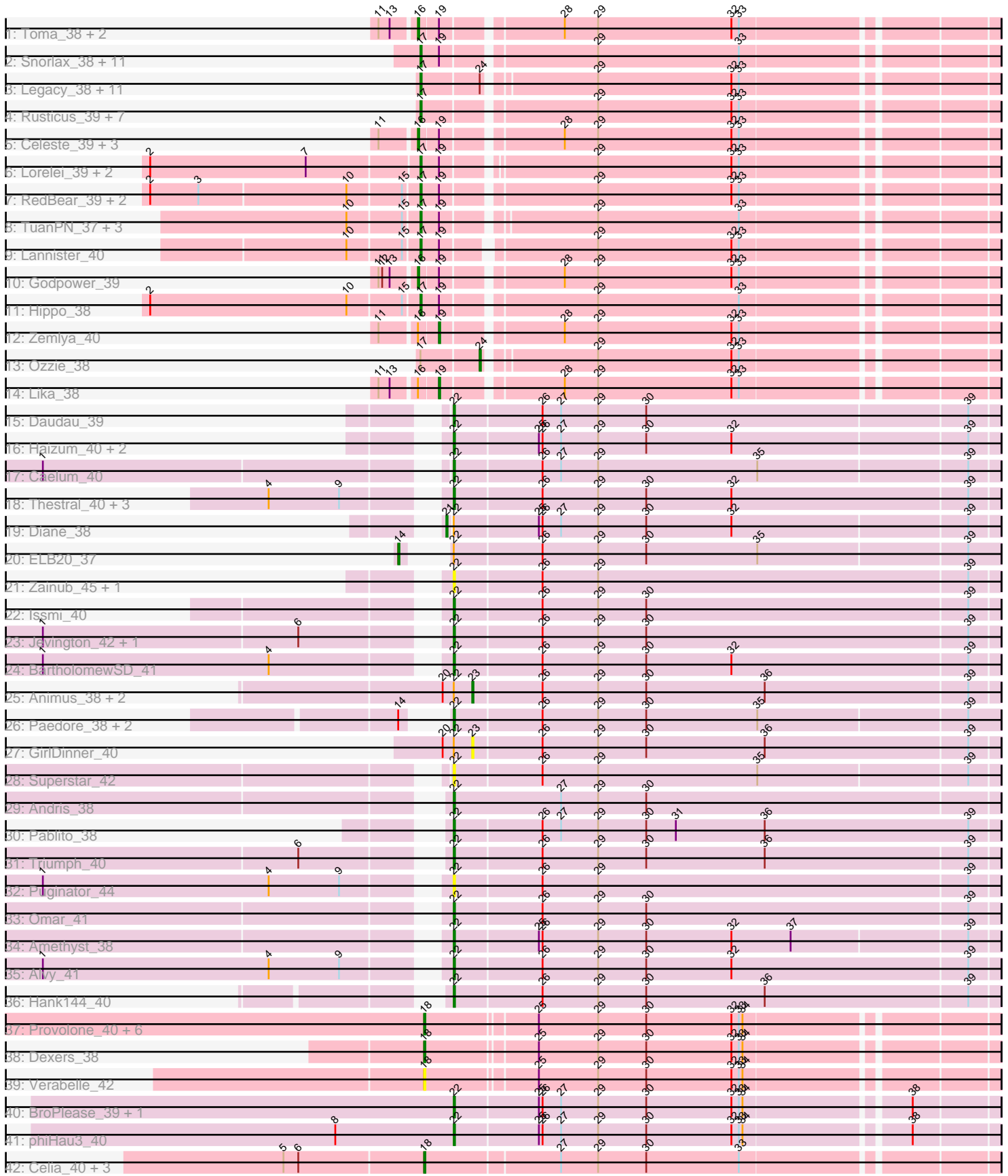


Pham 171341



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 171341 Report

This analysis was run 07/10/24 on database version 566.

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 171341 has 104 members, 12 are drafts.

Phages represented in each track:

- Track 1 : Toma\_38, Goby\_38, Sujidade\_39
- Track 2 : Snorlax\_38, Werner\_38, Emaanora\_41, Dwayne\_38, Chucky\_38, OzzyJ\_39, Triste\_38, SarahRose\_38, BarryBee\_41, Whatever\_38, TagePhighter\_40, Asten\_38
- Track 3 : Legacy\_38, Nerdos\_37, Caliburn\_38, Esperer\_38, SunsetPointe\_38, Unstoppable\_38, BeardedLady\_39, Leviticus\_38, Bovely\_38, Phettuccine\_38, Hydra\_40, Indigo\_37
- Track 4 : Rusticus\_39, EnochSoames\_41, Nanodon\_40, Izzy\_39, Jash\_39, BryanRecycles\_39, Eddasa\_39, Oliynyk\_39
- Track 5 : Celeste\_39, Brataylor\_41, Dattran\_40, Danzina\_40
- Track 6 : Lorelei\_39, Nabi\_39, Rana\_39
- Track 7 : RedBear\_39, South40\_38, Katalie\_38
- Track 8 : TuanPN\_37, Maneekul\_38, Yasdniil\_38, Ejemplo\_37
- Track 9 : Lannister\_40
- Track 10 : Godpower\_39
- Track 11 : Hippo\_38
- Track 12 : Zemlya\_40
- Track 13 : Ozzie\_38
- Track 14 : Lika\_38
- Track 15 : Daudau\_39
- Track 16 : Haizum\_40, Tefunt\_40, Nishikigoi\_40
- Track 17 : Caelum\_40
- Track 18 : Thestral\_40, Bowden\_39, TrvxScott\_38, TinaBelcher\_39
- Track 19 : Diane\_38
- Track 20 : ELB20\_37
- Track 21 : Zainub\_45, Paolo\_43
- Track 22 : Issmi\_40
- Track 23 : Jevington\_42, Marav\_42
- Track 24 : BartholomewSD\_41
- Track 25 : Animus\_38, SqueakyClean\_38, Janus\_39
- Track 26 : Paedore\_38, R4\_39, Loofah\_39
- Track 27 : GirlDinner\_40
- Track 28 : Superstar\_42

