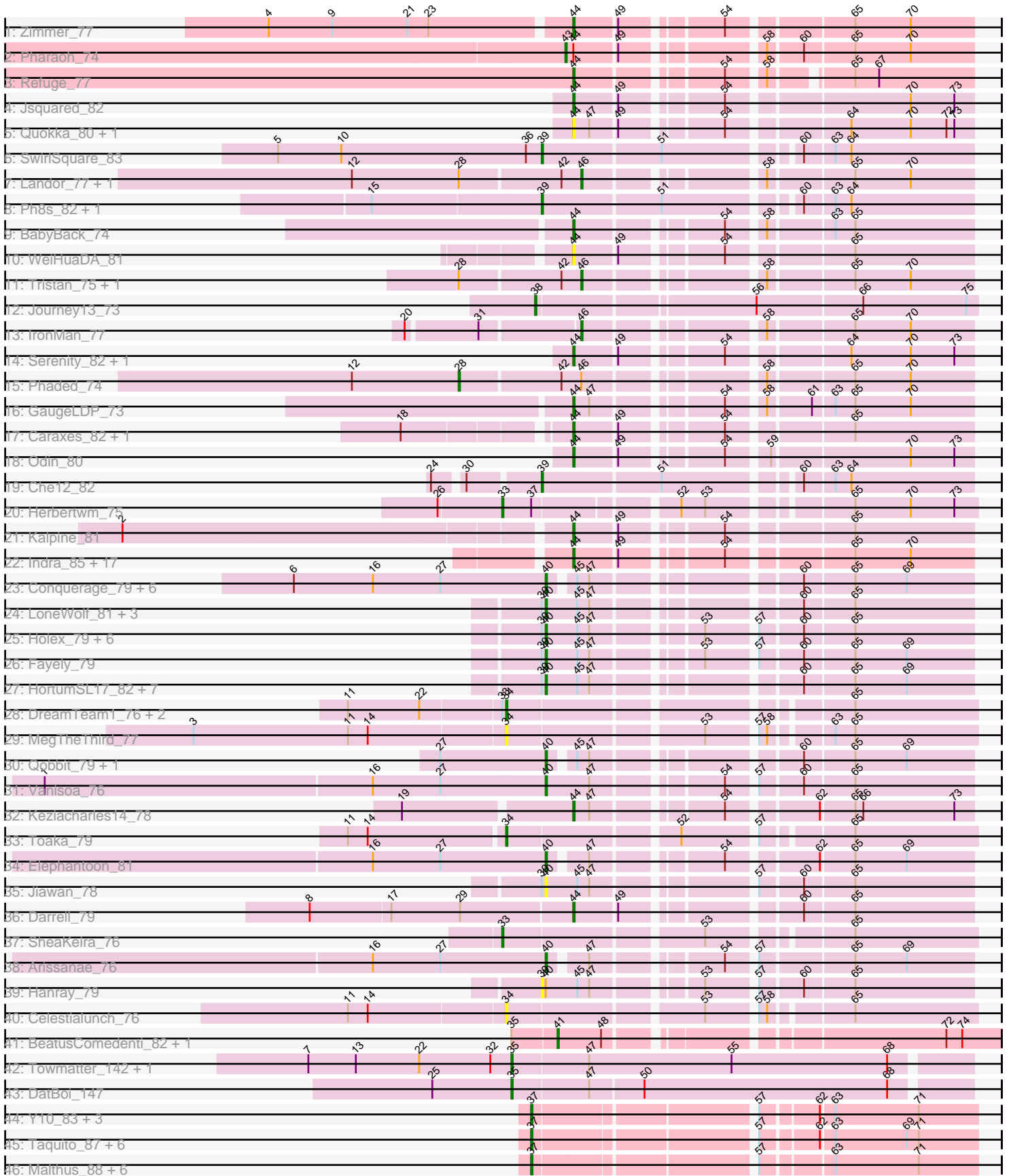


Pham 311402



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 311402 Report

This analysis was run 06/27/26 on database version 652.

Pham number 311402 has 111 members, 18 are drafts.

Phages represented in each track:

- Track 1 : Zimmer\_77
- Track 2 : Pharaoh\_74
- Track 3 : Refuge\_77
- Track 4 : Jsquared\_82
- Track 5 : Quokka\_80, Bradman\_81
- Track 6 : SwirlSquare\_83
- Track 7 : Landor\_77, Bactobuster\_71
- Track 8 : Ph8s\_82, Adzzy\_82
- Track 9 : BabyBack\_74
- Track 10 : WeiHuaDA\_81
- Track 11 : Tristan\_75, Jaan\_77
- Track 12 : Journey13\_73
- Track 13 : IronMan\_77
- Track 14 : Serenity\_82, TipsytheTRex\_78
- Track 15 : Phaded\_74
- Track 16 : GaugeLDP\_73
- Track 17 : Caraxes\_82, Superchunk\_81
- Track 18 : Odin\_80
- Track 19 : Che12\_82
- Track 20 : Herbertwm\_75
- Track 21 : Kalpine\_81
- Track 22 : Indra\_85, Lilbunny\_81, Zaka\_82, Tucker\_82, Zulu\_83, ToneTone\_79, Artemis2UCLA\_81, BennyP\_82, WunderPhul\_82, Yokurt\_81, Koko\_83, Blue7\_83, BlessJoy\_82, Garak\_83, Helmet\_84, Roksolana\_82, Temprado\_83, Wiks\_81
- Track 23 : Conquerage\_79, Alma\_79, Priya\_79, Ayanochan\_79, ExplosioNervosa\_79, Eidsmoe\_79, EmyBug\_78
- Track 24 : LoneWolf\_81, Sachima\_77, EdogawaKiddo\_79, Lilleskat\_78
- Track 25 : Halex\_79, Phonnegut\_81, Onglai\_79, Scherzo\_79, Beemo\_81, RyeScarlet\_82, Pioneer\_81
- Track 26 : Fayely\_79
- Track 27 : HortumSL17\_82, Tubs\_81, Catalina\_83, PackMan\_80, BogosyJay\_80, Myxus\_81, Phaeder\_81, Maminaiaina\_80
- Track 28 : DreamTeam1\_76, Klodlith\_77, Charm\_76
- Track 29 : MegTheThird\_77
- Track 30 : Qobbit\_79, Spouty\_79
- Track 31 : Vanisoa\_76
- Track 32 : Keziacharles14\_78

