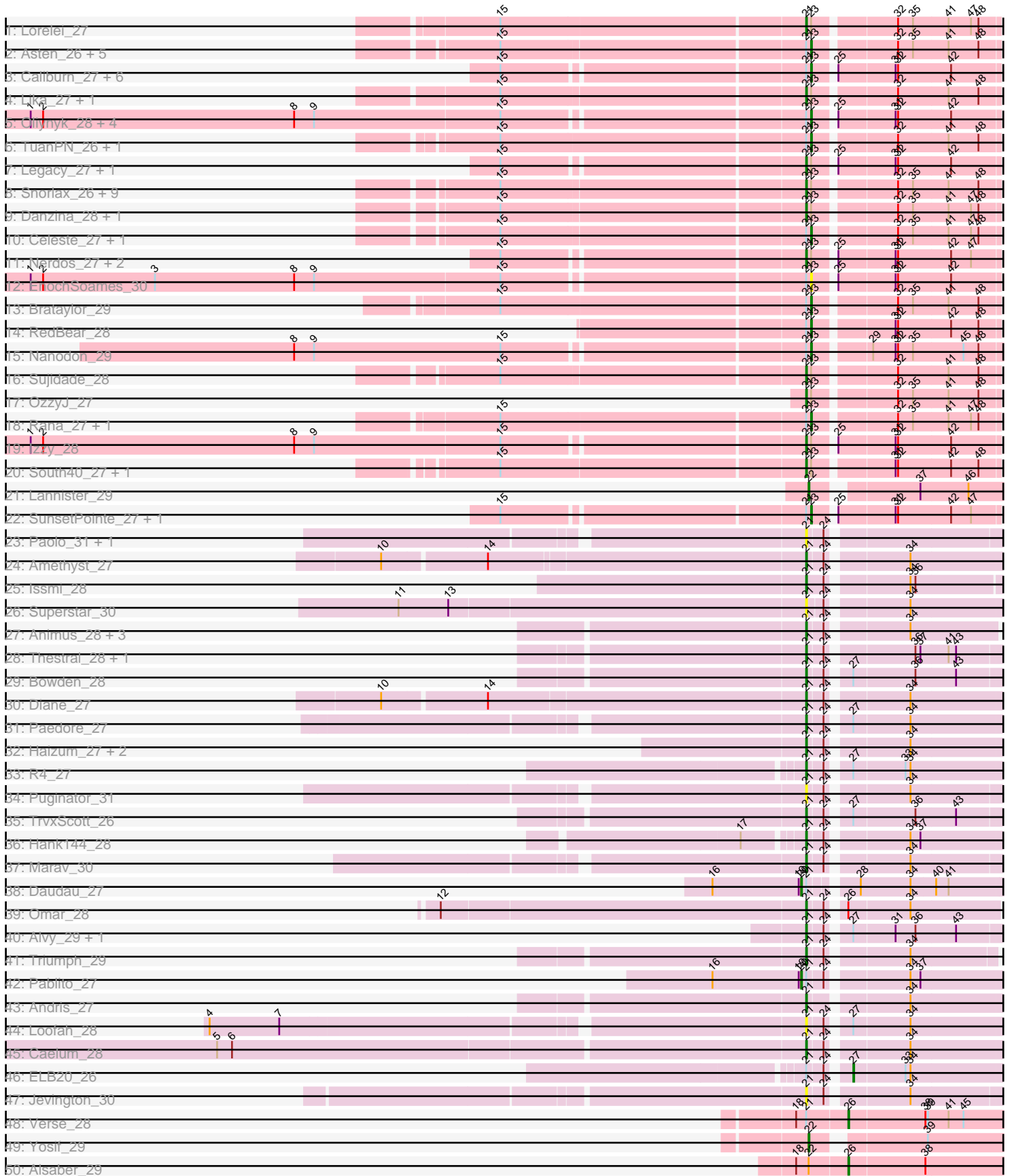


# Pham 157749



## Pham 157749

[illegible]

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 157749 Report

This analysis was run 04/28/24 on database version 559.

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 157749 has 102 members, 15 are drafts.

Phages represented in each track:

- Track 1 : Lorelei\_27
- Track 2 : Asten\_26, Toma\_27, Maneekul\_26, Yasdnil\_26, Goby\_27, Emaanora\_28
- Track 3 : Caliburn\_27, BeardedLady\_28, Leviticus\_27, Aaronocolus\_27, Phettuccine\_27, Hydra\_29, Ozzie\_27
- Track 4 : Lika\_27, Godpower\_28
- Track 5 : Oliynyk\_28, Jash\_28, BryanRecycles\_28, Eddasa\_28, Rusticus\_28
- Track 6 : TuanPN\_26, Ejemplo\_26
- Track 7 : Legacy\_27, Unstoppable\_27
- Track 8 : Snorlax\_26, Hippo\_26, Werner\_26, Dwayne\_26, SarahRose\_26, Chucky\_26, BarryBee\_28, TagePhighter\_27, Whatever\_26, Triste\_26
- Track 9 : Danzina\_28, Zemlya\_28
- Track 10 : Celeste\_27, Dattran\_28
- Track 11 : Nerdos\_27, Indigo\_26, Esperer\_27
- Track 12 : EnochSoames\_30
- Track 13 : Brataylor\_29
- Track 14 : RedBear\_28
- Track 15 : Nanodon\_29
- Track 16 : Sujidade\_28
- Track 17 : OzzyJ\_27
- Track 18 : Rana\_27, Nabi\_27
- Track 19 : Izzy\_28
- Track 20 : South40\_27, Katalie\_27
- Track 21 : Lannister\_29
- Track 22 : SunsetPointe\_27, Bovely\_27
- Track 23 : Paolo\_31, Zainub\_33
- Track 24 : Amethyst\_27
- Track 25 : Issmi\_28
- Track 26 : Superstar\_30
- Track 27 : Animus\_28, SqueakyClean\_28, GirlDinner\_28, Janus\_28
- Track 28 : Thestral\_28, TinaBelcher\_27
- Track 29 : Bowden\_28
- Track 30 : Diane\_27
- Track 31 : Paedore\_27