- Track 29 : Andris\_38
- Track 30 : Pablito\_38
- Track 31 : Triumph\_40
- Track 32 : Puginator\_44
- Track 33 : Omar\_41
- Track 34 : Amethyst\_38
- Track 35 : Alvy\_41
- Track 36 : Hank144\_40
- Track 37 : Provolone\_40, Alsaber\_40, Amela\_39, Conan\_42, Vanseggelen\_44, Celery\_42, Verse\_39
- Track 38 : Dexers\_38
- Track 39 : Verabelle\_42
- Track 40 : BroPlease\_39, GreenWeasel\_40
- Track 41 : phiHau3\_40
- Track 42 : Celia\_40, Urza\_40, VieEnRose\_39, Itza\_40

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

The start number called the most often in the published annotations is 17, it was called in 43 of the 92 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Asten\_38, BarryBee\_41, BeardedLady\_39, Bovely\_38, BryanRecycles\_39, Caliburn\_38, Chucky\_38, Dwayne\_38, Eddasa\_39, Ejemplo\_37, Emaanora\_41, EnochSoames\_41, Esperer\_38, Hippo\_38, Hydra\_40, Indigo\_37, Izzy\_39, Jash\_39, Katalie\_38, Lannister\_40, Legacy\_38, Leviticus\_38, Lorelei\_39, Maneekul\_38, Nabi\_39, Nanodon\_40, Nerdos\_37, Oliynyk\_39, OzzyJ\_39, Phettuccine\_38, Rana\_39, RedBear\_39, Rusticus\_39, SarahRose\_38, Snorlax\_38, South40\_38, SunsetPointe\_38, TagePhighter\_40, Triste\_38, TuanPN\_37, Unstoppable\_38, Werner\_38, Whatever\_38, Yasdnil\_38,

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

- Ozzie\_38,

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

- Alsaber\_40, Alvy\_41, Amela\_39, Amethyst\_38, Andris\_38, Animus\_38, BartholomewSD\_41, Bowden\_39, Brataylor\_41, BroPlease\_39, Caelum\_40, Celery\_42, Celeste\_39, Celia\_40, Conan\_42, Danzina\_40, Datran\_40, Daudau\_39, Dexers\_38, Diane\_38, ELB20\_37, GirlDinner\_40, Goby\_38, Godpower\_39, GreenWeasel\_40, Haizum\_40, Hank144\_40, Issmi\_40, Itza\_40, Janus\_39, Jevington\_42, Lika\_38, Loofah\_39, Marav\_42, Nishikigoi\_40, Omar\_41, Pablito\_38, Paedore\_38, Paolo\_43, Provolone\_40, Puginator\_44, R4\_39, SqueakyClean\_38, Sujidade\_39, Superstar\_42, Tefunt\_40, Thestral\_40, TinaBelcher\_39, Toma\_38, Triumph\_40, TrvxScott\_38, Urza\_40, Vanseggelen\_44, Verabelle\_42, Verse\_39, VieEnRose\_39, Zainub\_45, Zemlya\_40, phiHau3\_40,

**Summary by start number:**

Start 14:

- Found in 4 of 104 ( 3.8% ) of genes in pham

- Manual Annotations of this start: 1 of 92
- Called 25.0% of time when present
- Phage (with cluster) where this start called: ELB20\_37 (BD2),

#### Start 16:

- Found in 10 of 104 ( 9.6% ) of genes in pham
- Manual Annotations of this start: 8 of 92
- Called 80.0% of time when present
- Phage (with cluster) where this start called: Brataylor\_41 (BD1), Celeste\_39 (BD1), Danzina\_40 (BD1), Dattran\_40 (BD1), Goby\_38 (BD1), Godpower\_39 (BD1), Sujidade\_39 (BD1), Toma\_38 (BD1),

#### Start 17:

- Found in 45 of 104 ( 43.3% ) of genes in pham
- Manual Annotations of this start: 43 of 92
- Called 97.8% of time when present
- Phage (with cluster) where this start called: Asten\_38 (BD1), BarryBee\_41 (BD1), BeardedLady\_39 (BD1), Bovely\_38 (BD1), BryanRecycles\_39 (BD1), Caliburn\_38 (BD1), Chucky\_38 (BD1), Dwayne\_38 (BD1), Eddasa\_39 (BD1), Ejemplo\_37 (BD1), Emaanora\_41 (BD1), EnochSoames\_41 (BD1), Esperer\_38 (BD1), Hippo\_38 (BD1), Hydra\_40 (BD1), Indigo\_37 (BD1), Izzy\_39 (BD1), Jash\_39 (BD1), Katalie\_38 (BD1), Lannister\_40 (BD1), Legacy\_38 (BD1), Leviticus\_38 (BD1), Lorelei\_39 (BD1), Maneekul\_38 (BD1), Nabi\_39 (BD1), Nanodon\_40 (BD1), Nerdos\_37 (BD1), Oliynyk\_39 (BD1), OzzyJ\_39 (BD1), Phettuccine\_38 (BD1), Rana\_39 (BD1), RedBear\_39 (BD1), Rusticus\_39 (BD1), SarahRose\_38 (BD1), Snorlax\_38 (BD1), South40\_38 (BD1), SunsetPointe\_38 (BD1), TagePhighter\_40 (BD1), Triste\_38 (BD1), TuanPN\_37 (BD1), Unstoppable\_38 (BD1), Werner\_38 (BD1), Whatever\_38 (BD1), Yasdnii\_38 (BD1),

