 26848), (11, 26965), (13, 26974), (Start: 23 @27028 has 61 MA's), (31, 27184), (36, 27235), (39, 27289), (40, 27298), (45, 27343),

Gene: Leviosa\_32 Start: 21927, Stop: 21571, Start Num: 21

Candidate Starts for Leviosa\_32:

(Start: 21 @21927 has 34 MA's), (Start: 26 @21870 has 1 MA's), (41, 21651), (43, 21645), (45, 21609),

Gene: Leviticus\_36 Start: 27057, Stop: 27419, Start Num: 23

Candidate Starts for Leviticus\_36:

(7, 26877), (11, 26994), (13, 27003), (Start: 23 @27057 has 61 MA's), (31, 27213), (36, 27264), (39, 27318), (40, 27327), (45, 27372),

Gene: Lika\_36 Start: 27869, Stop: 28231, Start Num: 23

Candidate Starts for Lika\_36:

(7, 27689), (11, 27806), (Start: 23 @27869 has 61 MA's), (36, 28076), (39, 28130), (40, 28139), (41, 28142), (43, 28148), (45, 28184),

Gene: LilBandit\_32 Start: 21724, Stop: 21365, Start Num: 20

Candidate Starts for LilBandit\_32:

(Start: 20 @21724 has 7 MA's), (Start: 21 @21721 has 34 MA's), (Start: 26 @21664 has 1 MA's), (35, 21520), (42, 21442), (43, 21439), (45, 21403),

Gene: Loofah\_37 Start: 28269, Stop: 28655, Start Num: 19

Candidate Starts for Loofah\_37:

(Start: 19 @28269 has 1 MA's), (Start: 22 @28278 has 26 MA's), (29, 28419), (31, 28452), (45, 28611),

Gene: Lorelei\_37 Start: 27928, Stop: 28290, Start Num: 23

Candidate Starts for Lorelei\_37:

(7, 27748), (11, 27865), (13, 27874), (Start: 23 @27928 has 61 MA's), (31, 28084), (36, 28135), (39, 28189), (40, 28198), (43, 28207), (45, 28243),

Gene: MEAK\_32 Start: 21588, Stop: 21232, Start Num: 21

Candidate Starts for MEAK\_32:

(15, 21621), (Start: 21 @21588 has 34 MA's), (35, 21387), (43, 21306), (45, 21270),

Gene: Maneekul\_36 Start: 27447, Stop: 27809, Start Num: 23

Candidate Starts for Maneekul\_36:

(7, 27267), (11, 27384), (Start: 23 @27447 has 61 MA's), (36, 27654), (39, 27708), (40, 27717), (43, 27726), (45, 27762),

Gene: Marav\_40 Start: 28818, Stop: 29195, Start Num: 22

Candidate Starts for Marav\_40:

(Start: 19 @28809 has 1 MA's), (Start: 22 @28818 has 26 MA's), (31, 28992), (34, 29028), (41, 29109), (42, 29112),

Gene: Moyashi\_32 Start: 21693, Stop: 21337, Start Num: 21

Candidate Starts for Moyashi\_32:

(15, 21726), (Start: 21 @21693 has 34 MA's), (35, 21492), (42, 21414), (43, 21411), (45, 21375),

Gene: MrAK\_32 Start: 21698, Stop: 21342, Start Num: 21

Candidate Starts for MrAK\_32:

(15, 21731), (Start: 21 @21698 has 34 MA's), (31, 21539), (35, 21497), (42, 21419), (43, 21416), (45, 21380),

Gene: Nabi\_37 Start: 27928, Stop: 28290, Start Num: 23

Candidate Starts for Nabi\_37:

(7, 27748), (11, 27865), (13, 27874), (Start: 23 @27928 has 61 MA's), (31, 28084), (36, 28135), (39, 28189), (40, 28198), (43, 28207), (45, 28243),

Gene: Nanodon\_38 Start: 27697, Stop: 28059, Start Num: 23

Candidate Starts for Nanodon\_38:

(7, 27514), (11, 27631), (13, 27640), (Start: 23 @27697 has 61 MA's), (36, 27904), (39, 27958), (40, 27967), (43, 27976), (44, 27991),

Gene: Nerdos\_35 Start: 27052, Stop: 27414, Start Num: 23

Candidate Starts for Nerdos\_35:

(7, 26872), (11, 26989), (13, 26998), (Start: 23 @27052 has 61 MA's), (31, 27208), (36, 27259), (39, 27313), (40, 27322), (45, 27367),

Gene: Nishikigoi\_38 Start: 28102, Stop: 28479, Start Num: 22

Candidate Starts for Nishikigoi\_38:

(Start: 19 @28093 has 1 MA's), (Start: 22 @28102 has 26 MA's), (31, 28276), (34, 28312), (42, 28396), (45, 28435),

Gene: Oliynyk\_37 Start: 27411, Stop: 27773, Start Num: 23

Candidate Starts for Oliynyk\_37:

(7, 27231), (11, 27348), (13, 27357), (Start: 23 @27411 has 61 MA's), (31, 27567), (36, 27618), (39, 27672), (40, 27681), (45, 27726),

Gene: Omar\_39 Start: 28330, Stop: 28707, Start Num: 22

Candidate Starts for Omar\_39:

(Start: 19 @28321 has 1 MA's), (Start: 22 @28330 has 26 MA's), (45, 28663),

Gene: Ouroboros\_32 Start: 21911, Stop: 21552, Start Num: 20

Candidate Starts for Ouroboros\_32:

(15, 21941), (Start: 20 @21911 has 7 MA's), (Start: 21 @21908 has 34 MA's), (31, 21749), (33, 21719), (35, 21707), (43, 21626), (45, 21590),

Gene: Ozzie\_36 Start: 27037, Stop: 27399, Start Num: 23

Candidate Starts for Ozzie\_36:

(7, 26857), (11, 26974), (13, 26983), (Start: 23 @27037 has 61 MA's), (31, 27193), (36, 27244), (39, 27298), (40, 27307), (45, 27352),

Gene: OzzyJ\_37 Start: 27413, Stop: 27775, Start Num: 23

Candidate Starts for OzzyJ\_37:

(7, 27236), (11, 27350), (13, 27359), (17, 27398), (Start: 23 @27413 has 61 MA's), (36, 27620), (39, 27674), (40, 27683), (43, 27692), (45, 27728),

Gene: P100.1\_32 Start: 21963, Stop: 21607, Start Num: 21

Candidate Starts for P100.1\_32:

(Start: 21 @21963 has 34 MA's), (Start: 26 @21906 has 1 MA's), (35, 21762), (43, 21681), (45, 21645),

Gene: P100A\_32 Start: 21913, Stop: 21557, Start Num: 21

Candidate Starts for P100A\_32:

(Start: 20 @21916 has 7 MA's), (Start: 21 @21913 has 34 MA's), (Start: 26 @21856 has 1 MA's), (31, 21754), (33, 21724), (35, 21712), (43, 21631), (45, 21595),

Gene: P100D\_32 Start: 21906, Stop: 21550, Start Num: 21

Candidate Starts for P100D\_32:

(Start: 21 @21906 has 34 MA's), (31, 21747), (35, 21705), (42, 21627), (43, 21624), (45, 21588),

Gene: P101A\_32 Start: 21932, Stop: 21576, Start Num: 21

Candidate Starts for P101A\_32:

(3, 22286), (15, 21965), (Start: 21 @21932 has 34 MA's), (35, 21731), (43, 21650), (45, 21614),

Gene: P104A\_32 Start: 21701, Stop: 21345, Start Num: 21

Candidate Starts for P104A\_32:

(Start: 20 @21704 has 7 MA's), (Start: 21 @21701 has 34 MA's), (Start: 26 @21644 has 1 MA's), (35, 21500), (43, 21419), (45, 21383),