- Track 33 : Toaka\_79
- Track 34 : Elephantoon\_81
- Track 35 : Jiawan\_78
- Track 36 : Darrell\_79
- Track 37 : SheaKeira\_76
- Track 38 : Arissanae\_76
- Track 39 : Hanray\_79
- Track 40 : Celestiallunch\_76
- Track 41 : BeatusComedenti\_82, Kitkat\_83
- Track 42 : Towmatter\_142, Daredevil\_145
- Track 43 : DatBoi\_147
- Track 44 : Y10\_83, JF1\_87, Y2\_83, YasnayaPolyana\_86
- Track 45 : Taquito\_87, Mitti\_87, Chancellor\_87, SamScheppers\_86, Lebo14\_86, OmniCritical\_87, DanSyl44\_90
- Track 46 : Malthus\_88, Ruthiejr\_89, Fionnbharth\_87, Kraw\_87, Eponine\_89, Wintermute\_87, Juliette\_89

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

The start number called the most often in the published annotations is 44, it was called in 29 of the 93 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Artemis2UCLA\_81, BabyBack\_74, BennyP\_82, BlessJoy\_82, Blue7\_83, Bradman\_81, Caraxes\_82, Darrell\_79, Garak\_83, GaugeLDP\_73, Helmet\_84, Indra\_85, Jsquared\_82, Kalpine\_81, Keziacharles14\_78, Koko\_83, Lilbunny\_81, Odin\_80, Quokka\_80, Refuge\_77, Roksolana\_82, Serenity\_82, Superchunk\_81, Temprado\_83, TopsytheTRex\_78, ToneTone\_79, Tucker\_82, WeiHuaDA\_81, Wiks\_81, WunderPhul\_82, Yokurt\_81, Zaka\_82, Zimmer\_77, Zulu\_83,

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

- Pharaoh\_74,

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

- Adzzy\_82, Alma\_79, Arissanae\_76, Ayanochan\_79, Bactobuster\_71, BeatusComedenti\_82, Beemo\_81, BogosyJay\_80, Catalina\_83, Celestiallunch\_76, Chancellor\_87, Charm\_76, Che12\_82, Conquerage\_79, DanSyl44\_90, Daredevil\_145, DatBoi\_147, DreamTeam1\_76, EdogawaKiddo\_79, Eidsmoe\_79, Elephantoon\_81, EmyBug\_78, Eponine\_89, ExplosioNervosa\_79, Fayely\_79, Fionnbharth\_87, Hanray\_79, Herbertwm\_75, Horex\_79, HortumSL17\_82, IronMan\_77, JF1\_87, Jaan\_77, Jiawan\_78, Journey13\_73, Juliette\_89, Kitkat\_83, Klodlith\_77, Kraw\_87, Landor\_77, Lebo14\_86, Lilleskat\_78, LoneWolf\_81, Malthus\_88, Maminiaina\_80, MegTheThird\_77, Mitti\_87, Myxus\_81, OmniCritical\_87, Onglai\_79, PackMan\_80, Ph8s\_82, Phaded\_74, Phaeder\_81, Phonnegut\_81, Pioneer\_81, Priya\_79, Qobbit\_79, Ruthiejr\_89, RyeScarlet\_82, Sachima\_77, SamScheppers\_86, Scherzo\_79, SheaKeira\_76, Spouty\_79, SwirlSquare\_83, Taquito\_87, Toaka\_79, Towmatter\_142, Tristan\_75, Tubs\_81, Vanisoa\_76, Wintermute\_87, Y10\_83, Y2\_83, YasnayaPolyana\_86,

**Summary by start number:**

Start 28:

- Found in 5 of 111 ( 4.5% ) of genes in pham
- Manual Annotations of this start: 1 of 93
- Called 20.0% of time when present
- Phage (with cluster) where this start called: Phaded\_74 (A2),

Start 33:

- Found in 5 of 111 ( 4.5% ) of genes in pham
- Manual Annotations of this start: 2 of 93
- Called 40.0% of time when present
- Phage (with cluster) where this start called: Herbertwm\_75 (A2), SheaKeira\_76 (A9),

Start 34:

- Found in 6 of 111 ( 5.4% ) of genes in pham
- Manual Annotations of this start: 3 of 93
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Celestialunch\_76 (A9), Charm\_76 (A9), DreamTeam1\_76 (A9), Klodlith\_77 (A9), MegTheThird\_77 (A9), Toaka\_79 (A9),

Start 35:

- Found in 5 of 111 ( 4.5% ) of genes in pham
- Manual Annotations of this start: 3 of 93
- Called 60.0% of time when present
- Phage (with cluster) where this start called: Daredevil\_145 (DL), DatBoi\_147 (DL), Towmatter\_142 (DL),

Start 37:

- Found in 19 of 111 ( 17.1% ) of genes in pham
- Manual Annotations of this start: 17 of 93
- Called 94.7% of time when present
- Phage (with cluster) where this start called: Chancellor\_87 (K4), DanSyl44\_90 (K4), Eponine\_89 (K4), Fionnbharth\_87 (K4), JF1\_87 (K4), Juliette\_89 (K4), Kraw\_87 (K4), Lebo14\_86 (K4), Malthus\_88 (K4), Mitti\_87 (K4), OmniCritical\_87 (K4), Ruthiejr\_89 (K4), SamScheppers\_86 (K4), Taquito\_87 (K4), Wintermute\_87 (K4), Y10\_83 (K4), Y2\_83 (K4), YasnayaPolyana\_86 (K4),

Start 38:

- Found in 1 of 111 ( 0.9% ) of genes in pham
- Manual Annotations of this start: 1 of 93
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Journey13\_73 (A2),

Start 39:

- Found in 26 of 111 ( 23.4% ) of genes in pham
- Manual Annotations of this start: 4 of 93
- Called 19.2% of time when present
- Phage (with cluster) where this start called: Adzzy\_82 (A2), Che12\_82 (A2), Hanray\_79 (A9), Ph8s\_82 (A2), SwirlSquare\_83 (A2),