#### Start 18:

- Found in 13 of 104 ( 12.5% ) of genes in pham
- Manual Annotations of this start: 9 of 92
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Alsaber\_40 (BD3), Amela\_39 (BD3), Celery\_42 (BD3), Celia\_40 (BD6), Conan\_42 (BD3), Dexers\_38 (BD3), Itza\_40 (BD6), Provolone\_40 (BD3), Urza\_40 (BD6), Vanseggelen\_44 (BD3), Verabelle\_42 (BD3), Verse\_39 (BD3), VieEnRose\_39 (BD6),

#### Start 19:

- Found in 34 of 104 ( 32.7% ) of genes in pham
- Manual Annotations of this start: 2 of 92
- Called 5.9% of time when present
- Phage (with cluster) where this start called: Lika\_38 (BD1), Zemlya\_40 (BD1),

#### Start 21:

- Found in 1 of 104 ( 1.0% ) of genes in pham
- Manual Annotations of this start: 1 of 92
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Diane\_38 (BD2),

#### Start 22:

- Found in 36 of 104 ( 34.6% ) of genes in pham
- Manual Annotations of this start: 24 of 92

- Called 83.3% of time when present
- Phage (with cluster) where this start called: Alvy\_41 (BD2), Amethyst\_38 (BD2), Andris\_38 (BD2), BartholomewSD\_41 (BD2), Bowden\_39 (BD2), BroPlease\_39 (BD4), Caelum\_40 (BD2), Daudau\_39 (BD2), GreenWeasel\_40 (BD4), Haizum\_40 (BD2), Hank144\_40 (BD2), Issmi\_40 (BD2), Jevington\_42 (BD2), Loofah\_39 (BD2), Marav\_42 (BD2), Nishikigoi\_40 (BD2), Omar\_41 (BD2), Pablito\_38 (BD2), Paedore\_38 (BD2), Paolo\_43 (BD2), Puginator\_44 (BD2), R4\_39 (BD2), Superstar\_42 (BD2), Tefunt\_40 (BD2), Thestral\_40 (BD2), TinaBelcher\_39 (BD2), Triumph\_40 (BD2), TrvxScott\_38 (BD2), Zainub\_45 (BD2), phiHau3\_40 (BD4),

#### Start 23:

- Found in 4 of 104 ( 3.8% ) of genes in pham
- Manual Annotations of this start: 3 of 92
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Animus\_38 (BD2), GirlDinner\_40 (BD2), Janus\_39 (BD2), SqueakyClean\_38 (BD2),

#### Start 24:

- Found in 13 of 104 ( 12.5% ) of genes in pham
- Manual Annotations of this start: 1 of 92
- Called 7.7% of time when present
- Phage (with cluster) where this start called: Ozzie\_38 (BD1),

### **Summary by clusters:**

There are 5 clusters represented in this pham: BD4, BD6, BD1, BD3, BD2,

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

- Start number 16 was manually annotated 8 times for cluster BD1.
- Start number 17 was manually annotated 43 times for cluster BD1.
- Start number 19 was manually annotated 2 times for cluster BD1.
- Start number 24 was manually annotated 1 time for cluster BD1.

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

- Start number 14 was manually annotated 1 time for cluster BD2.
- Start number 21 was manually annotated 1 time for cluster BD2.
- Start number 22 was manually annotated 21 times for cluster BD2.
- Start number 23 was manually annotated 3 times for cluster BD2.

#### Info for manual annotations of cluster BD3:

- Start number 18 was manually annotated 5 times for cluster BD3.

#### Info for manual annotations of cluster BD4:

- Start number 22 was manually annotated 3 times for cluster BD4.

#### Info for manual annotations of cluster BD6:

- Start number 18 was manually annotated 4 times for cluster BD6.

### **Gene Information:**

Gene: Alsaber\_40 Start: 29436, Stop: 29873, Start Num: 18

Candidate Starts for Alsaber\_40:

(Start: 18 @29436 has 9 MA's), (25, 29520), (29, 29568), (30, 29607), (32, 29676), (33, 29682), (34, 29685),

Gene: Alvy\_41 Start: 28916, Stop: 29350, Start Num: 22

Candidate Starts for Alvy\_41:

(1, 28610), (4, 28793), (9, 28850), (Start: 22 @28916 has 24 MA's), (26, 28985), (29, 29030), (30, 29069), (32, 29138), (39, 29327),

Gene: Amela\_39 Start: 30243, Stop: 30680, Start Num: 18

Candidate Starts for Amela\_39:

(Start: 18 @30243 has 9 MA's), (25, 30327), (29, 30375), (30, 30414), (32, 30483), (33, 30489), (34, 30492),

Gene: Amethyst\_38 Start: 28284, Stop: 28715, Start Num: 22

Candidate Starts for Amethyst\_38:

(Start: 22 @28284 has 24 MA's), (25, 28350), (26, 28353), (29, 28398), (30, 28437), (32, 28506), (37, 28554), (39, 28692),

Gene: Andris\_38 Start: 28339, Stop: 28776, Start Num: 22

Candidate Starts for Andris\_38:

(Start: 22 @28339 has 24 MA's), (27, 28426), (29, 28456), (30, 28495),

Gene: Animus\_38 Start: 28772, Stop: 29191, Start Num: 23

Candidate Starts for Animus\_38:

(20, 28748), (Start: 22 @28757 has 24 MA's), (Start: 23 @28772 has 3 MA's), (26, 28826), (29, 28871), (30, 28910), (36, 29006), (39, 29168),