Gene: P104B\_32 Start: 21899, Stop: 21540, Start Num: 20

Candidate Starts for P104B\_32:

(Start: 20 @21899 has 7 MA's), (Start: 21 @21896 has 34 MA's), (Start: 26 @21839 has 1 MA's), (35, 21695), (42, 21617), (43, 21614), (45, 21578),

Gene: P105\_32 Start: 21561, Stop: 21205, Start Num: 21

Candidate Starts for P105\_32:

(15, 21594), (Start: 21 @21561 has 34 MA's), (35, 21360), (42, 21282), (43, 21279), (45, 21243),

Gene: P106A\_32 Start: 21990, Stop: 21631, Start Num: 20

Candidate Starts for P106A\_32:

(15, 22020), (Start: 20 @21990 has 7 MA's), (Start: 21 @21987 has 34 MA's), (31, 21828), (33, 21798), (35, 21786), (42, 21708), (43, 21705), (45, 21669),

Gene: P106C\_33 Start: 21925, Stop: 21569, Start Num: 21

Candidate Starts for P106C\_33:

(15, 21958), (Start: 20 @21928 has 7 MA's), (Start: 21 @21925 has 34 MA's), (31, 21766), (33, 21736), (35, 21724), (42, 21646), (43, 21643), (45, 21607),

Gene: P106I\_32 Start: 21754, Stop: 21398, Start Num: 21

Candidate Starts for P106I\_32:



(15, 21787), (Start: 20 @21757 has 7 MA's), (Start: 21 @21754 has 34 MA's), (31, 21595), (33, 21565), (35, 21553), (42, 21475), (43, 21472), (45, 21436),

Gene: P106L\_32 Start: 21925, Stop: 21569, Start Num: 21

Candidate Starts for P106L\_32:

(15, 21958), (Start: 20 @21928 has 7 MA's), (Start: 21 @21925 has 34 MA's), (31, 21766), (33, 21736), (35, 21724), (42, 21646), (43, 21643), (45, 21607),

Gene: P106M\_32 Start: 21925, Stop: 21569, Start Num: 21

Candidate Starts for P106M\_32:

(15, 21958), (Start: 20 @21928 has 7 MA's), (Start: 21 @21925 has 34 MA's), (31, 21766), (33, 21736), (35, 21724), (42, 21646), (43, 21643), (45, 21607),

Gene: P107A\_32 Start: 21941, Stop: 21585, Start Num: 21

Candidate Starts for P107A\_32:

(15, 21974), (Start: 20 @21944 has 7 MA's), (Start: 21 @21941 has 34 MA's), (31, 21782), (33, 21752), (35, 21740), (38, 21689), (41, 21665), (45, 21623),

Gene: P107C\_32 Start: 21878, Stop: 21522, Start Num: 21

Candidate Starts for P107C\_32:

(Start: 20 @21881 has 7 MA's), (Start: 21 @21878 has 34 MA's), (35, 21677), (42, 21599), (43, 21596), (45, 21560),

Gene: P108C\_32 Start: 21895, Stop: 21536, Start Num: 20

Candidate Starts for P108C\_32:

(Start: 20 @21895 has 7 MA's), (Start: 21 @21892 has 34 MA's), (31, 21733), (35, 21691), (42, 21613), (43, 21610), (45, 21574),

Gene: P14.4\_32 Start: 21894, Stop: 21538, Start Num: 21

Candidate Starts for P14.4\_32:

(3, 22248), (15, 21927), (Start: 21 @21894 has 34 MA's), (31, 21735), (35, 21693), (42, 21615), (43, 21612), (45, 21576),

Gene: P9.1\_32 Start: 21865, Stop: 21566, Start Num: 26

Candidate Starts for P9.1\_32:

(Start: 20 @21925 has 7 MA's), (Start: 21 @21922 has 34 MA's), (Start: 26 @21865 has 1 MA's), (31, 21763), (35, 21721), (43, 21640), (45, 21604),

