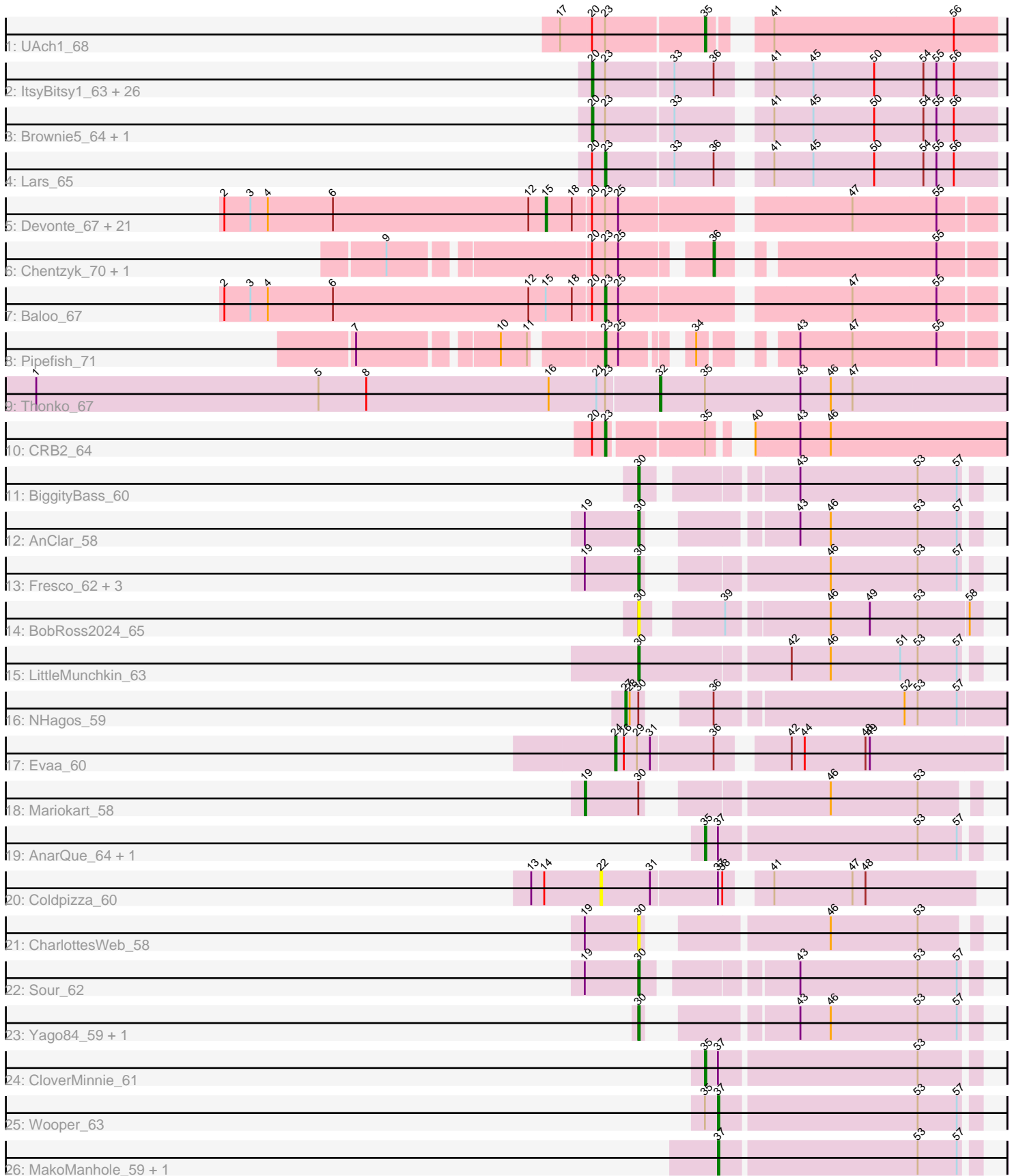


Pham 202880



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 202880 Report

This analysis was run 01/18/25 on database version 583.

Pham number 202880 has 81 members, 7 are drafts.

Phages represented in each track:

- Track 1 : UAch1\_68
- Track 2 : ItsyBitsy1\_63, Calamitous\_65, Glass\_65, Eaglehorse\_64, Qyrzula\_58, Boyle\_64, FrenchFry\_65, LizLemon\_64, Arbiter\_62, Kheth\_64, Bananafish\_65, Kolhan\_65, Sabella\_64, Rhinoforte\_64, MasterPo\_65, Godines\_65, Ares\_64, Lephleur\_64, Opia\_65, Laurie\_64, Rosebush\_63, Tres\_64, LilSmirk\_64, Holeinone\_64, Hedgerow\_64, West99\_64, Blocker23\_64
- Track 3 : Brownie5\_64, Tinciduntolum\_65
- Track 4 : Lars\_65
- Track 5 : Devonte\_67, Gadget\_69, Athena\_70, Heathcliff\_68, SynergyX\_68, GlenHope\_69, Yinz\_68, Casbah\_68, Corofin\_68, Phlyer\_68, Halfpint\_67, RagingRooster\_67, Jackstina\_64, OrangeOswald\_68, Nozo\_68, RomaT\_68, Abinghost\_68, Philly\_67, Audrey\_68, Rita1961\_69, Deenasa\_68, ChaChing\_68
- Track 6 : Chentzyk\_70, Morty007\_67
- Track 7 : Baloo\_67
- Track 8 : Pipefish\_71
- Track 9 : Thonko\_67
- Track 10 : CRB2\_64
- Track 11 : BiggityBass\_60
- Track 12 : AnClar\_58
- Track 13 : Fresco\_62, Ligma\_62, Shatter\_62, Axumite\_62
- Track 14 : BobRoss2024\_65
- Track 15 : LittleMunchkin\_63
- Track 16 : NHagos\_59
- Track 17 : Evaa\_60
- Track 18 : Mariokart\_58
- Track 19 : AnarQue\_64, Yeshua\_63
- Track 20 : Coldpizza\_60
- Track 21 : CharlottesWeb\_58
- Track 22 : Sour\_62
- Track 23 : Yago84\_59, Sisko\_60
- Track 24 : CloverMinnie\_61
- Track 25 : Wooper\_63
- Track 26 : MakoManhole\_59, CaiB\_62