Gene: Asten\_38 Start: 27911, Stop: 28345, Start Num: 17

Candidate Starts for Asten\_38:

(Start: 17 @27911 has 43 MA's), (Start: 19 @27926 has 2 MA's), (29, 28040), (33, 28154),

Gene: BarryBee\_41 Start: 27921, Stop: 28355, Start Num: 17

Candidate Starts for BarryBee\_41:

(Start: 17 @27921 has 43 MA's), (Start: 19 @27936 has 2 MA's), (29, 28050), (33, 28164),

Gene: BartholomewSD\_41 Start: 28915, Stop: 29349, Start Num: 22

Candidate Starts for BartholomewSD\_41:

(1, 28609), (4, 28792), (Start: 22 @28915 has 24 MA's), (26, 28984), (29, 29029), (30, 29068), (32, 29137), (39, 29326),

Gene: BeardedLady\_39 Start: 27805, Stop: 28236, Start Num: 17

Candidate Starts for BeardedLady\_39:

(Start: 17 @27805 has 43 MA's), (Start: 24 @27850 has 1 MA's), (29, 27931), (32, 28039), (33, 28045),

Gene: Bovely\_38 Start: 27558, Stop: 27989, Start Num: 17

Candidate Starts for Bovely\_38:

(Start: 17 @27558 has 43 MA's), (Start: 24 @27603 has 1 MA's), (29, 27684), (32, 27792), (33, 27798),

Gene: Bowden\_39 Start: 28831, Stop: 29265, Start Num: 22

Candidate Starts for Bowden\_39:

(4, 28708), (9, 28765), (Start: 22 @28831 has 24 MA's), (26, 28900), (29, 28945), (30, 28984), (32, 29053), (39, 29242),

Gene: Brataylor\_41 Start: 28894, Stop: 29328, Start Num: 16

Candidate Starts for Brataylor\_41:

(11, 28867), (Start: 16 @28894 has 8 MA's), (Start: 19 @28909 has 2 MA's), (28, 28996), (29, 29023), (32, 29131), (33, 29137),

Gene: BroPlease\_39 Start: 28051, Stop: 28470, Start Num: 22

Candidate Starts for BroPlease\_39:

(Start: 22 @28051 has 24 MA's), (25, 28117), (26, 28120), (27, 28135), (29, 28165), (30, 28204), (32, 28273), (33, 28279), (34, 28282), (38, 28405),

Gene: BryanRecycles\_39 Start: 27909, Stop: 28343, Start Num: 17

Candidate Starts for BryanRecycles\_39:

(Start: 17 @27909 has 43 MA's), (29, 28038), (32, 28146), (33, 28152),

Gene: Caelum\_40 Start: 28531, Stop: 28962, Start Num: 22

Candidate Starts for Caelum\_40:

(1, 28231), (Start: 22 @28531 has 24 MA's), (26, 28600), (27, 28615), (29, 28645), (35, 28774), (39, 28939),

Gene: Caliburn\_38 Start: 27535, Stop: 27966, Start Num: 17

Candidate Starts for Caliburn\_38:

(Start: 17 @27535 has 43 MA's), (Start: 24 @27580 has 1 MA's), (29, 27661), (32, 27769), (33, 27775),

Gene: Celery\_42 Start: 29369, Stop: 29806, Start Num: 18

Candidate Starts for Celery\_42:

(Start: 18 @29369 has 9 MA's), (25, 29453), (29, 29501), (30, 29540), (32, 29609), (33, 29615), (34, 29618),

Gene: Celeste\_39 Start: 28363, Stop: 28797, Start Num: 16

Candidate Starts for Celeste\_39:

(11, 28336), (Start: 16 @28363 has 8 MA's), (Start: 19 @28378 has 2 MA's), (28, 28465), (29, 28492), (32, 28600), (33, 28606),

Gene: Celia\_40 Start: 28458, Stop: 28898, Start Num: 18

Candidate Starts for Celia\_40:

(5, 28347), (6, 28359), (Start: 18 @28458 has 9 MA's), (27, 28563), (29, 28593), (30, 28632), (33, 28707),

Gene: Chucky\_38 Start: 27925, Stop: 28359, Start Num: 17

Candidate Starts for Chucky\_38:

(Start: 17 @27925 has 43 MA's), (Start: 19 @27940 has 2 MA's), (29, 28054), (33, 28168),

Gene: Conan\_42 Start: 29330, Stop: 29767, Start Num: 18

Candidate Starts for Conan\_42:

(Start: 18 @29330 has 9 MA's), (25, 29414), (29, 29462), (30, 29501), (32, 29570), (33, 29576), (34, 29579),

Gene: Danzina\_40 Start: 28664, Stop: 29098, Start Num: 16

Candidate Starts for Danzina\_40:

(11, 28637), (Start: 16 @28664 has 8 MA's), (Start: 19 @28679 has 2 MA's), (28, 28766), (29, 28793), (32, 28901), (33, 28907),

Gene: Dattran\_40 Start: 28470, Stop: 28904, Start Num: 16

Candidate Starts for Dattran\_40:

(11, 28443), (Start: 16 @28470 has 8 MA's), (Start: 19 @28485 has 2 MA's), (28, 28572), (29, 28599), (32, 28707), (33, 28713),

Gene: Daudau\_39 Start: 28676, Stop: 29107, Start Num: 22

Candidate Starts for Daudau\_39:

(Start: 22 @28676 has 24 MA's), (26, 28745), (27, 28760), (29, 28790), (30, 28829), (39, 29084),

Gene: Dexers\_38 Start: 29354, Stop: 29791, Start Num: 18

Candidate Starts for Dexers\_38:

(Start: 18 @29354 has 9 MA's), (25, 29438), (29, 29486), (30, 29525), (32, 29594), (33, 29600), (34, 29603),