Gene: PA6\_33 Start: 21886, Stop: 21530, Start Num: 21

Candidate Starts for PA6\_33:

(Start: 21 @21886 has 34 MA's), (31, 21727), (35, 21685), (43, 21604), (45, 21568),

Gene: PAD20\_33 Start: 21666, Stop: 21310, Start Num: 21

Candidate Starts for PAD20\_33:

(3, 22020), (Start: 20 @21669 has 7 MA's), (Start: 21 @21666 has 34 MA's), (Start: 26 @21609 has 1 MA's), (35, 21465), (43, 21384), (45, 21348),

Gene: PAS50\_33 Start: 21831, Stop: 21475, Start Num: 21

Candidate Starts for PAS50\_33:

(2, 22278), (3, 22185), (Start: 20 @21834 has 7 MA's), (Start: 21 @21831 has 34 MA's), (35, 21630), (43, 21549), (45, 21513),

Gene: PHL010M04\_32 Start: 21909, Stop: 21550, Start Num: 20

Candidate Starts for PHL010M04\_32:

(Start: 20 @21909 has 7 MA's), (Start: 21 @21906 has 34 MA's), (31, 21747), (35, 21705), (43, 21624), (45, 21588),

Gene: PHL037M02\_32 Start: 21893, Stop: 21534, Start Num: 20

Candidate Starts for PHL037M02\_32:

(15, 21923), (Start: 20 @21893 has 7 MA's), (Start: 21 @21890 has 34 MA's), (Start: 26 @21833 has 1 MA's), (31, 21731), (35, 21689), (41, 21614), (43, 21608), (45, 21572),

Gene: PHL060L00\_32 Start: 21736, Stop: 21380, Start Num: 21

Candidate Starts for PHL060L00\_32:

(Start: 20 @21739 has 7 MA's), (Start: 21 @21736 has 34 MA's), (35, 21535), (43, 21454), (45, 21418),

Gene: PHL067M10\_32 Start: 21856, Stop: 21500, Start Num: 21

Candidate Starts for PHL067M10\_32:

(Start: 20 @21859 has 7 MA's), (Start: 21 @21856 has 34 MA's), (Start: 26 @21799 has 1 MA's), (31, 21697), (35, 21655), (42, 21577), (43, 21574), (45, 21538),

Gene: PHL071N05\_32 Start: 21918, Stop: 21559, Start Num: 20

Candidate Starts for PHL071N05\_32:

(15, 21948), (Start: 20 @21918 has 7 MA's), (Start: 21 @21915 has 34 MA's), (Start: 26 @21858 has 1 MA's), (31, 21756), (35, 21714), (42, 21636), (43, 21633), (45, 21597),

Gene: PHL111M01\_32 Start: 21613, Stop: 21257, Start Num: 21

Candidate Starts for PHL111M01\_32:

(15, 21646), (Start: 21 @21613 has 34 MA's), (35, 21412), (43, 21331), (45, 21295),

Gene: PHL112N00\_32 Start: 21923, Stop: 21567, Start Num: 21

Candidate Starts for PHL112N00\_32:

(Start: 20 @21926 has 7 MA's), (Start: 21 @21923 has 34 MA's), (31, 21764), (35, 21722), (43, 21641), (45, 21605),

Gene: PHL113M01\_32 Start: 21662, Stop: 21306, Start Num: 21

Candidate Starts for PHL113M01\_32:

(15, 21695), (Start: 21 @21662 has 34 MA's), (35, 21461), (42, 21383), (45, 21344),

Gene: PHL114L00\_32 Start: 21878, Stop: 21522, Start Num: 21

Candidate Starts for PHL114L00\_32:

(15, 21911), (Start: 20 @21881 has 7 MA's), (Start: 21 @21878 has 34 MA's), (35, 21677), (42, 21599), (43, 21596), (45, 21560),