Start 40:

- Found in 34 of 111 ( 30.6% ) of genes in pham
- Manual Annotations of this start: 25 of 93

- Called 97.1% of time when present
- Phage (with cluster) where this start called: Alma\_79 (A9), Arissanae\_76 (A9), Ayanochan\_79 (A9), Beemo\_81 (A9), BogosyJay\_80 (A9), Catalina\_83 (A9), Conquerage\_79 (A9), EdogawaKiddo\_79 (A9), Eidsmoe\_79 (A9), Elephantoon\_81 (A9), EmyBug\_78 (A9), ExplosioNervosa\_79 (A9), Fayely\_79 (A9), Horex\_79 (A9), HortumSL17\_82 (A9), Jiawan\_78 (A9), Lilleskat\_78 (A9), LoneWolf\_81 (A9), Maminiaina\_80 (A9), Myxus\_81 (A9), Onglai\_79 (A9), PackMan\_80 (A9), Phaeder\_81 (A9), Phonnegut\_81 (A9), Pioneer\_81 (A9), Priya\_79 (A9), Qobbit\_79 (A9), RyeScarlet\_82 (A9), Sachima\_77 (A9), Scherzo\_79 (A9), Spouty\_79 (A9), Tubs\_81 (A9), Vanisoa\_76 (A9),

#### Start 41:

- Found in 2 of 111 ( 1.8% ) of genes in pham
- Manual Annotations of this start: 2 of 93
- Called 100.0% of time when present
- Phage (with cluster) where this start called: BeatusComedenti\_82 (AT), Kitkat\_83 (AT),

#### Start 43:

- Found in 1 of 111 ( 0.9% ) of genes in pham
- Manual Annotations of this start: 1 of 93
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Pharaoh\_74 (A12),

#### Start 44:

- Found in 35 of 111 ( 31.5% ) of genes in pham
- Manual Annotations of this start: 29 of 93
- Called 97.1% of time when present
- Phage (with cluster) where this start called: Artemis2UCLA\_81 (A6), BabyBack\_74 (A2), BennyP\_82 (A6), BlessJoy\_82 (A6), Blue7\_83 (A6), Bradman\_81 (A2), Caraxes\_82 (A2), Darrell\_79 (A9), Garak\_83 (A6), GaugeLDP\_73 (A2), Helmet\_84 (A6), Indra\_85 (A6), Jsquared\_82 (A2), Kalpine\_81 (A2), Keziacharles14\_78 (A9), Koko\_83 (A6), Lilbunny\_81 (A6), Odin\_80 (A2), Quokka\_80 (A2), Refuge\_77 (A12), Roksolana\_82 (A6), Serenity\_82 (A2), Superchunk\_81 (A2), Temprado\_83 (A6), TopsytheTRex\_78 (A2), ToneTone\_79 (A6), Tucker\_82 (A6), WeiHuaDA\_81 (A2), Wiks\_81 (A6), WunderPhul\_82 (A6), Yokurt\_81 (A6), Zaka\_82 (A6), Zimmer\_77 (A12), Zulu\_83 (A6),

#### Start 46:

- Found in 6 of 111 ( 5.4% ) of genes in pham
- Manual Annotations of this start: 5 of 93
- Called 83.3% of time when present
- Phage (with cluster) where this start called: Bactobuster\_71 (A2), IronMan\_77 (A2), Jaan\_77 (A2), Landor\_77 (A2), Tristan\_75 (A2),

### Summary by clusters:

There are 7 clusters represented in this pham: DL, A12, A6, A2, AT, K4, A9,

#### Info for manual annotations of cluster A12:

- Start number 43 was manually annotated 1 time for cluster A12.
- Start number 44 was manually annotated 2 times for cluster A12.

Info for manual annotations of cluster A2:

- Start number 28 was manually annotated 1 time for cluster A2.
- Start number 33 was manually annotated 1 time for cluster A2.
- Start number 38 was manually annotated 1 time for cluster A2.
- Start number 39 was manually annotated 4 times for cluster A2.
- Start number 44 was manually annotated 8 times for cluster A2.
- Start number 46 was manually annotated 5 times for cluster A2.

Info for manual annotations of cluster A6:

- Start number 44 was manually annotated 17 times for cluster A6.

Info for manual annotations of cluster A9:

- Start number 33 was manually annotated 1 time for cluster A9.
- Start number 34 was manually annotated 3 times for cluster A9.
- Start number 40 was manually annotated 25 times for cluster A9.
- Start number 44 was manually annotated 2 times for cluster A9.

Info for manual annotations of cluster AT:

- Start number 41 was manually annotated 2 times for cluster AT.

Info for manual annotations of cluster DL:

- Start number 35 was manually annotated 3 times for cluster DL.

Info for manual annotations of cluster K4:

- Start number 37 was manually annotated 17 times for cluster K4.

### ***Gene Information:***

Gene: Adzzy\_82 Start: 46155, Stop: 45853, Start Num: 39

Candidate Starts for Adzzy\_82:

(15, 46278), (Start: 39 @46155 has 4 MA's), (51, 46068), (60, 45978), (63, 45957), (64, 45945),

Gene: Alma\_79 Start: 45799, Stop: 45518, Start Num: 40

Candidate Starts for Alma\_79:

(6, 45988), (16, 45928), (27, 45877), (Start: 40 @45799 has 25 MA's), (45, 45784), (47, 45775), (60, 45643), (65, 45607), (69, 45568),

Gene: Arissanae\_76 Start: 45697, Stop: 45416, Start Num: 40

Candidate Starts for Arissanae\_76:

(16, 45826), (27, 45775), (Start: 40 @45697 has 25 MA's), (47, 45673), (54, 45589), (57, 45571), (65, 45505), (69, 45466),

Gene: Artemis2UCLA\_81 Start: 45088, Stop: 44819, Start Num: 44

Candidate Starts for Artemis2UCLA\_81:

(Start: 44 @45088 has 29 MA's), (49, 45058), (54, 44992), (65, 44908), (70, 44866),