Gene: Diane\_38 Start: 28510, Stop: 28944, Start Num: 21

Candidate Starts for Diane\_38:

(Start: 21 @28510 has 1 MA's), (Start: 22 @28513 has 24 MA's), (25, 28579), (26, 28582), (27, 28597), (29, 28627), (30, 28666), (32, 28735), (39, 28921),

Gene: Dwayne\_38 Start: 27912, Stop: 28346, Start Num: 17

Candidate Starts for Dwayne\_38:

(Start: 17 @27912 has 43 MA's), (Start: 19 @27927 has 2 MA's), (29, 28041), (33, 28155),

Gene: ELB20\_37 Start: 28907, Stop: 29350, Start Num: 14

Candidate Starts for ELB20\_37:

(Start: 14 @28907 has 1 MA's), (Start: 22 @28916 has 24 MA's), (26, 28985), (29, 29030), (30, 29069), (35, 29159), (39, 29324),

Gene: Eddasa\_39 Start: 27909, Stop: 28343, Start Num: 17

Candidate Starts for Eddasa\_39:

(Start: 17 @27909 has 43 MA's), (29, 28038), (32, 28146), (33, 28152),

Gene: Ejemplo\_37 Start: 27859, Stop: 28290, Start Num: 17

Candidate Starts for Ejemplo\_37:

(10, 27805), (15, 27847), (Start: 17 @27859 has 43 MA's), (Start: 19 @27874 has 2 MA's), (29, 27985), (33, 28099),

Gene: Emaanora\_41 Start: 27870, Stop: 28304, Start Num: 17

Candidate Starts for Emaanora\_41:

(Start: 17 @27870 has 43 MA's), (Start: 19 @27885 has 2 MA's), (29, 27999), (33, 28113),

Gene: EnochSoames\_41 Start: 27904, Stop: 28338, Start Num: 17

Candidate Starts for EnochSoames\_41:

(Start: 17 @27904 has 43 MA's), (29, 28033), (32, 28141), (33, 28147),

Gene: Esperer\_38 Start: 27371, Stop: 27802, Start Num: 17

Candidate Starts for Esperer\_38:

(Start: 17 @27371 has 43 MA's), (Start: 24 @27416 has 1 MA's), (29, 27497), (32, 27605), (33, 27611),



Gene: GirlDinner\_40 Start: 28273, Stop: 28692, Start Num: 23

Candidate Starts for GirlDinner\_40:

(20, 28249), (Start: 22 @28258 has 24 MA's), (Start: 23 @28273 has 3 MA's), (26, 28327), (29, 28372), (30, 28411), (36, 28507), (39, 28669),

Gene: Goby\_38 Start: 28369, Stop: 28803, Start Num: 16

Candidate Starts for Goby\_38:

(11, 28342), (13, 28351), (Start: 16 @28369 has 8 MA's), (Start: 19 @28384 has 2 MA's), (28, 28471), (29, 28498), (32, 28606), (33, 28612),

Gene: Godpower\_39 Start: 28364, Stop: 28798, Start Num: 16

Candidate Starts for Godpower\_39:

(11, 28337), (12, 28340), (13, 28346), (Start: 16 @28364 has 8 MA's), (Start: 19 @28379 has 2 MA's), (28, 28466), (29, 28493), (32, 28601), (33, 28607),

Gene: GreenWeasel\_40 Start: 28058, Stop: 28477, Start Num: 22

Candidate Starts for GreenWeasel\_40:

(Start: 22 @28058 has 24 MA's), (25, 28124), (26, 28127), (27, 28142), (29, 28172), (30, 28211), (32, 28280), (33, 28286), (34, 28289), (38, 28412),

Gene: Haizum\_40 Start: 28628, Stop: 29059, Start Num: 22

Candidate Starts for Haizum\_40:

(Start: 22 @28628 has 24 MA's), (25, 28694), (26, 28697), (27, 28712), (29, 28742), (30, 28781), (32, 28850), (39, 29036),

Gene: Hank144\_40 Start: 28621, Stop: 29055, Start Num: 22

Candidate Starts for Hank144\_40:

(Start: 22 @28621 has 24 MA's), (26, 28690), (29, 28735), (30, 28774), (36, 28870), (39, 29032),

Gene: Hippo\_38 Start: 27924, Stop: 28358, Start Num: 17

Candidate Starts for Hippo\_38:

(2, 27711), (10, 27870), (15, 27912), (Start: 17 @27924 has 43 MA's), (Start: 19 @27939 has 2 MA's), (29, 28053), (33, 28167),

Gene: Hydra\_40 Start: 28083, Stop: 28514, Start Num: 17

Candidate Starts for Hydra\_40:

(Start: 17 @28083 has 43 MA's), (Start: 24 @28128 has 1 MA's), (29, 28209), (32, 28317), (33, 28323),

Gene: Indigo\_37 Start: 27551, Stop: 27982, Start Num: 17

Candidate Starts for Indigo\_37:

(Start: 17 @27551 has 43 MA's), (Start: 24 @27596 has 1 MA's), (29, 27677), (32, 27785), (33, 27791),

Gene: Issmi\_40 Start: 29225, Stop: 29659, Start Num: 22

Candidate Starts for Issmi\_40:

(Start: 22 @29225 has 24 MA's), (26, 29294), (29, 29339), (30, 29378), (39, 29636),

Gene: Itza\_40 Start: 28372, Stop: 28812, Start Num: 18

Candidate Starts for Itza\_40:

(5, 28261), (6, 28273), (Start: 18 @28372 has 9 MA's), (27, 28477), (29, 28507), (30, 28546), (33, 28621),