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

The start number called the most often in the published annotations is 20, it was called in 27 of the 74 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Arbiter\_62, Ares\_64, Bananafish\_65, Blocker23\_64, Boyle\_64, Brownie5\_64, Calamitous\_65, Eaglehorse\_64, FrenchFry\_65, Glass\_65, Godines\_65, Hedgerow\_64, Holeinone\_64, ItsyBitsy1\_63, Kheth\_64, Kolhan\_65, Laurie\_64, Lephleur\_64, LilSmirk\_64, LizLemon\_64, MasterPo\_65, Opia\_65, Qyrzula\_58, Rhinoforte\_64, Rosebush\_63, Sabella\_64, Tinciduntolum\_65, Tres\_64, West99\_64,

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

- Abinghost\_68, Athena\_70, Audrey\_68, Baloo\_67, CRB2\_64, Casbah\_68, ChaChing\_68, Chentzyk\_70, Corofin\_68, Deenasa\_68, Devonte\_67, Gadjet\_69, GlenHope\_69, Halfpint\_67, Heathcliff\_68, Jackstina\_64, Lars\_65, Morty007\_67, Nozo\_68, OrangeOswald\_68, Philly\_67, Phlyer\_68, RagingRooster\_67, Rita1961\_69, RomaT\_68, SynergyX\_68, UAch1\_68, Yinz\_68,

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

- AnClar\_58, AnarQue\_64, Axumite\_62, BiggityBass\_60, BobRoss2024\_65, CaiB\_62, CharlottesWeb\_58, CloverMinnie\_61, Coldpizza\_60, Evaa\_60, Fresco\_62, Ligma\_62, LittleMunchkin\_63, MakoManhole\_59, Mariokart\_58, NHagos\_59, Pipefish\_71, Shatter\_62, Sisko\_60, Sour\_62, Thonko\_67, Wooper\_63, Yago84\_59, Yeshua\_63,

### Summary by start number:

Start 15:

- Found in 23 of 81 ( 28.4% ) of genes in pham
- Manual Annotations of this start: 22 of 74
- Called 95.7% of time when present
- Phage (with cluster) where this start called: Abinghost\_68 (B3), Athena\_70 (B3), Audrey\_68 (B3), Casbah\_68 (B3), ChaChing\_68 (B3), Corofin\_68 (B3), Deenasa\_68 (B3), Devonte\_67 (B3), Gadjet\_69 (B3), GlenHope\_69 (B3), Halfpint\_67 (B3), Heathcliff\_68 (B3), Jackstina\_64 (B3), Nozo\_68 (B3), OrangeOswald\_68 (B3), Philly\_67 (B3), Phlyer\_68 (B3), RagingRooster\_67 (B3), Rita1961\_69 (B3), RomaT\_68 (B3), SynergyX\_68 (B3), Yinz\_68 (B3),

Start 19:

- Found in 8 of 81 ( 9.9% ) of genes in pham
- Manual Annotations of this start: 1 of 74
- Called 12.5% of time when present
- Phage (with cluster) where this start called: Mariokart\_58 (DR),

Start 20:

- Found in 57 of 81 ( 70.4% ) of genes in pham
- Manual Annotations of this start: 27 of 74
- Called 50.9% of time when present
- Phage (with cluster) where this start called: Arbiter\_62 (B2), Ares\_64 (B2), Bananafish\_65 (B2), Blocker23\_64 (B2), Boyle\_64 (B2), Brownie5\_64 (B2), Calamitous\_65 (B2), Eaglehorse\_64 (B2), FrenchFry\_65 (B2), Glass\_65 (B2), Godines\_65 (B2), Hedgerow\_64 (B2), Holeinone\_64 (B2), ItsyBitsy1\_63 (B2), Kheth\_64 (B2), Kolhan\_65 (B2), Laurie\_64 (B2), Lephleur\_64 (B2), LilSmirk\_64 (B2), LizLemon\_64 (B2), MasterPo\_65 (B2), Opia\_65 (B2), Qyrzula\_58 (B2), Rhinoforte\_64

(B2), Rosebush\_63 (B2), Sabella\_64 (B2), Tinciduntolum\_65 (B2), Tres\_64 (B2), West99\_64 (B2),

Start 22:

- Found in 1 of 81 ( 1.2% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Coldpizza\_60 (DR),

Start 23:

- Found in 59 of 81 ( 72.8% ) of genes in pham
- Manual Annotations of this start: 4 of 74
- Called 6.8% of time when present
- Phage (with cluster) where this start called: Baloo\_67 (B3), CRB2\_64 (B9), Lars\_65 (B2), Pipefish\_71 (B3),

Start 24:

- Found in 1 of 81 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 1 of 74
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Evaa\_60 (DR),

Start 27:

- Found in 1 of 81 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 1 of 74
- Called 100.0% of time when present
- Phage (with cluster) where this start called: NHagos\_59 (DR),

Start 30:

- Found in 14 of 81 ( 17.3% ) of genes in pham
- Manual Annotations of this start: 10 of 74
- Called 85.7% of time when present
- Phage (with cluster) where this start called: AnClar\_58 (DR), Axumite\_62 (DR), BiggityBass\_60 (DR), BobRoss2024\_65 (DR), CharlottesWeb\_58 (DR), Fresco\_62 (DR), Ligma\_62 (DR), LittleMunchkin\_63 (DR), Shatter\_62 (DR), Sisko\_60 (DR), Sour\_62 (DR), Yago84\_59 (DR),

Start 32:

- Found in 1 of 81 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 1 of 74
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Thonko\_67 (B8),

Start 35:

- Found in 7 of 81 ( 8.6% ) of genes in pham
- Manual Annotations of this start: 3 of 74
- Called 57.1% of time when present
- Phage (with cluster) where this start called: AnarQue\_64 (DR), CloverMinnie\_61 (DR), UAch1\_68 (B1), Yeshua\_63 (DR),

Start 36:

- Found in 32 of 81 ( 39.5% ) of genes in pham
- Manual Annotations of this start: 1 of 74

- Called 6.2% of time when present
- Phage (with cluster) where this start called: Chentzyk\_70 (B3), Morty007\_67 (B3),

Start 37:

- Found in 7 of 81 ( 8.6% ) of genes in pham
- Manual Annotations of this start: 3 of 74
- Called 42.9% of time when present
- Phage (with cluster) where this start called: CaiB\_62 (DR), MakoManhole\_59 (DR), Wooper\_63 (DR),

### **Summary by clusters:**

There are 6 clusters represented in this pham: DR, B1, B2, B3, B8, B9,

Info for manual annotations of cluster B1:

- Start number 35 was manually annotated 1 time for cluster B1.

Info for manual annotations of cluster B2:

- Start number 20 was manually annotated 27 times for cluster B2.
- Start number 23 was manually annotated 1 time for cluster B2.

Info for manual annotations of cluster B3:

- Start number 15 was manually annotated 22 times for cluster B3.
- Start number 23 was manually annotated 2 times for cluster B3.
- Start number 36 was manually annotated 1 time for cluster B3.

Info for manual annotations of cluster B8:

- Start number 32 was manually annotated 1 time for cluster B8.

Info for manual annotations of cluster B9:

- Start number 23 was manually annotated 1 time for cluster B9.

Info for manual annotations of cluster DR:

- Start number 19 was manually annotated 1 time for cluster DR.
- Start number 24 was manually annotated 1 time for cluster DR.
- Start number 27 was manually annotated 1 time for cluster DR.
- Start number 30 was manually annotated 10 times for cluster DR.
- Start number 35 was manually annotated 2 times for cluster DR.
- Start number 37 was manually annotated 3 times for cluster DR.

### **Gene Information:**

Gene: Abinghost\_68 Start: 57207, Stop: 57494, Start Num: 15

Candidate Starts for Abinghost\_68:

(2, 56985), (3, 57003), (4, 57015), (6, 57060), (12, 57195), (Start: 15 @57207 has 22 MA's), (18, 57225), (Start: 20 @57237 has 27 MA's), (Start: 23 @57246 has 4 MA's), (25, 57255), (47, 57399), (55, 57456),

Gene: AnClar\_58 Start: 51779, Stop: 51976, Start Num: 30

Candidate Starts for AnClar\_58:

(Start: 19 @51743 has 1 MA's), (Start: 30 @51779 has 10 MA's), (43, 51857), (46, 51878), (53, 51938), (57, 51965),

Gene: AnarQue\_64 Start: 52219, Stop: 52398, Start Num: 35

Candidate Starts for AnarQue\_64:

(Start: 35 @52219 has 3 MA's), (Start: 37 @52228 has 3 MA's), (53, 52360), (57, 52387),

Gene: Arbiter\_62 Start: 55569, Stop: 55829, Start Num: 20

Candidate Starts for Arbiter\_62:

(Start: 20 @55569 has 27 MA's), (Start: 23 @55578 has 4 MA's), (33, 55623), (Start: 36 @55650 has 1 MA's), (41, 55677), (45, 55704), (50, 55746), (54, 55779), (55, 55788), (56, 55800),

Gene: Ares\_64 Start: 55540, Stop: 55800, Start Num: 20

Candidate Starts for Ares\_64:

(Start: 20 @55540 has 27 MA's), (Start: 23 @55549 has 4 MA's), (33, 55594), (Start: 36 @55621 has 1 MA's), (41, 55648), (45, 55675), (50, 55717), (54, 55750), (55, 55759), (56, 55771),

Gene: Athena\_70 Start: 57982, Stop: 58269, Start Num: 15

Candidate Starts for Athena\_70:

(2, 57760), (3, 57778), (4, 57790), (6, 57835), (12, 57970), (Start: 15 @57982 has 22 MA's), (18, 58000), (Start: 20 @58012 has 27 MA's), (Start: 23 @58021 has 4 MA's), (25, 58030), (47, 58174), (55, 58231),

Gene: Audrey\_68 Start: 57246, Stop: 57533, Start Num: 15

Candidate Starts for Audrey\_68:

(2, 57024), (3, 57042), (4, 57054), (6, 57099), (12, 57234), (Start: 15 @57246 has 22 MA's), (18, 57264), (Start: 20 @57276 has 27 MA's), (Start: 23 @57285 has 4 MA's), (25, 57294), (47, 57438), (55, 57495),