Gene: Ayanochan\_79 Start: 45582, Stop: 45301, Start Num: 40

Candidate Starts for Ayanochan\_79:

(6, 45771), (16, 45711), (27, 45660), (Start: 40 @45582 has 25 MA's), (45, 45567), (47, 45558), (60, 45426), (65, 45390), (69, 45351),

Gene: BabyBack\_74 Start: 46100, Stop: 45831, Start Num: 44

Candidate Starts for BabyBack\_74:

(Start: 44 @46100 has 29 MA's), (54, 46004), (58, 45980), (63, 45935), (65, 45920),

Gene: Bactobuster\_71 Start: 45904, Stop: 45641, Start Num: 46

Candidate Starts for Bactobuster\_71:

(12, 46072), (Start: 28 @45991 has 1 MA's), (42, 45919), (Start: 46 @45904 has 5 MA's), (58, 45790), (65, 45730), (70, 45688),

Gene: BeatusComedenti\_82 Start: 49130, Stop: 49429, Start Num: 41

Candidate Starts for BeatusComedenti\_82:

(Start: 35 @49097 has 3 MA's), (Start: 41 @49130 has 2 MA's), (48, 49163), (72, 49388), (74, 49400),

Gene: Beemo\_81 Start: 45795, Stop: 45505, Start Num: 40

Candidate Starts for Beemo\_81:

(Start: 39 @45798 has 4 MA's), (Start: 40 @45795 has 25 MA's), (45, 45771), (47, 45762), (53, 45693), (57, 45660), (60, 45630), (65, 45594),

Gene: BennyP\_82 Start: 45253, Stop: 44984, Start Num: 44

Candidate Starts for BennyP\_82:

(Start: 44 @45253 has 29 MA's), (49, 45223), (54, 45157), (65, 45073), (70, 45031),

Gene: BlessJoy\_82 Start: 45609, Stop: 45340, Start Num: 44

Candidate Starts for BlessJoy\_82:

(Start: 44 @45609 has 29 MA's), (49, 45579), (54, 45513), (65, 45429), (70, 45387),

Gene: Blue7\_83 Start: 45307, Stop: 45038, Start Num: 44

Candidate Starts for Blue7\_83:

(Start: 44 @45307 has 29 MA's), (49, 45277), (54, 45211), (65, 45127), (70, 45085),

Gene: BogosyJay\_80 Start: 45850, Stop: 45560, Start Num: 40

Candidate Starts for BogosyJay\_80:

(Start: 39 @45853 has 4 MA's), (Start: 40 @45850 has 25 MA's), (45, 45826), (47, 45817), (60, 45685), (65, 45649), (69, 45610),

Gene: Bradman\_81 Start: 45826, Stop: 45557, Start Num: 44

Candidate Starts for Bradman\_81:

(Start: 44 @45826 has 29 MA's), (47, 45814), (49, 45796), (54, 45730), (64, 45649), (70, 45604), (72, 45577), (73, 45571),

Gene: Caraxes\_82 Start: 46112, Stop: 45843, Start Num: 44

Candidate Starts for Caraxes\_82:

(18, 46223), (Start: 44 @46112 has 29 MA's), (49, 46082), (54, 46016), (65, 45932),

Gene: Catalina\_83 Start: 45905, Stop: 45615, Start Num: 40

Candidate Starts for Catalina\_83:

(Start: 39 @45908 has 4 MA's), (Start: 40 @45905 has 25 MA's), (45, 45881), (47, 45872), (60, 45740), (65, 45704), (69, 45665),

Gene: Celestiallunch\_76 Start: 45203, Stop: 44883, Start Num: 34

Candidate Starts for Celestiallunch\_76:

(11, 45317), (14, 45302), (Start: 34 @45203 has 3 MA's), (53, 45068), (57, 45035), (58, 45029), (65, 44975),

Gene: Chancellor\_87 Start: 53125, Stop: 53433, Start Num: 37

Candidate Starts for Chancellor\_87:

(Start: 37 @53125 has 17 MA's), (57, 53278), (62, 53317), (63, 53326), (69, 53380), (71, 53389),

Gene: Charm\_76 Start: 45350, Stop: 45030, Start Num: 34

Candidate Starts for Charm\_76:

(11, 45464), (22, 45410), (Start: 33 @45353 has 2 MA's), (Start: 34 @45350 has 3 MA's), (65, 45122),

Gene: Che12\_82 Start: 46057, Stop: 45755, Start Num: 39

Candidate Starts for Che12\_82:

(24, 46123), (30, 46105), (Start: 39 @46057 has 4 MA's), (51, 45970), (60, 45880), (63, 45859), (64, 45847),

Gene: Conquerage\_79 Start: 45568, Stop: 45287, Start Num: 40

Candidate Starts for Conquerage\_79:

(6, 45757), (16, 45697), (27, 45646), (Start: 40 @45568 has 25 MA's), (45, 45553), (47, 45544), (60, 45412), (65, 45376), (69, 45337),

Gene: DanSyl44\_90 Start: 54510, Stop: 54818, Start Num: 37

Candidate Starts for DanSyl44\_90:

(Start: 37 @54510 has 17 MA's), (57, 54663), (62, 54702), (63, 54711), (69, 54765), (71, 54774),

Gene: Daredevil\_145 Start: 81837, Stop: 81499, Start Num: 35

Candidate Starts for Daredevil\_145:

(7, 81990), (13, 81954), (22, 81906), (32, 81852), (Start: 35 @81837 has 3 MA's), (47, 81780), (55, 81672), (68, 81555),

Gene: Darrell\_79 Start: 45002, Stop: 44733, Start Num: 44

Candidate Starts for Darrell\_79:

(8, 45194), (17, 45134), (29, 45083), (Start: 44 @45002 has 29 MA's), (49, 44972), (60, 44858), (65, 44822),

Gene: DatBoi\_147 Start: 84121, Stop: 83786, Start Num: 35

Candidate Starts for DatBoi\_147:

(25, 84181), (Start: 35 @84121 has 3 MA's), (47, 84064), (50, 84025), (68, 83842),

Gene: DreamTeam1\_76 Start: 45198, Stop: 44878, Start Num: 34

Candidate Starts for DreamTeam1\_76:

(11, 45312), (22, 45258), (Start: 33 @45201 has 2 MA's), (Start: 34 @45198 has 3 MA's), (65, 44970),

Gene: EdogawaKiddo\_79 Start: 45873, Stop: 45583, Start Num: 40

Candidate Starts for EdogawaKiddo\_79:

(Start: 39 @45876 has 4 MA's), (Start: 40 @45873 has 25 MA's), (45, 45849), (47, 45840), (60, 45708), (65, 45672),

Gene: Eidsmoe\_79 Start: 45560, Stop: 45279, Start Num: 40

Candidate Starts for Eidsmoe\_79:

(6, 45749), (16, 45689), (27, 45638), (Start: 40 @45560 has 25 MA's), (45, 45545), (47, 45536), (60, 45404), (65, 45368), (69, 45329),

Gene: Elephantoon\_81 Start: 45725, Stop: 45444, Start Num: 40

Candidate Starts for Elephantoon\_81:

(16, 45854), (27, 45803), (Start: 40 @45725 has 25 MA's), (47, 45701), (54, 45617), (62, 45557), (65, 45533), (69, 45494),

Gene: EmyBug\_78 Start: 45562, Stop: 45281, Start Num: 40

Candidate Starts for EmyBug\_78:

(6, 45751), (16, 45691), (27, 45640), (Start: 40 @45562 has 25 MA's), (45, 45547), (47, 45538), (60, 45406), (65, 45370), (69, 45331),

Gene: Eponine\_89 Start: 54105, Stop: 54413, Start Num: 37

Candidate Starts for Eponine\_89:

(Start: 37 @54105 has 17 MA's), (57, 54258), (63, 54306), (71, 54369),

Gene: ExplosioNervosa\_79 Start: 45628, Stop: 45347, Start Num: 40

Candidate Starts for ExplosioNervosa\_79:

(6, 45817), (16, 45757), (27, 45706), (Start: 40 @45628 has 25 MA's), (45, 45613), (47, 45604), (60, 45472), (65, 45436), (69, 45397),

Gene: Fayely\_79 Start: 45538, Stop: 45248, Start Num: 40

Candidate Starts for Fayely\_79:

(Start: 39 @45541 has 4 MA's), (Start: 40 @45538 has 25 MA's), (45, 45514), (47, 45505), (53, 45436), (57, 45403), (60, 45373), (65, 45337), (69, 45298),

Gene: Fionnbharth\_87 Start: 53503, Stop: 53811, Start Num: 37

Candidate Starts for Fionnbharth\_87:

(Start: 37 @53503 has 17 MA's), (57, 53656), (63, 53704), (71, 53767),

Gene: Garak\_83 Start: 45550, Stop: 45281, Start Num: 44

Candidate Starts for Garak\_83:

(Start: 44 @45550 has 29 MA's), (49, 45520), (54, 45454), (65, 45370), (70, 45328),

Gene: GaugeLDP\_73 Start: 45685, Stop: 45416, Start Num: 44

Candidate Starts for GaugeLDP\_73:

(Start: 44 @45685 has 29 MA's), (47, 45673), (54, 45589), (58, 45565), (61, 45535), (63, 45520), (65, 45505), (70, 45463),

Gene: Hanray\_79 Start: 45852, Stop: 45559, Start Num: 39

Candidate Starts for Hanray\_79:

(Start: 39 @45852 has 4 MA's), (Start: 40 @45849 has 25 MA's), (45, 45825), (47, 45816), (53, 45747), (57, 45714), (60, 45684), (65, 45648),

Gene: Helmet\_84 Start: 45550, Stop: 45281, Start Num: 44

Candidate Starts for Helmet\_84:

(Start: 44 @45550 has 29 MA's), (49, 45520), (54, 45454), (65, 45370), (70, 45328),

Gene: Herbertwm\_75 Start: 45969, Stop: 45649, Start Num: 33

Candidate Starts for Herbertwm\_75:

(26, 46014), (Start: 33 @45969 has 2 MA's), (Start: 37 @45948 has 17 MA's), (52, 45852), (53, 45834), (65, 45741), (70, 45699), (73, 45666),

Gene: Holecx\_79 Start: 45865, Stop: 45575, Start Num: 40

Candidate Starts for Holecx\_79:

(Start: 39 @45868 has 4 MA's), (Start: 40 @45865 has 25 MA's), (45, 45841), (47, 45832), (53, 45763), (57, 45730), (60, 45700), (65, 45664),

Gene: HortumSL17\_82 Start: 45903, Stop: 45613, Start Num: 40

Candidate Starts for HortumSL17\_82:

(Start: 39 @45906 has 4 MA's), (Start: 40 @45903 has 25 MA's), (45, 45879), (47, 45870), (60, 45738), (65, 45702), (69, 45663),

Gene: Indra\_85 Start: 45551, Stop: 45282, Start Num: 44

Candidate Starts for Indra\_85:

(Start: 44 @45551 has 29 MA's), (49, 45521), (54, 45455), (65, 45371), (70, 45329),

Gene: IronMan\_77 Start: 47577, Stop: 47314, Start Num: 46

Candidate Starts for IronMan\_77:

(20, 47697), (31, 47646), (Start: 46 @47577 has 5 MA's), (58, 47463), (65, 47403), (70, 47361),

Gene: JF1\_87 Start: 53421, Stop: 53729, Start Num: 37

Candidate Starts for JF1\_87:

(Start: 37 @53421 has 17 MA's), (57, 53574), (62, 53613), (63, 53622), (71, 53685),

Gene: Jaan\_77 Start: 47534, Stop: 47271, Start Num: 46

Candidate Starts for Jaan\_77:

(Start: 28 @47621 has 1 MA's), (42, 47549), (Start: 46 @47534 has 5 MA's), (58, 47420), (65, 47360), (70, 47318),

Gene: Jiawan\_78 Start: 45881, Stop: 45591, Start Num: 40

Candidate Starts for Jiawan\_78:

(Start: 39 @45884 has 4 MA's), (Start: 40 @45881 has 25 MA's), (45, 45857), (47, 45848), (57, 45746), (60, 45716), (65, 45680),