- Track 32 : Haizum\_27, Nishikigoi\_27, Tefunt\_27
- Track 33 : R4\_27
- Track 34 : Puginator\_31
- Track 35 : TrvxScott\_26
- Track 36 : Hank144\_28
- Track 37 : Marav\_30
- Track 38 : Daudau\_27
- Track 39 : Omar\_28
- Track 40 : Alvy\_29, BartholomewSD\_29
- Track 41 : Triumph\_29
- Track 42 : Pablito\_27
- Track 43 : Andris\_27
- Track 44 : Loofah\_28
- Track 45 : Caelum\_28
- Track 46 : ELB20\_26
- Track 47 : Jevington\_30
- Track 48 : Verse\_28
- Track 49 : Yosif\_29
- Track 50 : Alsaber\_29
- Track 51 : Saftant\_28
- Track 52 : Celery\_31
- Track 53 : Dexers\_27
- Track 54 : phiCAM\_29
- Track 55 : Amela\_28
- Track 56 : Conan\_31
- Track 57 : ElGato\_30, Provolone\_29
- Track 58 : Verabelle\_30
- Track 59 : Vanseggelen\_33

***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 50 of the 87 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

• Alvy\_29, Amela\_28, Amethyst\_27, Andris\_27, Animus\_28, BarryBee\_28, BartholomewSD\_29, Bowden\_28, Caelum\_28, Chucky\_26, Danzina\_28, Diane\_27, Dwayne\_26, Esperer\_27, GirlDinner\_28, Godpower\_28, Haizum\_27, Hank144\_28, Hippo\_26, Indigo\_26, Issmi\_28, Izzy\_28, Janus\_28, Jevington\_30, Katalie\_27, Legacy\_27, Lika\_27, Loofah\_28, Lorelei\_27, Marav\_30, Nerdos\_27, Nishikigoi\_27, Omar\_28, OzzyJ\_27, Paedore\_27, Paolo\_31, Puginator\_31, R4\_27, Saftant\_28, SarahRose\_26, Snorlax\_26, South40\_27, SqueakyClean\_28, Sujidade\_28, Superstar\_30, TagePhighter\_27, Tefunt\_27, Thestral\_28, TinaBelcher\_27, Triste\_26, Triumph\_29, TrvxScott\_26, Unstoppable\_27, Verabelle\_30, Werner\_26, Whatever\_26, Zainub\_33, Zemlya\_28, phiCAM\_29,

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

• Aaronocolus\_27, Asten\_26, BeardedLady\_28, Bovely\_27, Brataylor\_29, BryanRecycles\_28, Caliburn\_27, Celery\_31, Celeste\_27, Dattran\_28, Daudau\_27, ELB20\_26, Eddasa\_28, Ejemplo\_26, Emaanora\_28, EnochSoames\_30, Goby\_27,

Hydra\_29, Jash\_28, Leviticus\_27, Maneekul\_26, Nabi\_27, Nanodon\_29, Oliynyk\_28, Ozzie\_27, Pablito\_27, Phettuccine\_27, Rana\_27, RedBear\_28, Rusticus\_28, SunsetPointe\_27, Toma\_27, TuanPN\_26, Verse\_28, Yasdnil\_26,

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

• Alsaber\_29, Conan\_31, Dexers\_27, ElGato\_30, Lannister\_29, Provolone\_29, Vanseggelen\_33, Yosif\_29,

### Summary by start number:

Start 18:

- Found in 12 of 102 ( 11.8% ) of genes in pham
- Manual Annotations of this start: 1 of 87
- Called 25.0% of time when present
- Phage (with cluster) where this start called: Celery\_31 (BD3), Conan\_31 (BD3), Dexers\_27 (BD3),

Start 20:

- Found in 2 of 102 ( 2.0% ) of genes in pham
- Manual Annotations of this start: 2 of 87
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Daudau\_27 (BD2), Pablito\_27 (BD2),

Start 21:

- Found in 94 of 102 ( 92.2% ) of genes in pham
- Manual Annotations of this start: 50 of 87
- Called 62.8% of time when present
- Phage (with cluster) where this start called: Alvy\_29 (BD2), Amela\_28 (BD3), Amethyst\_27 (BD2), Andris\_27 (BD2), Animus\_28 (BD2), BarryBee\_28 (BD1), BartholomewSD\_29 (BD2), Bowden\_28 (BD2), Caelum\_28 (BD2), Chucky\_26 (BD1), Danzina\_28 (BD1), Diane\_27 (BD2), Dwayne\_26 (BD1), Esperer\_27 (BD1), GirlDinner\_28 (BD2), Godpower\_28 (BD1), Haizum\_27 (BD2), Hank144\_28 (BD2), Hippo\_26 (BD1), Indigo\_26 (BD1), Issmi\_28 (BD2), Izzy\_28 (BD1), Janus\_28 (BD2), Jevington\_30 (BD2), Katalie\_27 (BD1), Legacy\_27 (BD1), Lika\_27 (BD1), Loofah\_28 (BD2), Lorelei\_27 (BD1), Marav\_30 (BD2), Nerdos\_27 (BD1), Nishikigoi\_27 (BD2), Omar\_28 (BD2), OzzyJ\_27 (BD1), Paedore\_27 (BD2), Paolo\_31 (BD2), Puginator\_31 (BD2), R4\_27 (BD2), Saftant\_28 (BD3), SarahRose\_26 (BD1), Snorlax\_26 (BD1), South40\_27 (BD1), SqueakyClean\_28 (BD2), Sujidade\_28 (BD1), Superstar\_30 (BD2), TagePhighter\_27 (BD1), Tefunt\_27 (BD2), Thestral\_28 (BD2), TinaBelcher\_27 (BD2), Triste\_26 (BD1), Triumph\_29 (BD2), TrvxScott\_26 (BD2), Unstoppable\_27 (BD1), Verabelle\_30 (BD3), Werner\_26 (BD1), Whatever\_26 (BD1), Zainub\_33 (BD2), Zemlya\_28 (BD1), phiCAM\_29 (BD3),