Gene: Pablito\_36 Start: 27641, Stop: 28030, Start Num: 18

Candidate Starts for Pablito\_36:

(Start: 18 @27641 has 2 MA's), (Start: 19 @27644 has 1 MA's), (Start: 22 @27653 has 26 MA's), (29, 27794), (31, 27827), (41, 27944), (45, 27986),

Gene: Paedore\_36 Start: 28263, Stop: 28640, Start Num: 22

Candidate Starts for Paedore\_36:

(Start: 19 @28254 has 1 MA's), (Start: 22 @28263 has 26 MA's), (29, 28404), (31, 28437), (45, 28596),

Gene: Paolo\_41 Start: 28672, Stop: 29049, Start Num: 22

Candidate Starts for Paolo\_41:

(Start: 19 @28663 has 1 MA's), (Start: 22 @28672 has 26 MA's), (31, 28846), (34, 28882), (41, 28963), (45, 29005),

Gene: Phettuccine\_36 Start: 27053, Stop: 27415, Start Num: 23

Candidate Starts for Phettuccine\_36:

(7, 26873), (11, 26990), (13, 26999), (Start: 23 @27053 has 61 MA's), (31, 27209), (36, 27260), (39, 27314), (40, 27323), (45, 27368),

Gene: Pirate\_32 Start: 21811, Stop: 21455, Start Num: 21

Candidate Starts for Pirate\_32:

(Start: 20 @21814 has 7 MA's), (Start: 21 @21811 has 34 MA's), (Start: 26 @21754 has 1 MA's), (35, 21610), (42, 21532), (43, 21529), (45, 21493),

Gene: Procrass1\_32 Start: 21885, Stop: 21529, Start Num: 21

Candidate Starts for Procrass1\_32:

(Start: 21 @21885 has 34 MA's), (35, 21684), (42, 21606), (43, 21603), (45, 21567),

Gene: Provolone\_38 Start: 28473, Stop: 28838, Start Num: 23

Candidate Starts for Provolone\_38:

(Start: 23 @28473 has 61 MA's), (32, 28656), (36, 28683), (41, 28749),

Gene: Puginator\_41 Start: 28693, Stop: 29070, Start Num: 22

Candidate Starts for Puginator\_41:

(Start: 19 @28684 has 1 MA's), (Start: 22 @28693 has 26 MA's), (27, 28771), (31, 28867), (34, 28903), (45, 29026),

Gene: QueenBey\_32 Start: 21868, Stop: 21512, Start Num: 21

Candidate Starts for QueenBey\_32:

(Start: 21 @21868 has 34 MA's), (31, 21709), (35, 21667), (42, 21589), (45, 21550),

Gene: R4\_37 Start: 28418, Stop: 28795, Start Num: 22

Candidate Starts for R4\_37:

(Start: 19 @28409 has 1 MA's), (Start: 22 @28418 has 26 MA's), (29, 28559), (31, 28592), (45, 28751),

Gene: Rana\_37 Start: 27928, Stop: 28290, Start Num: 23

Candidate Starts for Rana\_37:

(7, 27748), (11, 27865), (13, 27874), (Start: 23 @27928 has 61 MA's), (31, 28084), (36, 28135), (39, 28189), (40, 28198), (43, 28207), (45, 28243),

Gene: RedBear\_37 Start: 27596, Stop: 27958, Start Num: 23

Candidate Starts for RedBear\_37:

(7, 27413), (11, 27530), (13, 27539), (Start: 23 @27596 has 61 MA's), (36, 27803), (39, 27857), (40, 27866), (43, 27875), (45, 27911),

Gene: Rileysaurus\_31 Start: 21916, Stop: 21560, Start Num: 21

Candidate Starts for Rileysaurus\_31:

(Start: 20 @21919 has 7 MA's), (Start: 21 @21916 has 34 MA's), (Start: 26 @21859 has 1 MA's), (31, 21757), (35, 21715), (42, 21637), (43, 21634), (45, 21598),