Gene: Journey13\_73 Start: 44569, Stop: 44249, Start Num: 38

Candidate Starts for Journey13\_73:

(Start: 38 @44569 has 1 MA's), (56, 44413), (66, 44335), (75, 44257),

Gene: Jsquared\_82 Start: 45959, Stop: 45690, Start Num: 44

Candidate Starts for Jsquared\_82:

(Start: 44 @45959 has 29 MA's), (49, 45929), (54, 45863), (70, 45737), (73, 45704),

Gene: Juliette\_89 Start: 53534, Stop: 53842, Start Num: 37

Candidate Starts for Juliette\_89:

(Start: 37 @53534 has 17 MA's), (57, 53687), (63, 53735), (71, 53798),

Gene: Kalpine\_81 Start: 47285, Stop: 47016, Start Num: 44

Candidate Starts for Kalpine\_81:

(2, 47609), (Start: 44 @47285 has 29 MA's), (49, 47255), (54, 47189), (65, 47105),

Gene: Keziacharles14\_78 Start: 46501, Stop: 46232, Start Num: 44

Candidate Starts for Keziacharles14\_78:

(19, 46621), (Start: 44 @46501 has 29 MA's), (47, 46489), (54, 46405), (62, 46345), (65, 46321), (66, 46315), (73, 46246),

Gene: Kitkat\_83 Start: 49195, Stop: 49494, Start Num: 41

Candidate Starts for Kitkat\_83:

(Start: 35 @49162 has 3 MA's), (Start: 41 @49195 has 2 MA's), (48, 49228), (72, 49453), (74, 49465),

Gene: Klodlith\_77 Start: 45420, Stop: 45100, Start Num: 34  
Candidate Starts for Klodlith\_77:  
(11, 45534), (22, 45480), (Start: 33 @45423 has 2 MA's), (Start: 34 @45420 has 3 MA's), (65, 45192),

Gene: Koko\_83 Start: 45940, Stop: 45671, Start Num: 44  
Candidate Starts for Koko\_83:  
(Start: 44 @45940 has 29 MA's), (49, 45910), (54, 45844), (65, 45760), (70, 45718),

Gene: Kraw\_87 Start: 53243, Stop: 53551, Start Num: 37  
Candidate Starts for Kraw\_87:  
(Start: 37 @53243 has 17 MA's), (57, 53396), (63, 53444), (71, 53507),

Gene: Landor\_77 Start: 47461, Stop: 47198, Start Num: 46  
Candidate Starts for Landor\_77:  
(12, 47629), (Start: 28 @47548 has 1 MA's), (42, 47476), (Start: 46 @47461 has 5 MA's), (58, 47347),  
(65, 47287), (70, 47245),

Gene: Lebo14\_86 Start: 53657, Stop: 53965, Start Num: 37  
Candidate Starts for Lebo14\_86:  
(Start: 37 @53657 has 17 MA's), (57, 53810), (62, 53849), (63, 53858), (69, 53912), (71, 53921),

Gene: Lilbunny\_81 Start: 45182, Stop: 44913, Start Num: 44  
Candidate Starts for Lilbunny\_81:  
(Start: 44 @45182 has 29 MA's), (49, 45152), (54, 45086), (65, 45002), (70, 44960),

Gene: Lilleskat\_78 Start: 45862, Stop: 45572, Start Num: 40  
Candidate Starts for Lilleskat\_78:  
(Start: 39 @45865 has 4 MA's), (Start: 40 @45862 has 25 MA's), (45, 45838), (47, 45829), (60, 45697),  
(65, 45661),

Gene: LoneWolf\_81 Start: 45915, Stop: 45625, Start Num: 40  
Candidate Starts for LoneWolf\_81:  
(Start: 39 @45918 has 4 MA's), (Start: 40 @45915 has 25 MA's), (45, 45891), (47, 45882), (60, 45750),  
(65, 45714),

Gene: Malthus\_88 Start: 53243, Stop: 53551, Start Num: 37  
Candidate Starts for Malthus\_88:  
(Start: 37 @53243 has 17 MA's), (57, 53396), (63, 53444), (71, 53507),

Gene: Maminiaina\_80 Start: 45832, Stop: 45542, Start Num: 40  
Candidate Starts for Maminiaina\_80:  
(Start: 39 @45835 has 4 MA's), (Start: 40 @45832 has 25 MA's), (45, 45808), (47, 45799), (60, 45667),  
(65, 45631), (69, 45592),

Gene: MegTheThird\_77 Start: 45421, Stop: 45101, Start Num: 34  
Candidate Starts for MegTheThird\_77:  
(3, 45652), (11, 45535), (14, 45520), (Start: 34 @45421 has 3 MA's), (53, 45286), (57, 45253), (58,  
45247), (63, 45208), (65, 45193),

Gene: Mitti\_87 Start: 53399, Stop: 53707, Start Num: 37  
Candidate Starts for Mitti\_87:  
(Start: 37 @53399 has 17 MA's), (57, 53552), (62, 53591), (63, 53600), (69, 53654), (71, 53663),

Gene: Myxus\_81 Start: 45903, Stop: 45613, Start Num: 40

Candidate Starts for Myxus\_81:

(Start: 39 @45906 has 4 MA's), (Start: 40 @45903 has 25 MA's), (45, 45879), (47, 45870), (60, 45738), (65, 45702), (69, 45663),

Gene: Odin\_80 Start: 46431, Stop: 46162, Start Num: 44

Candidate Starts for Odin\_80:

(Start: 44 @46431 has 29 MA's), (49, 46401), (54, 46335), (59, 46308), (70, 46209), (73, 46176),

Gene: OmniCritical\_87 Start: 53401, Stop: 53709, Start Num: 37

Candidate Starts for OmniCritical\_87:

(Start: 37 @53401 has 17 MA's), (57, 53554), (62, 53593), (63, 53602), (69, 53656), (71, 53665),

Gene: Onglai\_79 Start: 44053, Stop: 43763, Start Num: 40

Candidate Starts for Onglai\_79:

(Start: 39 @44056 has 4 MA's), (Start: 40 @44053 has 25 MA's), (45, 44029), (47, 44020), (53, 43951), (57, 43918), (60, 43888), (65, 43852),