Start 22:

- Found in 8 of 102 ( 7.8% ) of genes in pham
- Manual Annotations of this start: 3 of 87
- Called 62.5% of time when present
- Phage (with cluster) where this start called: ElGato\_30 (BD3), Lannister\_29 (BD1), Provolone\_29 (BD3), Vanseggelen\_33 (BD3), Yosif\_29 (BD3),

Start 23:

- Found in 55 of 102 ( 53.9% ) of genes in pham
- Manual Annotations of this start: 28 of 87

- Called 54.5% of time when present
- Phage (with cluster) where this start called: Aaronocolus\_27 (BD1), Asten\_26 (BD1), BeardedLady\_28 (BD1), Bovely\_27 (BD1), Brataylor\_29 (BD1), BryanRecycles\_28 (BD1), Caliburn\_27 (BD1), Celeste\_27 (BD1), Dattran\_28 (BD1), Eddasa\_28 (BD1), Ejemplo\_26 (BD1), Emaanora\_28 (BD1), EnochSoames\_30 (BD1), Goby\_27 (BD1), Hydra\_29 (BD1), Jash\_28 (BD1), Leviticus\_27 (BD1), Maneekul\_26 (BD1), Nabi\_27 (BD1), Nanodon\_29 (BD1), Oliynyk\_28 (BD1), Ozzie\_27 (BD1), Phettuccine\_27 (BD1), Rana\_27 (BD1), RedBear\_28 (BD1), Rusticus\_28 (BD1), SunsetPointe\_27 (BD1), Toma\_27 (BD1), TuanPN\_26 (BD1), Yasdnil\_26 (BD1),

Start 26:

- Found in 13 of 102 ( 12.7% ) of genes in pham
- Manual Annotations of this start: 2 of 87
- Called 15.4% of time when present
- Phage (with cluster) where this start called: Alsaber\_29 (BD3), Verse\_28 (BD3),

Start 27:

- Found in 8 of 102 ( 7.8% ) of genes in pham
- Manual Annotations of this start: 1 of 87
- Called 12.5% of time when present
- Phage (with cluster) where this start called: ELB20\_26 (BD2),

### **Summary by clusters:**

There are 3 clusters represented in this pham: BD1, BD3, BD2,

Info for manual annotations of cluster BD1:

- Start number 21 was manually annotated 25 times for cluster BD1.
- Start number 22 was manually annotated 1 time for cluster BD1.
- Start number 23 was manually annotated 28 times for cluster BD1.

Info for manual annotations of cluster BD2:

- Start number 20 was manually annotated 2 times for cluster BD2.
- Start number 21 was manually annotated 23 times for cluster BD2.
- Start number 27 was manually annotated 1 time for cluster BD2.

Info for manual annotations of cluster BD3:

- Start number 18 was manually annotated 1 time for cluster BD3.
- Start number 21 was manually annotated 2 times for cluster BD3.
- Start number 22 was manually annotated 2 times for cluster BD3.
- Start number 26 was manually annotated 2 times for cluster BD3.

### **Gene Information:**

Gene: Aaronocolus\_27 Start: 21931, Stop: 22191, Start Num: 23

Candidate Starts for Aaronocolus\_27:

(15, 21580), (Start: 21 @21925 has 50 MA's), (Start: 23 @21931 has 28 MA's), (25, 21952), (31, 22018), (32, 22021), (42, 22084),

Gene: Alsaber\_29 Start: 23589, Stop: 23822, Start Num: 26

Candidate Starts for Alsaber\_29:

(Start: 18 @23529 has 1 MA's), (Start: 22 @23544 has 3 MA's), (Start: 26 @23589 has 2 MA's), (38, 23679),

Gene: Alvy\_29 Start: 22860, Stop: 23069, Start Num: 21

Candidate Starts for Alvy\_29:

(Start: 21 @22860 has 50 MA's), (24, 22878), (Start: 27 @22899 has 1 MA's), (31, 22947), (36, 22971), (43, 23019),

Gene: Amela\_28 Start: 24358, Stop: 24642, Start Num: 21

Candidate Starts for Amela\_28:

(Start: 18 @24346 has 1 MA's), (Start: 21 @24358 has 50 MA's), (Start: 26 @24406 has 2 MA's), (38, 24496), (39, 24499), (41, 24523), (45, 24541),

Gene: Amethyst\_27 Start: 22528, Stop: 22740, Start Num: 21

Candidate Starts for Amethyst\_27:

(10, 22036), (14, 22156), (Start: 21 @22528 has 50 MA's), (24, 22546), (34, 22633),

Gene: Andris\_27 Start: 22516, Stop: 22728, Start Num: 21

Candidate Starts for Andris\_27:

(Start: 21 @22516 has 50 MA's), (34, 22621),

Gene: Animus\_28 Start: 22858, Stop: 23064, Start Num: 21

Candidate Starts for Animus\_28:

(Start: 21 @22858 has 50 MA's), (24, 22876), (34, 22963),

Gene: Asten\_26 Start: 22171, Stop: 22434, Start Num: 23

Candidate Starts for Asten\_26:

(15, 21811), (Start: 21 @22165 has 50 MA's), (Start: 23 @22171 has 28 MA's), (32, 22261), (35, 22279), (41, 22321), (48, 22357),

Gene: BarryBee\_28 Start: 22175, Stop: 22444, Start Num: 21

Candidate Starts for BarryBee\_28:

(15, 21821), (Start: 21 @22175 has 50 MA's), (Start: 23 @22181 has 28 MA's), (32, 22271), (35, 22289), (41, 22331), (48, 22367),

Gene: BartholomewSD\_29 Start: 22860, Stop: 23069, Start Num: 21

Candidate Starts for BartholomewSD\_29:

(Start: 21 @22860 has 50 MA's), (24, 22878), (Start: 27 @22899 has 1 MA's), (31, 22947), (36, 22971), (43, 23019),

Gene: BeardedLady\_28 Start: 22184, Stop: 22444, Start Num: 23

Candidate Starts for BeardedLady\_28:

(15, 21833), (Start: 21 @22178 has 50 MA's), (Start: 23 @22184 has 28 MA's), (25, 22205), (31, 22271), (32, 22274), (42, 22337),

Gene: Bovely\_27 Start: 21937, Stop: 22197, Start Num: 23

Candidate Starts for Bovely\_27:

(15, 21586), (Start: 21 @21931 has 50 MA's), (Start: 23 @21937 has 28 MA's), (25, 21958), (31, 22024), (32, 22027), (42, 22090), (47, 22114),

Gene: Bowden\_28 Start: 22785, Stop: 22994, Start Num: 21

Candidate Starts for Bowden\_28:

(Start: 21 @22785 has 50 MA's), (24, 22803), (Start: 27 @22824 has 1 MA's), (36, 22896), (43, 22944),

Gene: Brataylor\_29 Start: 23190, Stop: 23453, Start Num: 23

Candidate Starts for Brataylor\_29:

(15, 22827), (Start: 21 @23184 has 50 MA's), (Start: 23 @23190 has 28 MA's), (32, 23280), (35, 23298), (41, 23340), (48, 23376),

Gene: BryanRecycles\_28 Start: 22288, Stop: 22548, Start Num: 23

Candidate Starts for BryanRecycles\_28:

(1, 21373), (2, 21388), (8, 21691), (9, 21715), (15, 21937), (Start: 21 @22282 has 50 MA's), (Start: 23 @22288 has 28 MA's), (25, 22309), (31, 22375), (32, 22378), (42, 22441),

Gene: Caelum\_28 Start: 22499, Stop: 22711, Start Num: 21

Candidate Starts for Caelum\_28:

(5, 21806), (6, 21824), (Start: 21 @22499 has 50 MA's), (24, 22517), (34, 22604),

Gene: Caliburn\_27 Start: 21914, Stop: 22174, Start Num: 23

Candidate Starts for Caliburn\_27:

(15, 21563), (Start: 21 @21908 has 50 MA's), (Start: 23 @21914 has 28 MA's), (25, 21935), (31, 22001), (32, 22004), (42, 22067),

Gene: Celery\_31 Start: 23463, Stop: 23756, Start Num: 18

Candidate Starts for Celery\_31:

(Start: 18 @23463 has 1 MA's), (Start: 21 @23475 has 50 MA's), (Start: 26 @23523 has 2 MA's), (44, 23652),

Gene: Celeste\_27 Start: 22637, Stop: 22900, Start Num: 23

Candidate Starts for Celeste\_27:

(15, 22277), (Start: 21 @22631 has 50 MA's), (Start: 23 @22637 has 28 MA's), (32, 22727), (35, 22745), (41, 22787), (47, 22814), (48, 22823),

Gene: Chucky\_26 Start: 22179, Stop: 22448, Start Num: 21

Candidate Starts for Chucky\_26:

(15, 21825), (Start: 21 @22179 has 50 MA's), (Start: 23 @22185 has 28 MA's), (32, 22275), (35, 22293), (41, 22335), (48, 22371),

Gene: Conan\_31 Start: 23428, Stop: 23721, Start Num: 18

Candidate Starts for Conan\_31:

(Start: 18 @23428 has 1 MA's), (Start: 22 @23443 has 3 MA's), (Start: 26 @23488 has 2 MA's), (38, 23578),

Gene: Danzina\_28 Start: 22932, Stop: 23201, Start Num: 21

Candidate Starts for Danzina\_28:

(15, 22578), (Start: 21 @22932 has 50 MA's), (Start: 23 @22938 has 28 MA's), (32, 23028), (35, 23046), (41, 23088), (47, 23115), (48, 23124),

Gene: Dattran\_28 Start: 22747, Stop: 23010, Start Num: 23

Candidate Starts for Dattran\_28:

(15, 22387), (Start: 21 @22741 has 50 MA's), (Start: 23 @22747 has 28 MA's), (32, 22837), (35, 22855), (41, 22897), (47, 22924), (48, 22933),

Gene: Daudau\_27 Start: 22524, Stop: 22754, Start Num: 20



Candidate Starts for Daudau\_27:

(16, 22419), (19, 22521), (Start: 20 @22524 has 2 MA's), (Start: 21 @22530 has 50 MA's), (28, 22575), (34, 22635), (40, 22665), (41, 22680),

Gene: Dexers\_27 Start: 23450, Stop: 23743, Start Num: 18

Candidate Starts for Dexers\_27:

(Start: 18 @23450 has 1 MA's), (Start: 22 @23465 has 3 MA's), (Start: 26 @23510 has 2 MA's), (38, 23600),