Gene: Izzy\_39 Start: 27956, Stop: 28390, Start Num: 17  
Candidate Starts for Izzy\_39:  
(Start: 17 @27956 has 43 MA's), (29, 28085), (32, 28193), (33, 28199),

Gene: Janus\_39 Start: 28613, Stop: 29032, Start Num: 23  
Candidate Starts for Janus\_39:  
(20, 28589), (Start: 22 @28598 has 24 MA's), (Start: 23 @28613 has 3 MA's), (26, 28667), (29, 28712), (30, 28751), (36, 28847), (39, 29009),

Gene: Jash\_39 Start: 27909, Stop: 28343, Start Num: 17  
Candidate Starts for Jash\_39:  
(Start: 17 @27909 has 43 MA's), (29, 28038), (32, 28146), (33, 28152),

Gene: Jevington\_42 Start: 29016, Stop: 29450, Start Num: 22  
Candidate Starts for Jevington\_42:  
(1, 28713), (6, 28917), (Start: 22 @29016 has 24 MA's), (26, 29085), (29, 29130), (30, 29169), (39, 29427),

Gene: Katalie\_38 Start: 28095, Stop: 28529, Start Num: 17  
Candidate Starts for Katalie\_38:  
(2, 27885), (3, 27924), (10, 28041), (15, 28083), (Start: 17 @28095 has 43 MA's), (Start: 19 @28110 has 2 MA's), (29, 28224), (32, 28332), (33, 28338),

Gene: Lannister\_40 Start: 28575, Stop: 29006, Start Num: 17  
Candidate Starts for Lannister\_40:  
(10, 28521), (15, 28563), (Start: 17 @28575 has 43 MA's), (Start: 19 @28590 has 2 MA's), (29, 28701), (32, 28809), (33, 28815),

Gene: Legacy\_38 Start: 27526, Stop: 27957, Start Num: 17  
Candidate Starts for Legacy\_38:  
(Start: 17 @27526 has 43 MA's), (Start: 24 @27571 has 1 MA's), (29, 27652), (32, 27760), (33, 27766),

Gene: Leviticus\_38 Start: 27555, Stop: 27986, Start Num: 17  
Candidate Starts for Leviticus\_38:  
(Start: 17 @27555 has 43 MA's), (Start: 24 @27600 has 1 MA's), (29, 27681), (32, 27789), (33, 27795),

Gene: Lika\_38 Start: 28382, Stop: 28801, Start Num: 19  
Candidate Starts for Lika\_38:  
(11, 28340), (13, 28349), (Start: 16 @28367 has 8 MA's), (Start: 19 @28382 has 2 MA's), (28, 28469), (29, 28496), (32, 28604), (33, 28610),

Gene: Loofah\_39 Start: 28786, Stop: 29220, Start Num: 22  
Candidate Starts for Loofah\_39:  
(Start: 14 @28777 has 1 MA's), (Start: 22 @28786 has 24 MA's), (26, 28855), (29, 28900), (30, 28939), (35, 29029), (39, 29194),

Gene: Lorelei\_39 Start: 28430, Stop: 28861, Start Num: 17  
Candidate Starts for Lorelei\_39:  
(2, 28217), (7, 28343), (Start: 17 @28430 has 43 MA's), (Start: 19 @28445 has 2 MA's), (29, 28556), (32, 28664), (33, 28670),

Gene: Maneekul\_38 Start: 27949, Stop: 28380, Start Num: 17

Candidate Starts for Maneekul\_38:

(10, 27895), (15, 27937), (Start: 17 @27949 has 43 MA's), (Start: 19 @27964 has 2 MA's), (29, 28075), (33, 28189),

Gene: Marav\_42 Start: 29341, Stop: 29775, Start Num: 22

Candidate Starts for Marav\_42:

(1, 29038), (6, 29242), (Start: 22 @29341 has 24 MA's), (26, 29410), (29, 29455), (30, 29494), (39, 29752),

Gene: Nabi\_39 Start: 28430, Stop: 28861, Start Num: 17

Candidate Starts for Nabi\_39:

(2, 28217), (7, 28343), (Start: 17 @28430 has 43 MA's), (Start: 19 @28445 has 2 MA's), (29, 28556), (32, 28664), (33, 28670),

Gene: Nanodon\_40 Start: 28195, Stop: 28632, Start Num: 17

Candidate Starts for Nanodon\_40:

(Start: 17 @28195 has 43 MA's), (29, 28327), (32, 28435), (33, 28441),

Gene: Nerdos\_37 Start: 27550, Stop: 27981, Start Num: 17

Candidate Starts for Nerdos\_37:

(Start: 17 @27550 has 43 MA's), (Start: 24 @27595 has 1 MA's), (29, 27676), (32, 27784), (33, 27790),

Gene: Nishikigoi\_40 Start: 28628, Stop: 29059, Start Num: 22

Candidate Starts for Nishikigoi\_40:

(Start: 22 @28628 has 24 MA's), (25, 28694), (26, 28697), (27, 28712), (29, 28742), (30, 28781), (32, 28850), (39, 29036),

Gene: Oliynyk\_39 Start: 27909, Stop: 28343, Start Num: 17

Candidate Starts for Oliynyk\_39:

(Start: 17 @27909 has 43 MA's), (29, 28038), (32, 28146), (33, 28152),

Gene: Omar\_41 Start: 28853, Stop: 29287, Start Num: 22

Candidate Starts for Omar\_41:

(Start: 22 @28853 has 24 MA's), (26, 28922), (29, 28967), (30, 29006), (39, 29264),

Gene: Ozzie\_38 Start: 27580, Stop: 27966, Start Num: 24

Candidate Starts for Ozzie\_38:

(Start: 17 @27535 has 43 MA's), (Start: 24 @27580 has 1 MA's), (29, 27661), (32, 27769), (33, 27775),