Gene: Axumite\_62 Start: 50626, Stop: 50826, Start Num: 30

Candidate Starts for Axumite\_62:

(Start: 19 @50590 has 1 MA's), (Start: 30 @50626 has 10 MA's), (46, 50728), (53, 50788), (57, 50815),

Gene: Baloo\_67 Start: 57118, Stop: 57366, Start Num: 23

Candidate Starts for Baloo\_67:

(2, 56857), (3, 56875), (4, 56887), (6, 56932), (12, 57067), (Start: 15 @57079 has 22 MA's), (18, 57097), (Start: 20 @57109 has 27 MA's), (Start: 23 @57118 has 4 MA's), (25, 57127), (47, 57271), (55, 57328),

Gene: Bananafish\_65 Start: 55470, Stop: 55730, Start Num: 20

Candidate Starts for Bananafish\_65:

(Start: 20 @55470 has 27 MA's), (Start: 23 @55479 has 4 MA's), (33, 55524), (Start: 36 @55551 has 1 MA's), (41, 55578), (45, 55605), (50, 55647), (54, 55680), (55, 55689), (56, 55701),

Gene: BiggityBass\_60 Start: 52323, Stop: 52532, Start Num: 30

Candidate Starts for BiggityBass\_60:

(Start: 30 @52323 has 10 MA's), (43, 52413), (53, 52494), (57, 52521),

Gene: Blocker23\_64 Start: 55537, Stop: 55797, Start Num: 20

Candidate Starts for Blocker23\_64:

(Start: 20 @55537 has 27 MA's), (Start: 23 @55546 has 4 MA's), (33, 55591), (Start: 36 @55618 has 1 MA's), (41, 55645), (45, 55672), (50, 55714), (54, 55747), (55, 55756), (56, 55768),

Gene: BobRoss2024\_65 Start: 51837, Stop: 52049, Start Num: 30  
Candidate Starts for BobRoss2024\_65:  
(Start: 30 @51837 has 10 MA's), (39, 51882), (46, 51948), (49, 51975), (53, 52008), (58, 52041),

Gene: Boyle\_64 Start: 55578, Stop: 55838, Start Num: 20  
Candidate Starts for Boyle\_64:  
(Start: 20 @55578 has 27 MA's), (Start: 23 @55587 has 4 MA's), (33, 55632), (Start: 36 @55659 has 1 MA's), (41, 55686), (45, 55713), (50, 55755), (54, 55788), (55, 55797), (56, 55809),

Gene: Brownie5\_64 Start: 55580, Stop: 55840, Start Num: 20  
Candidate Starts for Brownie5\_64:  
(Start: 20 @55580 has 27 MA's), (Start: 23 @55589 has 4 MA's), (33, 55634), (41, 55688), (45, 55715), (50, 55757), (54, 55790), (55, 55799), (56, 55811),

Gene: CRB2\_64 Start: 58911, Stop: 59153, Start Num: 23  
Candidate Starts for CRB2\_64:  
(Start: 20 @58902 has 27 MA's), (Start: 23 @58911 has 4 MA's), (Start: 35 @58971 has 3 MA's), (40, 58983), (43, 59013), (46, 59034),

Gene: CaiB\_62 Start: 52012, Stop: 52182, Start Num: 37  
Candidate Starts for CaiB\_62:  
(Start: 37 @52012 has 3 MA's), (53, 52144), (57, 52171),

Gene: Calamitous\_65 Start: 55468, Stop: 55728, Start Num: 20  
Candidate Starts for Calamitous\_65:  
(Start: 20 @55468 has 27 MA's), (Start: 23 @55477 has 4 MA's), (33, 55522), (Start: 36 @55549 has 1 MA's), (41, 55576), (45, 55603), (50, 55645), (54, 55678), (55, 55687), (56, 55699),

Gene: Casbah\_68 Start: 57566, Stop: 57853, Start Num: 15  
Candidate Starts for Casbah\_68:  
(2, 57344), (3, 57362), (4, 57374), (6, 57419), (12, 57554), (Start: 15 @57566 has 22 MA's), (18, 57584), (Start: 20 @57596 has 27 MA's), (Start: 23 @57605 has 4 MA's), (25, 57614), (47, 57758), (55, 57815),

Gene: ChaChing\_68 Start: 57264, Stop: 57551, Start Num: 15  
Candidate Starts for ChaChing\_68:  
(2, 57042), (3, 57060), (4, 57072), (6, 57117), (12, 57252), (Start: 15 @57264 has 22 MA's), (18, 57282), (Start: 20 @57294 has 27 MA's), (Start: 23 @57303 has 4 MA's), (25, 57312), (47, 57456), (55, 57513),

Gene: CharlottesWeb\_58 Start: 49213, Stop: 49410, Start Num: 30  
Candidate Starts for CharlottesWeb\_58:  
(Start: 19 @49177 has 1 MA's), (Start: 30 @49213 has 10 MA's), (46, 49315), (53, 49375),

Gene: Chentzyk\_70 Start: 58320, Stop: 58484, Start Num: 36  
Candidate Starts for Chentzyk\_70:  
(9, 58125), (Start: 20 @58251 has 27 MA's), (Start: 23 @58260 has 4 MA's), (25, 58269), (Start: 36 @58320 has 1 MA's), (55, 58446),

Gene: CloverMinnie\_61 Start: 51166, Stop: 51345, Start Num: 35  
Candidate Starts for CloverMinnie\_61:  
(Start: 35 @51166 has 3 MA's), (Start: 37 @51175 has 3 MA's), (53, 51307),