Gene: Rusticus\_37 Start: 27411, Stop: 27773, Start Num: 23

Candidate Starts for Rusticus\_37:

(7, 27231), (11, 27348), (13, 27357), (Start: 23 @27411 has 61 MA's), (31, 27567), (36, 27618), (39, 27672), (40, 27681), (45, 27726),

Gene: SKKY\_32 Start: 21667, Stop: 21311, Start Num: 21

Candidate Starts for SKKY\_32:

(15, 21700), (Start: 21 @21667 has 34 MA's), (31, 21508), (35, 21466), (43, 21385), (45, 21349),

Gene: Saftant\_37 Start: 29043, Stop: 29411, Start Num: 23

Candidate Starts for Saftant\_37:

(Start: 23 @29043 has 61 MA's), (32, 29229), (36, 29256), (41, 29322), (43, 29328), (45, 29364),

Gene: SarahRose\_36 Start: 27421, Stop: 27783, Start Num: 23

Candidate Starts for SarahRose\_36:

(7, 27244), (11, 27358), (13, 27367), (17, 27406), (Start: 23 @27421 has 61 MA's), (36, 27628), (39, 27682), (40, 27691), (43, 27700), (45, 27736),

Gene: Snorlax\_36 Start: 27425, Stop: 27787, Start Num: 23

Candidate Starts for Snorlax\_36:

(7, 27248), (11, 27362), (13, 27371), (17, 27410), (Start: 23 @27425 has 61 MA's), (36, 27632), (39, 27686), (40, 27695), (43, 27704), (45, 27740),

Gene: Solid\_32 Start: 21901, Stop: 21542, Start Num: 20

Candidate Starts for Solid\_32:

(15, 21931), (Start: 20 @21901 has 7 MA's), (Start: 21 @21898 has 34 MA's), (Start: 26 @21841 has 1 MA's), (35, 21697), (42, 21619), (43, 21616), (45, 21580),

Gene: South40\_36 Start: 27596, Stop: 27958, Start Num: 23

Candidate Starts for South40\_36:

(7, 27413), (11, 27530), (13, 27539), (Start: 23 @27596 has 61 MA's), (36, 27803), (39, 27857), (40, 27866), (43, 27875), (45, 27911),

Gene: SqueakyClean\_36 Start: 28181, Stop: 28558, Start Num: 22

Candidate Starts for SqueakyClean\_36:

(Start: 18 @28169 has 2 MA's), (Start: 19 @28172 has 1 MA's), (Start: 22 @28181 has 26 MA's), (31, 28355), (34, 28391), (41, 28472), (45, 28514),

Gene: Stormborn\_32 Start: 21505, Stop: 21149, Start Num: 21

Candidate Starts for Stormborn\_32:

(15, 21538), (Start: 21 @21505 has 34 MA's), (35, 21304), (42, 21226), (43, 21223), (45, 21187),

Gene: Sujidade\_37 Start: 28154, Stop: 28516, Start Num: 23

Candidate Starts for Sujidade\_37:

(7, 27974), (11, 28091), (Start: 23 @28154 has 61 MA's), (36, 28361), (39, 28415), (40, 28424), (41, 28427), (43, 28433), (45, 28469),

Gene: SunsetPointe\_36 Start: 27044, Stop: 27406, Start Num: 23

Candidate Starts for SunsetPointe\_36:

(7, 26864), (11, 26981), (13, 26990), (Start: 23 @27044 has 61 MA's), (31, 27200), (36, 27251), (39, 27305), (40, 27314), (45, 27359),

Gene: Supernova\_32 Start: 21669, Stop: 21313, Start Num: 21

Candidate Starts for Supernova\_32:

(15, 21702), (Start: 21 @21669 has 34 MA's), (31, 21510), (35, 21468), (42, 21390), (43, 21387), (45, 21351),

Gene: Superstar\_40 Start: 29217, Stop: 29594, Start Num: 22

Candidate Starts for Superstar\_40:

(Start: 18 @29205 has 2 MA's), (Start: 19 @29208 has 1 MA's), (Start: 22 @29217 has 26 MA's), (29, 29358), (31, 29391), (41, 29508), (45, 29550),

Gene: TagePhighter\_38 Start: 27425, Stop: 27787, Start Num: 23

Candidate Starts for TagePhighter\_38:

(7, 27248), (11, 27362), (13, 27371), (17, 27410), (Start: 23 @27425 has 61 MA's), (36, 27632), (39, 27686), (40, 27695), (43, 27704), (45, 27740),

Gene: Tefunt\_38 Start: 28104, Stop: 28481, Start Num: 22

Candidate Starts for Tefunt\_38:

(Start: 19 @28095 has 1 MA's), (Start: 22 @28104 has 26 MA's), (31, 28278), (34, 28314), (42, 28398), (45, 28437),

Gene: Thestral\_38 Start: 28297, Stop: 28674, Start Num: 22

Candidate Starts for Thestral\_38:

(Start: 19 @28288 has 1 MA's), (Start: 22 @28297 has 26 MA's), (31, 28471), (34, 28507), (45, 28630),

Gene: TinaBelcher\_37 Start: 28244, Stop: 28621, Start Num: 22

Candidate Starts for TinaBelcher\_37:

(Start: 19 @28235 has 1 MA's), (Start: 22 @28244 has 26 MA's), (31, 28418), (34, 28454), (45, 28577),

Gene: Toma\_36 Start: 27871, Stop: 28233, Start Num: 23

Candidate Starts for Toma\_36:

(7, 27691), (11, 27808), (13, 27817), (Start: 23 @27871 has 61 MA's), (36, 28078), (39, 28132), (40, 28141), (41, 28144), (43, 28150), (45, 28186),

Gene: Triste\_36 Start: 27413, Stop: 27775, Start Num: 23

Candidate Starts for Triste\_36:

(7, 27236), (11, 27350), (13, 27359), (17, 27398), (Start: 23 @27413 has 61 MA's), (36, 27620), (39, 27674), (40, 27683), (43, 27692), (45, 27728),

Gene: Triumph\_38 Start: 27999, Stop: 28376, Start Num: 22

Candidate Starts for Triumph\_38:

(9, 27894), (11, 27936), (Start: 18 @27987 has 2 MA's), (Start: 19 @27990 has 1 MA's), (Start: 22 @27999 has 26 MA's), (31, 28173), (41, 28290), (45, 28332),

Gene: TrvxScott\_36 Start: 28281, Stop: 28667, Start Num: 19

Candidate Starts for TrvxScott\_36:

(Start: 19 @28281 has 1 MA's), (Start: 22 @28290 has 26 MA's), (31, 28464), (34, 28500), (45, 28623),

Gene: TuanPN\_35 Start: 27357, Stop: 27719, Start Num: 23

Candidate Starts for TuanPN\_35:

(7, 27177), (11, 27294), (Start: 23 @27357 has 61 MA's), (36, 27564), (39, 27618), (40, 27627), (43, 27636), (45, 27672),

Gene: Unstoppable\_36 Start: 27048, Stop: 27410, Start Num: 23

Candidate Starts for Unstoppable\_36:

(7, 26868), (11, 26985), (13, 26994), (Start: 23 @27048 has 61 MA's), (31, 27204), (36, 27255), (39, 27309), (40, 27318), (45, 27363),

Gene: Urza\_38 Start: 27858, Stop: 28232, Start Num: 22

Candidate Starts for Urza\_38:

(Start: 19 @27849 has 1 MA's), (Start: 22 @27858 has 26 MA's), (Start: 26 @27912 has 1 MA's), (31, 28026), (36, 28077), (41, 28143), (43, 28149), (45, 28185), (47, 28215),

Gene: Vanseggelen\_42 Start: 28601, Stop: 28966, Start Num: 23

Candidate Starts for Vanseggelen\_42:

(Start: 23 @28601 has 61 MA's), (32, 28784), (36, 28811), (41, 28877),

Gene: Verabelle\_40 Start: 28933, Stop: 29355, Start Num: 12

Candidate Starts for Verabelle\_40:

(10, 28906), (12, 28933), (Start: 23 @28993 has 61 MA's), (25, 29044), (32, 29176), (35, 29194), (36, 29203), (41, 29269), (43, 29275),

Gene: Verse\_37 Start: 29752, Stop: 30117, Start Num: 23

Candidate Starts for Verse\_37:

(Start: 23 @29752 has 61 MA's), (32, 29935), (36, 29962), (41, 30028),

Gene: VieEnRose\_37 Start: 27779, Stop: 28156, Start Num: 22

Candidate Starts for VieEnRose\_37:

(Start: 19 @27770 has 1 MA's), (Start: 22 @27779 has 26 MA's), (Start: 26 @27836 has 1 MA's), (31, 27950), (36, 28001), (41, 28067), (43, 28073), (45, 28109),

Gene: Werner\_36 Start: 27423, Stop: 27785, Start Num: 23

Candidate Starts for Werner\_36:

(7, 27246), (11, 27360), (13, 27369), (17, 27408), (Start: 23 @27423 has 61 MA's), (36, 27630), (39, 27684), (40, 27693), (43, 27702), (45, 27738),

Gene: Whatever\_36 Start: 27423, Stop: 27785, Start Num: 23

Candidate Starts for Whatever\_36:

(7, 27246), (11, 27360), (13, 27369), (17, 27408), (Start: 23 @27423 has 61 MA's), (36, 27630), (39, 27684), (40, 27693), (43, 27702), (45, 27738),

Gene: Wizzo\_32 Start: 21394, Stop: 21038, Start Num: 21

Candidate Starts for Wizzo\_32:

(2, 21841), (3, 21748), (15, 21427), (Start: 21 @21394 has 34 MA's), (35, 21193), (42, 21115), (43, 21112), (45, 21076),

Gene: Yasdnii\_36 Start: 27475, Stop: 27837, Start Num: 23

Candidate Starts for Yasdnii\_36:

(7, 27295), (11, 27412), (Start: 23 @27475 has 61 MA's), (36, 27682), (39, 27736), (40, 27745), (43, 27754), (45, 27790),

Gene: Yosif\_39 Start: 29550, Stop: 29933, Start Num: 23

Candidate Starts for Yosif\_39:

(Start: 23 @29550 has 61 MA's), (29, 29682), (31, 29727), (45, 29886),

Gene: Zainub\_43 Start: 28633, Stop: 29010, Start Num: 22

Candidate Starts for Zainub\_43:

(Start: 19 @28624 has 1 MA's), (Start: 22 @28633 has 26 MA's), (31, 28807), (34, 28843), (41, 28924), (45, 28966),

Gene: Zemlya\_38 Start: 27972, Stop: 28334, Start Num: 23

Candidate Starts for Zemlya\_38:

(7, 27792), (11, 27909), (13, 27918), (Start: 23 @27972 has 61 MA's), (36, 28179), (39, 28233), (40, 28242), (41, 28245), (43, 28251), (45, 28287),

Gene: phiCAM\_36 Start: 30877, Stop: 31242, Start Num: 23

Candidate Starts for phiCAM\_36:

(Start: 23 @30877 has 61 MA's), (25, 30928), (32, 31060), (35, 31078), (36, 31087), (41, 31153), (43, 31159), (45, 31195),

Gene: phiHau3\_38 Start: 27506, Stop: 27880, Start Num: 24

Candidate Starts for phiHau3\_38:

(4, 27191), (5, 27212), (6, 27317), (8, 27341), (14, 27458), (Start: 24 @27506 has 3 MA's), (25, 27569), (28, 27626), (31, 27677), (36, 27728), (39, 27782), (46, 27848),