Gene: PackMan\_80 Start: 45778, Stop: 45488, Start Num: 40

Candidate Starts for PackMan\_80:

(Start: 39 @45781 has 4 MA's), (Start: 40 @45778 has 25 MA's), (45, 45754), (47, 45745), (60, 45613), (65, 45577), (69, 45538),

Gene: Ph8s\_82 Start: 46368, Stop: 46066, Start Num: 39

Candidate Starts for Ph8s\_82:

(15, 46491), (Start: 39 @46368 has 4 MA's), (51, 46281), (60, 46191), (63, 46170), (64, 46158),

Gene: Phaded\_74 Start: 47507, Stop: 47157, Start Num: 28

Candidate Starts for Phaded\_74:

(12, 47588), (Start: 28 @47507 has 1 MA's), (42, 47435), (Start: 46 @47420 has 5 MA's), (58, 47306), (65, 47246), (70, 47204),

Gene: Phaeder\_81 Start: 45778, Stop: 45488, Start Num: 40

Candidate Starts for Phaeder\_81:

(Start: 39 @45781 has 4 MA's), (Start: 40 @45778 has 25 MA's), (45, 45754), (47, 45745), (60, 45613), (65, 45577), (69, 45538),

Gene: Pharaoh\_74 Start: 45796, Stop: 45521, Start Num: 43

Candidate Starts for Pharaoh\_74:

(Start: 43 @45796 has 1 MA's), (Start: 44 @45790 has 29 MA's), (49, 45760), (58, 45670), (60, 45646), (65, 45610), (70, 45568),

Gene: Phonnegut\_81 Start: 45794, Stop: 45504, Start Num: 40

Candidate Starts for Phonnegut\_81:

(Start: 39 @45797 has 4 MA's), (Start: 40 @45794 has 25 MA's), (45, 45770), (47, 45761), (53, 45692), (57, 45659), (60, 45629), (65, 45593),

Gene: Pioneer\_81 Start: 45794, Stop: 45504, Start Num: 40

Candidate Starts for Pioneer\_81:

(Start: 39 @45797 has 4 MA's), (Start: 40 @45794 has 25 MA's), (45, 45770), (47, 45761), (53, 45692), (57, 45659), (60, 45629), (65, 45593),

Gene: Priya\_79 Start: 45563, Stop: 45282, Start Num: 40

Candidate Starts for Priya\_79:

(6, 45752), (16, 45692), (27, 45641), (Start: 40 @45563 has 25 MA's), (45, 45548), (47, 45539), (60, 45407), (65, 45371), (69, 45332),

Gene: Qobbit\_79 Start: 45525, Stop: 45244, Start Num: 40

Candidate Starts for Qobbit\_79:

(27, 45603), (Start: 40 @45525 has 25 MA's), (45, 45510), (47, 45501), (60, 45369), (65, 45333), (69, 45294),

Gene: Quokka\_80 Start: 45827, Stop: 45558, Start Num: 44

Candidate Starts for Quokka\_80:

(Start: 44 @45827 has 29 MA's), (47, 45815), (49, 45797), (54, 45731), (64, 45650), (70, 45605), (72, 45578), (73, 45572),

Gene: Refuge\_77 Start: 47109, Stop: 46849, Start Num: 44

Candidate Starts for Refuge\_77:

(Start: 44 @47109 has 29 MA's), (54, 47013), (58, 46989), (65, 46938), (67, 46920),

Gene: Roksolana\_82 Start: 45446, Stop: 45177, Start Num: 44

Candidate Starts for Roksolana\_82:

(Start: 44 @45446 has 29 MA's), (49, 45416), (54, 45350), (65, 45266), (70, 45224),

Gene: Ruthiejr\_89 Start: 53294, Stop: 53602, Start Num: 37

Candidate Starts for Ruthiejr\_89:

(Start: 37 @53294 has 17 MA's), (57, 53447), (63, 53495), (71, 53558),

Gene: RyeScarlet\_82 Start: 45769, Stop: 45479, Start Num: 40

Candidate Starts for RyeScarlet\_82:

(Start: 39 @45772 has 4 MA's), (Start: 40 @45769 has 25 MA's), (45, 45745), (47, 45736), (53, 45667), (57, 45634), (60, 45604), (65, 45568),

Gene: Sachima\_77 Start: 45806, Stop: 45516, Start Num: 40

Candidate Starts for Sachima\_77:

(Start: 39 @45809 has 4 MA's), (Start: 40 @45806 has 25 MA's), (45, 45782), (47, 45773), (60, 45641), (65, 45605),

Gene: SamScheppers\_86 Start: 53779, Stop: 54087, Start Num: 37

Candidate Starts for SamScheppers\_86:

(Start: 37 @53779 has 17 MA's), (57, 53932), (62, 53971), (63, 53980), (69, 54034), (71, 54043),

Gene: Scherzo\_79 Start: 45826, Stop: 45536, Start Num: 40

Candidate Starts for Scherzo\_79:

(Start: 39 @45829 has 4 MA's), (Start: 40 @45826 has 25 MA's), (45, 45802), (47, 45793), (53, 45724), (57, 45691), (60, 45661), (65, 45625),

Gene: Serenity\_82 Start: 46019, Stop: 45750, Start Num: 44

Candidate Starts for Serenity\_82:

(Start: 44 @46019 has 29 MA's), (49, 45989), (54, 45923), (64, 45842), (70, 45797), (73, 45764),

Gene: SheaKeira\_76 Start: 45229, Stop: 44906, Start Num: 33

Candidate Starts for SheaKeira\_76:

(Start: 33 @45229 has 2 MA's), (53, 45091), (65, 44998),

Gene: Spouty\_79 Start: 45562, Stop: 45281, Start Num: 40  
Candidate Starts for Spouty\_79:  
(27, 45640), (Start: 40 @45562 has 25 MA's), (45, 45547), (47, 45538), (60, 45406), (65, 45370), (69, 45331),

Gene: Superchunk\_81 Start: 46112, Stop: 45843, Start Num: 44  
Candidate Starts for Superchunk\_81:  
(18, 46223), (Start: 44 @46112 has 29 MA's), (49, 46082), (54, 46016), (65, 45932),