Gene: Coldpizza\_60 Start: 52390, Stop: 52629, Start Num: 22

Candidate Starts for Coldpizza\_60:

(13, 52342), (14, 52351), (22, 52390), (31, 52423), (Start: 37 @52468 has 3 MA's), (38, 52471), (41, 52492), (47, 52546), (48, 52555),

Gene: Corofin\_68 Start: 57277, Stop: 57564, Start Num: 15

Candidate Starts for Corofin\_68:

(2, 57055), (3, 57073), (4, 57085), (6, 57130), (12, 57265), (Start: 15 @57277 has 22 MA's), (18, 57295), (Start: 20 @57307 has 27 MA's), (Start: 23 @57316 has 4 MA's), (25, 57325), (47, 57469), (55, 57526),

Gene: Deenasa\_68 Start: 58113, Stop: 58400, Start Num: 15

Candidate Starts for Deenasa\_68:

(2, 57891), (3, 57909), (4, 57921), (6, 57966), (12, 58101), (Start: 15 @58113 has 22 MA's), (18, 58131), (Start: 20 @58143 has 27 MA's), (Start: 23 @58152 has 4 MA's), (25, 58161), (47, 58305), (55, 58362),

Gene: Devonte\_67 Start: 56889, Stop: 57176, Start Num: 15

Candidate Starts for Devonte\_67:

(2, 56667), (3, 56685), (4, 56697), (6, 56742), (12, 56877), (Start: 15 @56889 has 22 MA's), (18, 56907), (Start: 20 @56919 has 27 MA's), (Start: 23 @56928 has 4 MA's), (25, 56937), (47, 57081), (55, 57138),

Gene: Eaglehorse\_64 Start: 55458, Stop: 55718, Start Num: 20

Candidate Starts for Eaglehorse\_64:

(Start: 20 @55458 has 27 MA's), (Start: 23 @55467 has 4 MA's), (33, 55512), (Start: 36 @55539 has 1 MA's), (41, 55566), (45, 55593), (50, 55635), (54, 55668), (55, 55677), (56, 55689),

Gene: Evaa\_60 Start: 49769, Stop: 50017, Start Num: 24

Candidate Starts for Evaa\_60:

(Start: 24 @49769 has 1 MA's), (26, 49775), (29, 49784), (31, 49793), (Start: 36 @49835 has 1 MA's), (42, 49874), (44, 49883), (48, 49925), (49, 49928),

Gene: FrenchFry\_65 Start: 55583, Stop: 55843, Start Num: 20

Candidate Starts for FrenchFry\_65:

(Start: 20 @55583 has 27 MA's), (Start: 23 @55592 has 4 MA's), (33, 55637), (Start: 36 @55664 has 1 MA's), (41, 55691), (45, 55718), (50, 55760), (54, 55793), (55, 55802), (56, 55814),

Gene: Fresco\_62 Start: 50626, Stop: 50826, Start Num: 30

Candidate Starts for Fresco\_62:

(Start: 19 @50590 has 1 MA's), (Start: 30 @50626 has 10 MA's), (46, 50728), (53, 50788), (57, 50815),

Gene: Gadjet\_69 Start: 57577, Stop: 57864, Start Num: 15

Candidate Starts for Gadjet\_69:

(2, 57355), (3, 57373), (4, 57385), (6, 57430), (12, 57565), (Start: 15 @57577 has 22 MA's), (18, 57595), (Start: 20 @57607 has 27 MA's), (Start: 23 @57616 has 4 MA's), (25, 57625), (47, 57769), (55, 57826),

Gene: Glass\_65 Start: 55585, Stop: 55845, Start Num: 20

Candidate Starts for Glass\_65:

(Start: 20 @55585 has 27 MA's), (Start: 23 @55594 has 4 MA's), (33, 55639), (Start: 36 @55666 has 1 MA's), (41, 55693), (45, 55720), (50, 55762), (54, 55795), (55, 55804), (56, 55816),



Gene: GlenHope\_69 Start: 57237, Stop: 57524, Start Num: 15

Candidate Starts for GlenHope\_69:

(2, 57015), (3, 57033), (4, 57045), (6, 57090), (12, 57225), (Start: 15 @57237 has 22 MA's), (18, 57255), (Start: 20 @57267 has 27 MA's), (Start: 23 @57276 has 4 MA's), (25, 57285), (47, 57429), (55, 57486),

Gene: Godines\_65 Start: 55844, Stop: 56104, Start Num: 20

Candidate Starts for Godines\_65:

(Start: 20 @55844 has 27 MA's), (Start: 23 @55853 has 4 MA's), (33, 55898), (Start: 36 @55925 has 1 MA's), (41, 55952), (45, 55979), (50, 56021), (54, 56054), (55, 56063), (56, 56075),

Gene: Halfpint\_67 Start: 56988, Stop: 57275, Start Num: 15

Candidate Starts for Halfpint\_67:

(2, 56766), (3, 56784), (4, 56796), (6, 56841), (12, 56976), (Start: 15 @56988 has 22 MA's), (18, 57006), (Start: 20 @57018 has 27 MA's), (Start: 23 @57027 has 4 MA's), (25, 57036), (47, 57180), (55, 57237),

Gene: Heathcliff\_68 Start: 57204, Stop: 57491, Start Num: 15

Candidate Starts for Heathcliff\_68:

(2, 56982), (3, 57000), (4, 57012), (6, 57057), (12, 57192), (Start: 15 @57204 has 22 MA's), (18, 57222), (Start: 20 @57234 has 27 MA's), (Start: 23 @57243 has 4 MA's), (25, 57252), (47, 57396), (55, 57453),

Gene: Hedgerow\_64 Start: 55555, Stop: 55815, Start Num: 20

Candidate Starts for Hedgerow\_64:

(Start: 20 @55555 has 27 MA's), (Start: 23 @55564 has 4 MA's), (33, 55609), (Start: 36 @55636 has 1 MA's), (41, 55663), (45, 55690), (50, 55732), (54, 55765), (55, 55774), (56, 55786),

Gene: Holeinone\_64 Start: 55443, Stop: 55703, Start Num: 20

Candidate Starts for Holeinone\_64:

(Start: 20 @55443 has 27 MA's), (Start: 23 @55452 has 4 MA's), (33, 55497), (Start: 36 @55524 has 1 MA's), (41, 55551), (45, 55578), (50, 55620), (54, 55653), (55, 55662), (56, 55674),

Gene: ItsyBitsy1\_63 Start: 55673, Stop: 55933, Start Num: 20

Candidate Starts for ItsyBitsy1\_63:

(Start: 20 @55673 has 27 MA's), (Start: 23 @55682 has 4 MA's), (33, 55727), (Start: 36 @55754 has 1 MA's), (41, 55781), (45, 55808), (50, 55850), (54, 55883), (55, 55892), (56, 55904),

Gene: Jackstina\_64 Start: 57129, Stop: 57416, Start Num: 15

Candidate Starts for Jackstina\_64:

(2, 56907), (3, 56925), (4, 56937), (6, 56982), (12, 57117), (Start: 15 @57129 has 22 MA's), (18, 57147), (Start: 20 @57159 has 27 MA's), (Start: 23 @57168 has 4 MA's), (25, 57177), (47, 57321), (55, 57378),

Gene: Kheth\_64 Start: 55502, Stop: 55762, Start Num: 20

Candidate Starts for Kheth\_64:

(Start: 20 @55502 has 27 MA's), (Start: 23 @55511 has 4 MA's), (33, 55556), (Start: 36 @55583 has 1 MA's), (41, 55610), (45, 55637), (50, 55679), (54, 55712), (55, 55721), (56, 55733),

Gene: Kolhan\_65 Start: 55479, Stop: 55739, Start Num: 20

Candidate Starts for Kolhan\_65:

(Start: 20 @55479 has 27 MA's), (Start: 23 @55488 has 4 MA's), (33, 55533), (Start: 36 @55560 has 1 MA's), (41, 55587), (45, 55614), (50, 55656), (54, 55689), (55, 55698), (56, 55710),

Gene: Lars\_65 Start: 55572, Stop: 55823, Start Num: 23

Candidate Starts for Lars\_65:

(Start: 20 @55563 has 27 MA's), (Start: 23 @55572 has 4 MA's), (33, 55617), (Start: 36 @55644 has 1 MA's), (41, 55671), (45, 55698), (50, 55740), (54, 55773), (55, 55782), (56, 55794),

Gene: Laurie\_64 Start: 55263, Stop: 55523, Start Num: 20

Candidate Starts for Laurie\_64:

(Start: 20 @55263 has 27 MA's), (Start: 23 @55272 has 4 MA's), (33, 55317), (Start: 36 @55344 has 1 MA's), (41, 55371), (45, 55398), (50, 55440), (54, 55473), (55, 55482), (56, 55494),

Gene: Lephleur\_64 Start: 55428, Stop: 55688, Start Num: 20

Candidate Starts for Lephleur\_64:

(Start: 20 @55428 has 27 MA's), (Start: 23 @55437 has 4 MA's), (33, 55482), (Start: 36 @55509 has 1 MA's), (41, 55536), (45, 55563), (50, 55605), (54, 55638), (55, 55647), (56, 55659),

Gene: Ligma\_62 Start: 50626, Stop: 50826, Start Num: 30

Candidate Starts for Ligma\_62:

(Start: 19 @50590 has 1 MA's), (Start: 30 @50626 has 10 MA's), (46, 50728), (53, 50788), (57, 50815),

Gene: LilSmirk\_64 Start: 55461, Stop: 55721, Start Num: 20

Candidate Starts for LilSmirk\_64:

(Start: 20 @55461 has 27 MA's), (Start: 23 @55470 has 4 MA's), (33, 55515), (Start: 36 @55542 has 1 MA's), (41, 55569), (45, 55596), (50, 55638), (54, 55671), (55, 55680), (56, 55692),

Gene: LittleMunchkin\_63 Start: 53357, Stop: 53581, Start Num: 30

Candidate Starts for LittleMunchkin\_63:

(Start: 30 @53357 has 10 MA's), (42, 53456), (46, 53483), (51, 53531), (53, 53543), (57, 53570),

Gene: LizLemon\_64 Start: 55590, Stop: 55850, Start Num: 20

Candidate Starts for LizLemon\_64:

(Start: 20 @55590 has 27 MA's), (Start: 23 @55599 has 4 MA's), (33, 55644), (Start: 36 @55671 has 1 MA's), (41, 55698), (45, 55725), (50, 55767), (54, 55800), (55, 55809), (56, 55821),

Gene: MakoManhole\_59 Start: 50530, Stop: 50700, Start Num: 37

Candidate Starts for MakoManhole\_59:

(Start: 37 @50530 has 3 MA's), (53, 50662), (57, 50689),

Gene: Mariokart\_58 Start: 49462, Stop: 49695, Start Num: 19

Candidate Starts for Mariokart\_58:

(Start: 19 @49462 has 1 MA's), (Start: 30 @49498 has 10 MA's), (46, 49600), (53, 49660),

Gene: MasterPo\_65 Start: 55460, Stop: 55720, Start Num: 20

Candidate Starts for MasterPo\_65:

(Start: 20 @55460 has 27 MA's), (Start: 23 @55469 has 4 MA's), (33, 55514), (Start: 36 @55541 has 1 MA's), (41, 55568), (45, 55595), (50, 55637), (54, 55670), (55, 55679), (56, 55691),

Gene: Morty007\_67 Start: 58277, Stop: 58441, Start Num: 36

Candidate Starts for Morty007\_67:

(9, 58082), (Start: 20 @58208 has 27 MA's), (Start: 23 @58217 has 4 MA's), (25, 58226), (Start: 36 @58277 has 1 MA's), (55, 58403),

Gene: NHagos\_59 Start: 49828, Stop: 50055, Start Num: 27

Candidate Starts for NHagos\_59:

(Start: 27 @49828 has 1 MA's), (28, 49831), (Start: 30 @49837 has 10 MA's), (Start: 36 @49864 has 1 MA's), (52, 49987), (53, 49996), (57, 50023),

Gene: Nozo\_68 Start: 58013, Stop: 58300, Start Num: 15

Candidate Starts for Nozo\_68:

(2, 57791), (3, 57809), (4, 57821), (6, 57866), (12, 58001), (Start: 15 @58013 has 22 MA's), (18, 58031), (Start: 20 @58043 has 27 MA's), (Start: 23 @58052 has 4 MA's), (25, 58061), (47, 58205), (55, 58262),

Gene: Opia\_65 Start: 55480, Stop: 55740, Start Num: 20

Candidate Starts for Opia\_65:

(Start: 20 @55480 has 27 MA's), (Start: 23 @55489 has 4 MA's), (33, 55534), (Start: 36 @55561 has 1 MA's), (41, 55588), (45, 55615), (50, 55657), (54, 55690), (55, 55699), (56, 55711),

Gene: OrangeOswald\_68 Start: 57254, Stop: 57541, Start Num: 15

Candidate Starts for OrangeOswald\_68:

(2, 57032), (3, 57050), (4, 57062), (6, 57107), (12, 57242), (Start: 15 @57254 has 22 MA's), (18, 57272), (Start: 20 @57284 has 27 MA's), (Start: 23 @57293 has 4 MA's), (25, 57302), (47, 57446), (55, 57503),

Gene: Philly\_67 Start: 57066, Stop: 57353, Start Num: 15

Candidate Starts for Philly\_67:

(2, 56844), (3, 56862), (4, 56874), (6, 56919), (12, 57054), (Start: 15 @57066 has 22 MA's), (18, 57084), (Start: 20 @57096 has 27 MA's), (Start: 23 @57105 has 4 MA's), (25, 57114), (47, 57258), (55, 57315),

Gene: Phlyer\_68 Start: 57962, Stop: 58249, Start Num: 15

Candidate Starts for Phlyer\_68:

(2, 57740), (3, 57758), (4, 57770), (6, 57815), (12, 57950), (Start: 15 @57962 has 22 MA's), (18, 57980), (Start: 20 @57992 has 27 MA's), (Start: 23 @58001 has 4 MA's), (25, 58010), (47, 58154), (55, 58211),

Gene: Pipefish\_71 Start: 58442, Stop: 58660, Start Num: 23

Candidate Starts for Pipefish\_71:

(7, 58295), (10, 58382), (11, 58400), (Start: 23 @58442 has 4 MA's), (25, 58451), (34, 58487), (43, 58529), (47, 58565), (55, 58622),

Gene: Qyrzula\_58 Start: 55591, Stop: 55851, Start Num: 20

Candidate Starts for Qyrzula\_58:

(Start: 20 @55591 has 27 MA's), (Start: 23 @55600 has 4 MA's), (33, 55645), (Start: 36 @55672 has 1 MA's), (41, 55699), (45, 55726), (50, 55768), (54, 55801), (55, 55810), (56, 55822),

Gene: RagingRooster\_67 Start: 56894, Stop: 57181, Start Num: 15

Candidate Starts for RagingRooster\_67:

(2, 56672), (3, 56690), (4, 56702), (6, 56747), (12, 56882), (Start: 15 @56894 has 22 MA's), (18, 56912), (Start: 20 @56924 has 27 MA's), (Start: 23 @56933 has 4 MA's), (25, 56942), (47, 57086), (55, 57143),

Gene: Rhinoforte\_64 Start: 55513, Stop: 55773, Start Num: 20

Candidate Starts for Rhinoforte\_64:

(Start: 20 @55513 has 27 MA's), (Start: 23 @55522 has 4 MA's), (33, 55567), (Start: 36 @55594 has 1 MA's), (41, 55621), (45, 55648), (50, 55690), (54, 55723), (55, 55732), (56, 55744),

Gene: Rita1961\_69 Start: 57612, Stop: 57899, Start Num: 15

Candidate Starts for Rita1961\_69:

(2, 57390), (3, 57408), (4, 57420), (6, 57465), (12, 57600), (Start: 15 @57612 has 22 MA's), (18, 57630), (Start: 20 @57642 has 27 MA's), (Start: 23 @57651 has 4 MA's), (25, 57660), (47, 57804), (55, 57861),