Gene: Diane\_27 Start: 22864, Stop: 23076, Start Num: 21

Candidate Starts for Diane\_27:

(10, 22369), (14, 22489), (Start: 21 @22864 has 50 MA's), (24, 22882), (34, 22969),

Gene: Dwayne\_26 Start: 22166, Stop: 22435, Start Num: 21

Candidate Starts for Dwayne\_26:

(15, 21812), (Start: 21 @22166 has 50 MA's), (Start: 23 @22172 has 28 MA's), (32, 22262), (35, 22280), (41, 22322), (48, 22358),

Gene: ELB20\_26 Start: 22980, Stop: 23153, Start Num: 27

Candidate Starts for ELB20\_26:

(Start: 21 @22941 has 50 MA's), (24, 22959), (Start: 27 @22980 has 1 MA's), (33, 23040), (34, 23046),

Gene: Eddasa\_28 Start: 22288, Stop: 22548, Start Num: 23

Candidate Starts for Eddasa\_28:

(1, 21373), (2, 21388), (8, 21691), (9, 21715), (15, 21937), (Start: 21 @22282 has 50 MA's), (Start: 23 @22288 has 28 MA's), (25, 22309), (31, 22375), (32, 22378), (42, 22441),

Gene: Ejemplo\_26 Start: 22207, Stop: 22467, Start Num: 23

Candidate Starts for Ejemplo\_26:

(15, 21844), (Start: 21 @22201 has 50 MA's), (Start: 23 @22207 has 28 MA's), (32, 22297), (41, 22357), (48, 22393),

Gene: ElGato\_30 Start: 23103, Stop: 23381, Start Num: 22

Candidate Starts for ElGato\_30:

(Start: 18 @23088 has 1 MA's), (Start: 22 @23103 has 3 MA's), (Start: 26 @23148 has 2 MA's), (38, 23238),

Gene: Emaanora\_28 Start: 22130, Stop: 22393, Start Num: 23

Candidate Starts for Emaanora\_28:

(15, 21770), (Start: 21 @22124 has 50 MA's), (Start: 23 @22130 has 28 MA's), (32, 22220), (35, 22238), (41, 22280), (48, 22316),

Gene: EnochSoames\_30 Start: 22283, Stop: 22543, Start Num: 23

Candidate Starts for EnochSoames\_30:

(1, 21368), (2, 21383), (3, 21518), (8, 21686), (9, 21710), (15, 21932), (Start: 21 @22277 has 50 MA's), (Start: 23 @22283 has 28 MA's), (25, 22304), (31, 22370), (32, 22373), (42, 22436),

Gene: Esperer\_27 Start: 21744, Stop: 22010, Start Num: 21

Candidate Starts for Esperer\_27:

(15, 21399), (Start: 21 @21744 has 50 MA's), (Start: 23 @21750 has 28 MA's), (25, 21771), (31, 21837), (32, 21840), (42, 21903), (47, 21927),

Gene: GirlDinner\_28 Start: 22520, Stop: 22726, Start Num: 21

Candidate Starts for GirlDinner\_28:

(Start: 21 @22520 has 50 MA's), (24, 22538), (34, 22625),

Gene: Goby\_27 Start: 22752, Stop: 23015, Start Num: 23

Candidate Starts for Goby\_27:

(15, 22392), (Start: 21 @22746 has 50 MA's), (Start: 23 @22752 has 28 MA's), (32, 22842), (35, 22860), (41, 22902), (48, 22938),

Gene: Godpower\_28 Start: 22745, Stop: 23014, Start Num: 21

Candidate Starts for Godpower\_28:

(15, 22391), (Start: 21 @22745 has 50 MA's), (Start: 23 @22751 has 28 MA's), (32, 22841), (41, 22901), (48, 22937),

Gene: Haizum\_27 Start: 22538, Stop: 22750, Start Num: 21

Candidate Starts for Haizum\_27:

(Start: 21 @22538 has 50 MA's), (24, 22556), (34, 22643),

Gene: Hank144\_28 Start: 22954, Stop: 23166, Start Num: 21

Candidate Starts for Hank144\_28:

(17, 22891), (Start: 21 @22954 has 50 MA's), (24, 22972), (34, 23059), (37, 23071),

Gene: Hippo\_26 Start: 22175, Stop: 22444, Start Num: 21

Candidate Starts for Hippo\_26:

(15, 21821), (Start: 21 @22175 has 50 MA's), (Start: 23 @22181 has 28 MA's), (32, 22271), (35, 22289), (41, 22331), (48, 22367),

Gene: Hydra\_29 Start: 22462, Stop: 22722, Start Num: 23

Candidate Starts for Hydra\_29:

(15, 22111), (Start: 21 @22456 has 50 MA's), (Start: 23 @22462 has 28 MA's), (25, 22483), (31, 22549), (32, 22552), (42, 22615),

Gene: Indigo\_26 Start: 21924, Stop: 22190, Start Num: 21

Candidate Starts for Indigo\_26:

(15, 21579), (Start: 21 @21924 has 50 MA's), (Start: 23 @21930 has 28 MA's), (25, 21951), (31, 22017), (32, 22020), (42, 22083), (47, 22107),

Gene: Issmi\_28 Start: 23141, Stop: 23353, Start Num: 21

Candidate Starts for Issmi\_28:

(Start: 21 @23141 has 50 MA's), (24, 23162), (34, 23249), (36, 23255),

Gene: Izzy\_28 Start: 22329, Stop: 22595, Start Num: 21

Candidate Starts for Izzy\_28:

(1, 21420), (2, 21435), (8, 21738), (9, 21762), (15, 21984), (Start: 21 @22329 has 50 MA's), (Start: 23 @22335 has 28 MA's), (25, 22356), (31, 22422), (32, 22425), (42, 22488),