Gene: SwirlSquare\_83 Start: 45806, Stop: 45504, Start Num: 39  
Candidate Starts for SwirlSquare\_83:  
(5, 46004), (10, 45956), (36, 45818), (Start: 39 @45806 has 4 MA's), (51, 45719), (60, 45629), (63, 45608), (64, 45596),

Gene: Taquito\_87 Start: 53748, Stop: 54056, Start Num: 37  
Candidate Starts for Taquito\_87:  
(Start: 37 @53748 has 17 MA's), (57, 53901), (62, 53940), (63, 53949), (69, 54003), (71, 54012),

Gene: Temprado\_83 Start: 45550, Stop: 45281, Start Num: 44  
Candidate Starts for Temprado\_83:  
(Start: 44 @45550 has 29 MA's), (49, 45520), (54, 45454), (65, 45370), (70, 45328),

Gene: TipsytheTRex\_78 Start: 46021, Stop: 45752, Start Num: 44  
Candidate Starts for TipsytheTRex\_78:  
(Start: 44 @46021 has 29 MA's), (49, 45991), (54, 45925), (64, 45844), (70, 45799), (73, 45766),

Gene: Toaka\_79 Start: 45790, Stop: 45470, Start Num: 34  
Candidate Starts for Toaka\_79:  
(11, 45904), (14, 45889), (Start: 34 @45790 has 3 MA's), (52, 45673), (57, 45622), (65, 45562),

Gene: ToneTone\_79 Start: 45110, Stop: 44841, Start Num: 44  
Candidate Starts for ToneTone\_79:  
(Start: 44 @45110 has 29 MA's), (49, 45080), (54, 45014), (65, 44930), (70, 44888),

Gene: Towmatter\_142 Start: 81918, Stop: 81580, Start Num: 35  
Candidate Starts for Towmatter\_142:  
(7, 82071), (13, 82035), (22, 81987), (32, 81933), (Start: 35 @81918 has 3 MA's), (47, 81861), (55, 81753), (68, 81636),

Gene: Tristan\_75 Start: 47271, Stop: 47008, Start Num: 46  
Candidate Starts for Tristan\_75:  
(Start: 28 @47358 has 1 MA's), (42, 47286), (Start: 46 @47271 has 5 MA's), (58, 47157), (65, 47097), (70, 47055),

Gene: Tubs\_81 Start: 45778, Stop: 45488, Start Num: 40  
Candidate Starts for Tubs\_81:  
(Start: 39 @45781 has 4 MA's), (Start: 40 @45778 has 25 MA's), (45, 45754), (47, 45745), (60, 45613), (65, 45577), (69, 45538),

Gene: Tucker\_82 Start: 45313, Stop: 45044, Start Num: 44  
Candidate Starts for Tucker\_82:  
(Start: 44 @45313 has 29 MA's), (49, 45283), (54, 45217), (65, 45133), (70, 45091),

Gene: Vanisoa\_76 Start: 46019, Stop: 45729, Start Num: 40  
Candidate Starts for Vanisoa\_76:  
(1, 46394), (16, 46148), (27, 46097), (Start: 40 @46019 has 25 MA's), (47, 45986), (54, 45902), (57, 45884), (60, 45854), (65, 45818),

Gene: WeiHuaDA\_81 Start: 47572, Stop: 47303, Start Num: 44  
Candidate Starts for WeiHuaDA\_81:  
(Start: 44 @47572 has 29 MA's), (49, 47542), (54, 47476), (65, 47392),

Gene: Wiks\_81 Start: 45181, Stop: 44912, Start Num: 44  
Candidate Starts for Wiks\_81:  
(Start: 44 @45181 has 29 MA's), (49, 45151), (54, 45085), (65, 45001), (70, 44959),

Gene: Wintermute\_87 Start: 53471, Stop: 53779, Start Num: 37  
Candidate Starts for Wintermute\_87:  
(Start: 37 @53471 has 17 MA's), (57, 53624), (63, 53672), (71, 53735),

Gene: WunderPhul\_82 Start: 45179, Stop: 44910, Start Num: 44  
Candidate Starts for WunderPhul\_82:  
(Start: 44 @45179 has 29 MA's), (49, 45149), (54, 45083), (65, 44999), (70, 44957),

Gene: Y10\_83 Start: 53421, Stop: 53729, Start Num: 37  
Candidate Starts for Y10\_83:  
(Start: 37 @53421 has 17 MA's), (57, 53574), (62, 53613), (63, 53622), (71, 53685),

Gene: Y2\_83 Start: 53421, Stop: 53729, Start Num: 37  
Candidate Starts for Y2\_83:  
(Start: 37 @53421 has 17 MA's), (57, 53574), (62, 53613), (63, 53622), (71, 53685),

Gene: YasnayaPolyana\_86 Start: 53407, Stop: 53715, Start Num: 37  
Candidate Starts for YasnayaPolyana\_86:  
(Start: 37 @53407 has 17 MA's), (57, 53560), (62, 53599), (63, 53608), (71, 53671),

Gene: Yokurt\_81 Start: 45181, Stop: 44912, Start Num: 44  
Candidate Starts for Yokurt\_81:  
(Start: 44 @45181 has 29 MA's), (49, 45151), (54, 45085), (65, 45001), (70, 44959),

Gene: Zaka\_82 Start: 45181, Stop: 44912, Start Num: 44  
Candidate Starts for Zaka\_82:  
(Start: 44 @45181 has 29 MA's), (49, 45151), (54, 45085), (65, 45001), (70, 44959),

Gene: Zimmer\_77 Start: 46661, Stop: 46392, Start Num: 44  
Candidate Starts for Zimmer\_77:  
(4, 46880), (9, 46832), (21, 46775), (23, 46760), (Start: 44 @46661 has 29 MA's), (49, 46631), (54, 46565), (65, 46481), (70, 46439),

Gene: Zulu\_83 Start: 45559, Stop: 45290, Start Num: 44  
Candidate Starts for Zulu\_83:  
(Start: 44 @45559 has 29 MA's), (49, 45529), (54, 45463), (65, 45379), (70, 45337),