Gene: RomaT\_68 Start: 57813, Stop: 58100, Start Num: 15

Candidate Starts for RomaT\_68:

(2, 57591), (3, 57609), (4, 57621), (6, 57666), (12, 57801), (Start: 15 @57813 has 22 MA's), (18, 57831), (Start: 20 @57843 has 27 MA's), (Start: 23 @57852 has 4 MA's), (25, 57861), (47, 58005), (55, 58062),

Gene: Rosebush\_63 Start: 55576, Stop: 55836, Start Num: 20

Candidate Starts for Rosebush\_63:

(Start: 20 @55576 has 27 MA's), (Start: 23 @55585 has 4 MA's), (33, 55630), (Start: 36 @55657 has 1 MA's), (41, 55684), (45, 55711), (50, 55753), (54, 55786), (55, 55795), (56, 55807),

Gene: Sabella\_64 Start: 55412, Stop: 55672, Start Num: 20

Candidate Starts for Sabella\_64:

(Start: 20 @55412 has 27 MA's), (Start: 23 @55421 has 4 MA's), (33, 55466), (Start: 36 @55493 has 1 MA's), (41, 55520), (45, 55547), (50, 55589), (54, 55622), (55, 55631), (56, 55643),

Gene: Shatter\_62 Start: 50626, Stop: 50826, Start Num: 30

Candidate Starts for Shatter\_62:

(Start: 19 @50590 has 1 MA's), (Start: 30 @50626 has 10 MA's), (46, 50728), (53, 50788), (57, 50815),

Gene: Sisko\_60 Start: 50847, Stop: 51044, Start Num: 30

Candidate Starts for Sisko\_60:

(Start: 30 @50847 has 10 MA's), (43, 50925), (46, 50946), (53, 51006), (57, 51033),

Gene: Sour\_62 Start: 53064, Stop: 53273, Start Num: 30

Candidate Starts for Sour\_62:

(Start: 19 @53028 has 1 MA's), (Start: 30 @53064 has 10 MA's), (43, 53154), (53, 53235), (57, 53262),

Gene: SynergyX\_68 Start: 57251, Stop: 57538, Start Num: 15

Candidate Starts for SynergyX\_68:

(2, 57029), (3, 57047), (4, 57059), (6, 57104), (12, 57239), (Start: 15 @57251 has 22 MA's), (18, 57269), (Start: 20 @57281 has 27 MA's), (Start: 23 @57290 has 4 MA's), (25, 57299), (47, 57443), (55, 57500),

Gene: Thonko\_67 Start: 56230, Stop: 56466, Start Num: 32

Candidate Starts for Thonko\_67:

(1, 55804), (5, 55999), (8, 56032), (16, 56158), (21, 56191), (Start: 23 @56197 has 4 MA's), (Start: 32 @56230 has 1 MA's), (Start: 35 @56260 has 3 MA's), (43, 56326), (46, 56347), (47, 56362),

Gene: Tinciduntolum\_65 Start: 55579, Stop: 55839, Start Num: 20

Candidate Starts for Tinciduntolum\_65:

(Start: 20 @55579 has 27 MA's), (Start: 23 @55588 has 4 MA's), (33, 55633), (41, 55687), (45, 55714), (50, 55756), (54, 55789), (55, 55798), (56, 55810),

Gene: Tres\_64 Start: 55433, Stop: 55693, Start Num: 20

Candidate Starts for Tres\_64:

(Start: 20 @55433 has 27 MA's), (Start: 23 @55442 has 4 MA's), (33, 55487), (Start: 36 @55514 has 1 MA's), (41, 55541), (45, 55568), (50, 55610), (54, 55643), (55, 55652), (56, 55664),

Gene: UAch1\_68 Start: 57127, Stop: 57306, Start Num: 35

Candidate Starts for UAch1\_68:

(17, 57034), (Start: 20 @57055 has 27 MA's), (Start: 23 @57064 has 4 MA's), (Start: 35 @57127 has 3 MA's), (41, 57154), (56, 57277),

Gene: West99\_64 Start: 55606, Stop: 55866, Start Num: 20

Candidate Starts for West99\_64:

(Start: 20 @55606 has 27 MA's), (Start: 23 @55615 has 4 MA's), (33, 55660), (Start: 36 @55687 has 1 MA's), (41, 55714), (45, 55741), (50, 55783), (54, 55816), (55, 55825), (56, 55837),

Gene: Wooper\_63 Start: 51561, Stop: 51731, Start Num: 37

Candidate Starts for Wooper\_63:

(Start: 35 @51552 has 3 MA's), (Start: 37 @51561 has 3 MA's), (53, 51693), (57, 51720),

Gene: Yago84\_59 Start: 50332, Stop: 50529, Start Num: 30

Candidate Starts for Yago84\_59:

(Start: 30 @50332 has 10 MA's), (43, 50410), (46, 50431), (53, 50491), (57, 50518),

Gene: Yeshua\_63 Start: 51529, Stop: 51708, Start Num: 35

Candidate Starts for Yeshua\_63:

(Start: 35 @51529 has 3 MA's), (Start: 37 @51538 has 3 MA's), (53, 51670), (57, 51697),

Gene: Yinz\_68 Start: 57121, Stop: 57408, Start Num: 15

Candidate Starts for Yinz\_68:

(2, 56899), (3, 56917), (4, 56929), (6, 56974), (12, 57109), (Start: 15 @57121 has 22 MA's), (18, 57139), (Start: 20 @57151 has 27 MA's), (Start: 23 @57160 has 4 MA's), (25, 57169), (47, 57313), (55, 57370),