Gene: Janus\_28 Start: 22858, Stop: 23064, Start Num: 21

Candidate Starts for Janus\_28:

(Start: 21 @22858 has 50 MA's), (24, 22876), (34, 22963),

Gene: Jash\_28 Start: 22288, Stop: 22548, Start Num: 23

Candidate Starts for Jash\_28:

(1, 21373), (2, 21388), (8, 21691), (9, 21715), (15, 21937), (Start: 21 @22282 has 50 MA's), (Start: 23 @22288 has 28 MA's), (25, 22309), (31, 22375), (32, 22378), (42, 22441),

Gene: Jevington\_30 Start: 23193, Stop: 23402, Start Num: 21

Candidate Starts for Jevington\_30:

(Start: 21 @23193 has 50 MA's), (24, 23211), (34, 23298),

Gene: Katalie\_27 Start: 22461, Stop: 22727, Start Num: 21

Candidate Starts for Katalie\_27:

(15, 22104), (Start: 21 @22461 has 50 MA's), (Start: 23 @22467 has 28 MA's), (31, 22554), (32, 22557), (42, 22620), (48, 22653),

Gene: Lannister\_29 Start: 22999, Stop: 23220, Start Num: 22

Candidate Starts for Lannister\_29:

(Start: 22 @22999 has 3 MA's), (37, 23107), (46, 23164),

Gene: Legacy\_27 Start: 21899, Stop: 22165, Start Num: 21

Candidate Starts for Legacy\_27:

(15, 21554), (Start: 21 @21899 has 50 MA's), (Start: 23 @21905 has 28 MA's), (25, 21926), (31, 21992), (32, 21995), (42, 22058),

Gene: Leviticus\_27 Start: 21934, Stop: 22194, Start Num: 23

Candidate Starts for Leviticus\_27:

(15, 21583), (Start: 21 @21928 has 50 MA's), (Start: 23 @21934 has 28 MA's), (25, 21955), (31, 22021), (32, 22024), (42, 22087),

Gene: Lika\_27 Start: 22749, Stop: 23018, Start Num: 21

Candidate Starts for Lika\_27:

(15, 22395), (Start: 21 @22749 has 50 MA's), (Start: 23 @22755 has 28 MA's), (32, 22845), (41, 22905), (48, 22941),

Gene: Loofah\_28 Start: 22838, Stop: 23050, Start Num: 21

Candidate Starts for Loofah\_28:

(4, 22157), (7, 22241), (Start: 21 @22838 has 50 MA's), (24, 22856), (Start: 27 @22877 has 1 MA's), (34, 22943),

Gene: Lorelei\_27 Start: 22718, Stop: 22987, Start Num: 21

Candidate Starts for Lorelei\_27:

(15, 22361), (Start: 21 @22718 has 50 MA's), (Start: 23 @22724 has 28 MA's), (32, 22814), (35, 22832), (41, 22874), (47, 22901), (48, 22910),

Gene: Maneekul\_26 Start: 22206, Stop: 22466, Start Num: 23

Candidate Starts for Maneekul\_26:

(15, 21843), (Start: 21 @22200 has 50 MA's), (Start: 23 @22206 has 28 MA's), (32, 22296), (35, 22314), (41, 22356), (48, 22392),

Gene: Marav\_30 Start: 23529, Stop: 23738, Start Num: 21

Candidate Starts for Marav\_30:

(Start: 21 @23529 has 50 MA's), (24, 23547), (34, 23634),

Gene: Nabi\_27 Start: 22724, Stop: 22987, Start Num: 23

Candidate Starts for Nabi\_27:

(15, 22361), (Start: 21 @22718 has 50 MA's), (Start: 23 @22724 has 28 MA's), (32, 22814), (35, 22832), (41, 22874), (47, 22901), (48, 22910),

Gene: Nanodon\_29 Start: 22564, Stop: 22827, Start Num: 23

Candidate Starts for Nanodon\_29:

(8, 21964), (9, 21988), (15, 22213), (Start: 21 @22558 has 50 MA's), (Start: 23 @22564 has 28 MA's), (29, 22624), (31, 22651), (32, 22654), (35, 22672), (45, 22732), (48, 22750),

Gene: Nerdos\_27 Start: 21922, Stop: 22188, Start Num: 21

Candidate Starts for Nerdos\_27:

(15, 21577), (Start: 21 @21922 has 50 MA's), (Start: 23 @21928 has 28 MA's), (25, 21949), (31, 22015), (32, 22018), (42, 22081), (47, 22105),

Gene: Nishikigoi\_27 Start: 22538, Stop: 22750, Start Num: 21

Candidate Starts for Nishikigoi\_27:

(Start: 21 @22538 has 50 MA's), (24, 22556), (34, 22643),

Gene: Oliynyk\_28 Start: 22288, Stop: 22548, Start Num: 23

Candidate Starts for Oliynyk\_28:

(1, 21373), (2, 21388), (8, 21691), (9, 21715), (15, 21937), (Start: 21 @22282 has 50 MA's), (Start: 23 @22288 has 28 MA's), (25, 22309), (31, 22375), (32, 22378), (42, 22441),

Gene: Omar\_28 Start: 22805, Stop: 23014, Start Num: 21

Candidate Starts for Omar\_28:

(12, 22373), (Start: 21 @22805 has 50 MA's), (24, 22823), (Start: 26 @22838 has 2 MA's), (34, 22910),

Gene: Ozzie\_27 Start: 21914, Stop: 22174, Start Num: 23

Candidate Starts for Ozzie\_27:

(15, 21563), (Start: 21 @21908 has 50 MA's), (Start: 23 @21914 has 28 MA's), (25, 21935), (31, 22001), (32, 22004), (42, 22067),