Gene: OzzyJ\_39 Start: 27912, Stop: 28346, Start Num: 17

Candidate Starts for OzzyJ\_39:

(Start: 17 @27912 has 43 MA's), (Start: 19 @27927 has 2 MA's), (29, 28041), (33, 28155),

Gene: Pablito\_38 Start: 28161, Stop: 28598, Start Num: 22

Candidate Starts for Pablito\_38:

(Start: 22 @28161 has 24 MA's), (26, 28230), (27, 28245), (29, 28275), (30, 28314), (31, 28338), (36, 28410), (39, 28575),

Gene: Paedore\_38 Start: 28771, Stop: 29205, Start Num: 22

Candidate Starts for Paedore\_38:

(Start: 14 @28762 has 1 MA's), (Start: 22 @28771 has 24 MA's), (26, 28840), (29, 28885), (30, 28924), (35, 29014), (39, 29179),

Gene: Paolo\_43 Start: 29198, Stop: 29632, Start Num: 22

Candidate Starts for Paolo\_43:

(Start: 22 @29198 has 24 MA's), (26, 29267), (29, 29312), (39, 29609),

Gene: Phettuccine\_38 Start: 27551, Stop: 27982, Start Num: 17

Candidate Starts for Phettuccine\_38:

(Start: 17 @27551 has 43 MA's), (Start: 24 @27596 has 1 MA's), (29, 27677), (32, 27785), (33, 27791),

Gene: Provolone\_40 Start: 28985, Stop: 29422, Start Num: 18

Candidate Starts for Provolone\_40:

(Start: 18 @28985 has 9 MA's), (25, 29069), (29, 29117), (30, 29156), (32, 29225), (33, 29231), (34, 29234),

Gene: Puginator\_44 Start: 29219, Stop: 29653, Start Num: 22

Candidate Starts for Puginator\_44:

(1, 28913), (4, 29096), (9, 29153), (Start: 22 @29219 has 24 MA's), (26, 29288), (29, 29333), (39, 29630),

Gene: R4\_39 Start: 28926, Stop: 29360, Start Num: 22

Candidate Starts for R4\_39:

(Start: 14 @28917 has 1 MA's), (Start: 22 @28926 has 24 MA's), (26, 28995), (29, 29040), (30, 29079), (35, 29169), (39, 29334),

Gene: Rana\_39 Start: 28430, Stop: 28861, Start Num: 17

Candidate Starts for Rana\_39:

(2, 28217), (7, 28343), (Start: 17 @28430 has 43 MA's), (Start: 19 @28445 has 2 MA's), (29, 28556), (32, 28664), (33, 28670),

Gene: RedBear\_39 Start: 28095, Stop: 28529, Start Num: 17

Candidate Starts for RedBear\_39:

(2, 27885), (3, 27924), (10, 28041), (15, 28083), (Start: 17 @28095 has 43 MA's), (Start: 19 @28110 has 2 MA's), (29, 28224), (32, 28332), (33, 28338),

Gene: Rusticus\_39 Start: 27909, Stop: 28343, Start Num: 17

Candidate Starts for Rusticus\_39:

(Start: 17 @27909 has 43 MA's), (29, 28038), (32, 28146), (33, 28152),

Gene: SarahRose\_38 Start: 27920, Stop: 28354, Start Num: 17

Candidate Starts for SarahRose\_38:

(Start: 17 @27920 has 43 MA's), (Start: 19 @27935 has 2 MA's), (29, 28049), (33, 28163),

Gene: Snorlax\_38 Start: 27924, Stop: 28358, Start Num: 17

Candidate Starts for Snorlax\_38:

(Start: 17 @27924 has 43 MA's), (Start: 19 @27939 has 2 MA's), (29, 28053), (33, 28167),

Gene: South40\_38 Start: 28095, Stop: 28529, Start Num: 17

Candidate Starts for South40\_38:

(2, 27885), (3, 27924), (10, 28041), (15, 28083), (Start: 17 @28095 has 43 MA's), (Start: 19 @28110 has 2 MA's), (29, 28224), (32, 28332), (33, 28338),

Gene: SqueakyClean\_38 Start: 28704, Stop: 29123, Start Num: 23

Candidate Starts for SqueakyClean\_38:

(20, 28680), (Start: 22 @28689 has 24 MA's), (Start: 23 @28704 has 3 MA's), (26, 28758), (29, 28803), (30, 28842), (36, 28938), (39, 29100),

Gene: Sujidade\_39 Start: 28652, Stop: 29086, Start Num: 16

Candidate Starts for Sujidade\_39:

(11, 28625), (13, 28634), (Start: 16 @28652 has 8 MA's), (Start: 19 @28667 has 2 MA's), (28, 28754), (29, 28781), (32, 28889), (33, 28895),

Gene: SunsetPointe\_38 Start: 27542, Stop: 27973, Start Num: 17

Candidate Starts for SunsetPointe\_38:

(Start: 17 @27542 has 43 MA's), (Start: 24 @27587 has 1 MA's), (29, 27668), (32, 27776), (33, 27782),

Gene: Superstar\_42 Start: 29737, Stop: 30168, Start Num: 22

Candidate Starts for Superstar\_42:

(Start: 22 @29737 has 24 MA's), (26, 29806), (29, 29851), (35, 29980), (39, 30145),

Gene: TagePhighter\_40 Start: 27924, Stop: 28358, Start Num: 17

Candidate Starts for TagePhighter\_40:

(Start: 17 @27924 has 43 MA's), (Start: 19 @27939 has 2 MA's), (29, 28053), (33, 28167),

Gene: Tefunt\_40 Start: 28630, Stop: 29061, Start Num: 22

Candidate Starts for Tefunt\_40:

(Start: 22 @28630 has 24 MA's), (25, 28696), (26, 28699), (27, 28714), (29, 28744), (30, 28783), (32, 28852), (39, 29038),

Gene: Thestral\_40 Start: 28823, Stop: 29257, Start Num: 22

Candidate Starts for Thestral\_40:

(4, 28700), (9, 28757), (Start: 22 @28823 has 24 MA's), (26, 28892), (29, 28937), (30, 28976), (32, 29045), (39, 29234),

Gene: TinaBelcher\_39 Start: 28770, Stop: 29204, Start Num: 22

Candidate Starts for TinaBelcher\_39:

(4, 28647), (9, 28704), (Start: 22 @28770 has 24 MA's), (26, 28839), (29, 28884), (30, 28923), (32, 28992), (39, 29181),

Gene: Toma\_38 Start: 28369, Stop: 28803, Start Num: 16

Candidate Starts for Toma\_38:

(11, 28342), (13, 28351), (Start: 16 @28369 has 8 MA's), (Start: 19 @28384 has 2 MA's), (28, 28471), (29, 28498), (32, 28606), (33, 28612),

Gene: Triste\_38 Start: 27912, Stop: 28346, Start Num: 17

Candidate Starts for Triste\_38:

(Start: 17 @27912 has 43 MA's), (Start: 19 @27927 has 2 MA's), (29, 28041), (33, 28155),

Gene: Triumph\_40 Start: 28519, Stop: 28953, Start Num: 22

Candidate Starts for Triumph\_40:

(6, 28423), (Start: 22 @28519 has 24 MA's), (26, 28588), (29, 28633), (30, 28672), (36, 28768), (39, 28930),

Gene: TrvxScott\_38 Start: 28816, Stop: 29250, Start Num: 22

Candidate Starts for TrvxScott\_38:

(4, 28693), (9, 28750), (Start: 22 @28816 has 24 MA's), (26, 28885), (29, 28930), (30, 28969), (32, 29038), (39, 29227),

Gene: TuanPN\_37 Start: 27859, Stop: 28290, Start Num: 17

Candidate Starts for TuanPN\_37:

(10, 27805), (15, 27847), (Start: 17 @27859 has 43 MA's), (Start: 19 @27874 has 2 MA's), (29, 27985), (33, 28099),

Gene: Unstoppable\_38 Start: 27546, Stop: 27977, Start Num: 17

Candidate Starts for Unstoppable\_38:

(Start: 17 @27546 has 43 MA's), (Start: 24 @27591 has 1 MA's), (29, 27672), (32, 27780), (33, 27786),

Gene: Urza\_40 Start: 28393, Stop: 28833, Start Num: 18

Candidate Starts for Urza\_40:

(5, 28282), (6, 28294), (Start: 18 @28393 has 9 MA's), (27, 28498), (29, 28528), (30, 28567), (33, 28642),

Gene: Vanseggelen\_44 Start: 29086, Stop: 29523, Start Num: 18

Candidate Starts for Vanseggelen\_44:

(Start: 18 @29086 has 9 MA's), (25, 29170), (29, 29218), (30, 29257), (32, 29326), (33, 29332), (34, 29335),

Gene: Verabelle\_42 Start: 29495, Stop: 29932, Start Num: 18

Candidate Starts for Verabelle\_42:

(Start: 18 @29495 has 9 MA's), (25, 29579), (29, 29627), (30, 29666), (32, 29735), (33, 29741), (34, 29744),

Gene: Verse\_39 Start: 30237, Stop: 30674, Start Num: 18

Candidate Starts for Verse\_39:

(Start: 18 @30237 has 9 MA's), (25, 30321), (29, 30369), (30, 30408), (32, 30477), (33, 30483), (34, 30486),

Gene: VieEnRose\_39 Start: 28317, Stop: 28757, Start Num: 18

Candidate Starts for VieEnRose\_39:

(5, 28206), (6, 28218), (Start: 18 @28317 has 9 MA's), (27, 28422), (29, 28452), (30, 28491), (33, 28566),

Gene: Werner\_38 Start: 27922, Stop: 28356, Start Num: 17

Candidate Starts for Werner\_38:

(Start: 17 @27922 has 43 MA's), (Start: 19 @27937 has 2 MA's), (29, 28051), (33, 28165),

Gene: Whatever\_38 Start: 27922, Stop: 28356, Start Num: 17

Candidate Starts for Whatever\_38:

(Start: 17 @27922 has 43 MA's), (Start: 19 @27937 has 2 MA's), (29, 28051), (33, 28165),

Gene: Yasdnii\_38 Start: 27977, Stop: 28408, Start Num: 17

Candidate Starts for Yasdnii\_38:

(10, 27923), (15, 27965), (Start: 17 @27977 has 43 MA's), (Start: 19 @27992 has 2 MA's), (29, 28103), (33, 28217),

Gene: Zainub\_45 Start: 29159, Stop: 29593, Start Num: 22  
Candidate Starts for Zainub\_45:  
(Start: 22 @29159 has 24 MA's), (26, 29228), (29, 29273), (39, 29570),

Gene: Zemlya\_40 Start: 28485, Stop: 28904, Start Num: 19  
Candidate Starts for Zemlya\_40:  
(11, 28443), (Start: 16 @28470 has 8 MA's), (Start: 19 @28485 has 2 MA's), (28, 28572), (29, 28599),  
(32, 28707), (33, 28713),

Gene: phiHau3\_40 Start: 28023, Stop: 28442, Start Num: 22  
Candidate Starts for phiHau3\_40:  
(8, 27927), (Start: 22 @28023 has 24 MA's), (25, 28089), (26, 28092), (27, 28107), (29, 28137), (30,  
28176), (32, 28245), (33, 28251), (34, 28254), (38, 28377),