Gene: OzzyJ\_27 Start: 22166, Stop: 22435, Start Num: 21

Candidate Starts for OzzyJ\_27:

(Start: 21 @22166 has 50 MA's), (Start: 23 @22172 has 28 MA's), (32, 22262), (35, 22280), (41, 22322), (48, 22358),

Gene: Pablito\_27 Start: 22406, Stop: 22624, Start Num: 20

Candidate Starts for Pablito\_27:

(16, 22301), (19, 22403), (Start: 20 @22406 has 2 MA's), (Start: 21 @22412 has 50 MA's), (24, 22430), (34, 22517), (37, 22529),

Gene: Paedore\_27 Start: 22838, Stop: 23050, Start Num: 21

Candidate Starts for Paedore\_27:

(Start: 21 @22838 has 50 MA's), (24, 22856), (Start: 27 @22877 has 1 MA's), (34, 22943),

Gene: Paolo\_31 Start: 23192, Stop: 23401, Start Num: 21

Candidate Starts for Paolo\_31:

(Start: 21 @23192 has 50 MA's), (24, 23210),

Gene: Phettuccine\_27 Start: 21930, Stop: 22190, Start Num: 23

Candidate Starts for Phettuccine\_27:

(15, 21579), (Start: 21 @21924 has 50 MA's), (Start: 23 @21930 has 28 MA's), (25, 21951), (31, 22017), (32, 22020), (42, 22083),

Gene: Provolone\_29 Start: 23095, Stop: 23373, Start Num: 22

Candidate Starts for Provolone\_29:

(Start: 18 @23080 has 1 MA's), (Start: 22 @23095 has 3 MA's), (Start: 26 @23140 has 2 MA's), (38, 23230),

Gene: Puginator\_31 Start: 23207, Stop: 23416, Start Num: 21

Candidate Starts for Puginator\_31:

(Start: 21 @23207 has 50 MA's), (24, 23225), (34, 23312),

Gene: R4\_27 Start: 22952, Stop: 23164, Start Num: 21

Candidate Starts for R4\_27:

(Start: 21 @22952 has 50 MA's), (24, 22970), (Start: 27 @22991 has 1 MA's), (33, 23051), (34, 23057),

Gene: Rana\_27 Start: 22724, Stop: 22987, Start Num: 23

Candidate Starts for Rana\_27:

(15, 22361), (Start: 21 @22718 has 50 MA's), (Start: 23 @22724 has 28 MA's), (32, 22814), (35, 22832), (41, 22874), (47, 22901), (48, 22910),

Gene: RedBear\_28 Start: 22467, Stop: 22727, Start Num: 23

Candidate Starts for RedBear\_28:

(Start: 21 @22461 has 50 MA's), (Start: 23 @22467 has 28 MA's), (31, 22554), (32, 22557), (42, 22620), (48, 22653),

Gene: Rusticus\_28 Start: 22288, Stop: 22548, Start Num: 23

Candidate Starts for Rusticus\_28:

(1, 21373), (2, 21388), (8, 21691), (9, 21715), (15, 21937), (Start: 21 @22282 has 50 MA's), (Start: 23 @22288 has 28 MA's), (25, 22309), (31, 22375), (32, 22378), (42, 22441),

Gene: Saftant\_28 Start: 23714, Stop: 24013, Start Num: 21

Candidate Starts for Saftant\_28:

(Start: 18 @23702 has 1 MA's), (Start: 21 @23714 has 50 MA's), (Start: 26 @23765 has 2 MA's), (30, 23798), (37, 23849), (45, 23900), (48, 23918),

Gene: SarahRose\_26 Start: 22175, Stop: 22444, Start Num: 21

Candidate Starts for SarahRose\_26:

(15, 21821), (Start: 21 @22175 has 50 MA's), (Start: 23 @22181 has 28 MA's), (32, 22271), (35, 22289), (41, 22331), (48, 22367),

Gene: Snorlax\_26 Start: 22178, Stop: 22447, Start Num: 21

Candidate Starts for Snorlax\_26:

(15, 21824), (Start: 21 @22178 has 50 MA's), (Start: 23 @22184 has 28 MA's), (32, 22274), (35, 22292), (41, 22334), (48, 22370),

Gene: South40\_27 Start: 22461, Stop: 22727, Start Num: 21

Candidate Starts for South40\_27:

(15, 22104), (Start: 21 @22461 has 50 MA's), (Start: 23 @22467 has 28 MA's), (31, 22554), (32, 22557), (42, 22620), (48, 22653),

Gene: SqueakyClean\_28 Start: 22784, Stop: 22990, Start Num: 21

Candidate Starts for SqueakyClean\_28:

(Start: 21 @22784 has 50 MA's), (24, 22802), (34, 22889),

Gene: Sujidade\_28 Start: 23034, Stop: 23303, Start Num: 21

Candidate Starts for Sujidade\_28:

(15, 22680), (Start: 21 @23034 has 50 MA's), (Start: 23 @23040 has 28 MA's), (32, 23130), (41, 23190), (48, 23226),

Gene: SunsetPointe\_27 Start: 21921, Stop: 22181, Start Num: 23

Candidate Starts for SunsetPointe\_27:

(15, 21570), (Start: 21 @21915 has 50 MA's), (Start: 23 @21921 has 28 MA's), (25, 21942), (31, 22008), (32, 22011), (42, 22074), (47, 22098),

Gene: Superstar\_30 Start: 23733, Stop: 23945, Start Num: 21

Candidate Starts for Superstar\_30:

(11, 23250), (13, 23310), (Start: 21 @23733 has 50 MA's), (24, 23751), (34, 23838),

Gene: TagePhighter\_27 Start: 22178, Stop: 22447, Start Num: 21

Candidate Starts for TagePhighter\_27:

(15, 21824), (Start: 21 @22178 has 50 MA's), (Start: 23 @22184 has 28 MA's), (32, 22274), (35, 22292), (41, 22334), (48, 22370),

Gene: Tefunt\_27 Start: 22541, Stop: 22753, Start Num: 21

Candidate Starts for Tefunt\_27:

(Start: 21 @22541 has 50 MA's), (24, 22559), (34, 22646),

Gene: Thestral\_28 Start: 22774, Stop: 22983, Start Num: 21

Candidate Starts for Thestral\_28:

(Start: 21 @22774 has 50 MA's), (24, 22792), (36, 22885), (37, 22891), (41, 22924), (43, 22933),

Gene: TinaBelcher\_27 Start: 22721, Stop: 22930, Start Num: 21

Candidate Starts for TinaBelcher\_27:

(Start: 21 @22721 has 50 MA's), (24, 22739), (36, 22832), (37, 22838), (41, 22871), (43, 22880),

Gene: Toma\_27 Start: 22752, Stop: 23015, Start Num: 23

Candidate Starts for Toma\_27:

(15, 22392), (Start: 21 @22746 has 50 MA's), (Start: 23 @22752 has 28 MA's), (32, 22842), (35, 22860), (41, 22902), (48, 22938),

Gene: Triste\_26 Start: 22166, Stop: 22435, Start Num: 21

Candidate Starts for Triste\_26:

(15, 21812), (Start: 21 @22166 has 50 MA's), (Start: 23 @22172 has 28 MA's), (32, 22262), (35, 22280), (41, 22322), (48, 22358),

Gene: Triumph\_29 Start: 22699, Stop: 22902, Start Num: 21

Candidate Starts for Triumph\_29:

(Start: 21 @22699 has 50 MA's), (24, 22717), (34, 22804),

Gene: TrvxScott\_26 Start: 22767, Stop: 22976, Start Num: 21

Candidate Starts for TrvxScott\_26:

(Start: 21 @22767 has 50 MA's), (24, 22785), (Start: 27 @22806 has 1 MA's), (36, 22878), (43, 22926),

Gene: TuanPN\_26 Start: 22207, Stop: 22467, Start Num: 23

Candidate Starts for TuanPN\_26:

(15, 21844), (Start: 21 @22201 has 50 MA's), (Start: 23 @22207 has 28 MA's), (32, 22297), (41, 22357), (48, 22393),

Gene: Unstoppable\_27 Start: 21919, Stop: 22185, Start Num: 21

Candidate Starts for Unstoppable\_27:

(15, 21574), (Start: 21 @21919 has 50 MA's), (Start: 23 @21925 has 28 MA's), (25, 21946), (31, 22012), (32, 22015), (42, 22078),

Gene: Vanseggelen\_33 Start: 23285, Stop: 23563, Start Num: 22

Candidate Starts for Vanseggelen\_33:

(Start: 18 @23270 has 1 MA's), (Start: 22 @23285 has 3 MA's), (Start: 26 @23330 has 2 MA's), (38, 23420), (44, 23459), (48, 23483),

Gene: Verabelle\_30 Start: 23699, Stop: 23980, Start Num: 21

Candidate Starts for Verabelle\_30:

(Start: 18 @23687 has 1 MA's), (Start: 21 @23699 has 50 MA's), (Start: 26 @23747 has 2 MA's), (31, 23801), (38, 23837), (44, 23876),

Gene: Verse\_28 Start: 24400, Stop: 24636, Start Num: 26

Candidate Starts for Verse\_28:

(Start: 18 @24340 has 1 MA's), (Start: 21 @24352 has 50 MA's), (Start: 26 @24400 has 2 MA's), (38, 24490), (39, 24493), (41, 24517), (45, 24535),

Gene: Werner\_26 Start: 22176, Stop: 22445, Start Num: 21

Candidate Starts for Werner\_26:

(15, 21822), (Start: 21 @22176 has 50 MA's), (Start: 23 @22182 has 28 MA's), (32, 22272), (35, 22290), (41, 22332), (48, 22368),

Gene: Whatever\_26 Start: 22176, Stop: 22445, Start Num: 21

Candidate Starts for Whatever\_26:

(15, 21822), (Start: 21 @22176 has 50 MA's), (Start: 23 @22182 has 28 MA's), (32, 22272), (35, 22290), (41, 22332), (48, 22368),

Gene: Yasdnil\_26 Start: 22203, Stop: 22463, Start Num: 23

Candidate Starts for Yasdnil\_26:

(15, 21840), (Start: 21 @22197 has 50 MA's), (Start: 23 @22203 has 28 MA's), (32, 22293), (35, 22311), (41, 22353), (48, 22389),

Gene: Yosif\_29 Start: 23870, Stop: 24091, Start Num: 22

Candidate Starts for Yosif\_29:

(Start: 22 @23870 has 3 MA's), (39, 23987),

Gene: Zainub\_33 Start: 23156, Stop: 23365, Start Num: 21

Candidate Starts for Zainub\_33:

(Start: 21 @23156 has 50 MA's), (24, 23174),

Gene: Zemlya\_28 Start: 22738, Stop: 23007, Start Num: 21

Candidate Starts for Zemlya\_28:

(15, 22384), (Start: 21 @22738 has 50 MA's), (Start: 23 @22744 has 28 MA's), (32, 22834), (35, 22852), (41, 22894), (47, 22921), (48, 22930),

Gene: phiCAM\_29 Start: 25497, Stop: 25778, Start Num: 21

Candidate Starts for phiCAM\_29:

(Start: 18 @25485 has 1 MA's), (Start: 21 @25497 has 50 MA's), (Start: 26 @25545 has 2 MA's),