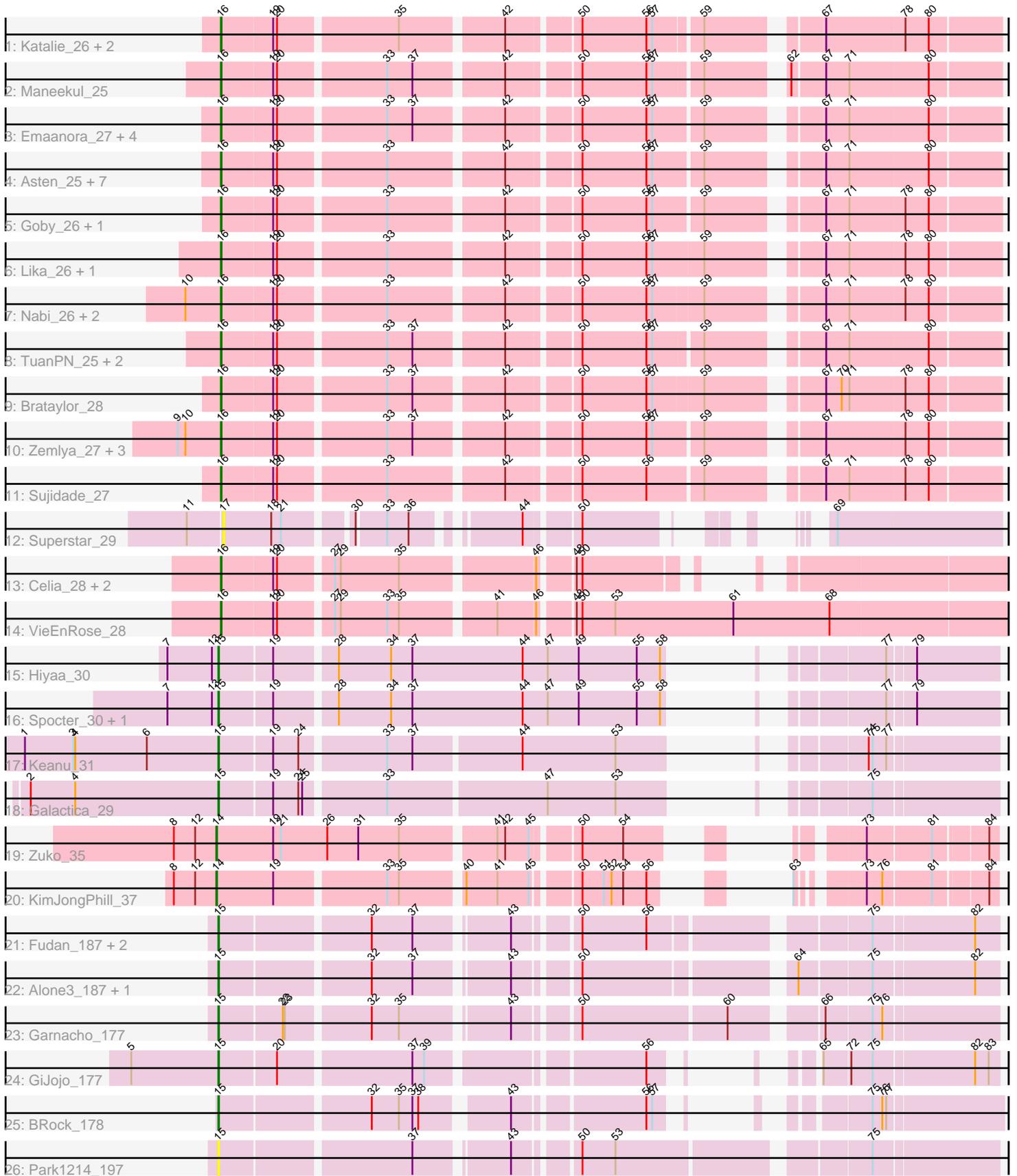# Pham 283869

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 283869 Report

This analysis was run 02/23/26 on database version 636.

Pham number 283869 has 54 members, 5 are drafts.

Phages represented in each track:
• Track 1 : Katalie_26, RedBear_27, South40_26
• Track 2 : Maneekul_25
• Track 3 : Emaanora_27, OzzyJ_26, Hippo_25, SarahRose_25, Dwayne_25
• Track 4 : Asten_25, Triste_25, BarryBee_27, Snorlax_25, TagePhighter_26, Whatever_25, Chucky_25, Werner_25
• Track 5 : Goby_26, Toma_26
• Track 6 : Lika_26, Godpower_27
• Track 7 : Nabi_26, Rana_26, Lorelei_26
• Track 8 : TuanPN_25, Yasdnil_25, Ejemplo_25
• Track 9 : Brataylor_28
• Track 10 : Zemlya_27, Danzina_27, Celeste_26, Dattran_27
• Track 11 : Sujidade_27
• Track 12 : Superstar_29
• Track 13 : Celia_28, Itza_28, Urza_28
• Track 14 : VieEnRose_28
• Track 15 : Hiyaa_30
• Track 16 : Spocter_30, Kokushibo_32
• Track 17 : Keanu_31
• Track 18 : Galactica_29
• Track 19 : Zuko_35
• Track 20 : KimJongPhill_37
• Track 21 : Fudan_187, LuckySocke_185, Talos_187
• Track 22 : Alone3_187, Beleetus_185
• Track 23 : Garnacho_177
• Track 24 : GiJojo_177
• Track 25 : BRock_178
• Track 26 : Park1214_197

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

The start number called the most often in the published annotations is 16, it was called in 37 of the 49 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

• Asten_25, BarryBee_27, Brataylor_28, Celeste_26, Celia_28, Chucky_25, Danzina_27, Dattran_27, Dwayne_25, Ejemplo_25, Emaanora_27, Goby_26, Godpower_27, Hippo_25, Itza_28, Katalie_26, Lika_26, Lorelei_26, Maneekul_25, Nabi_26, OzzyJ_26, Rana_26, RedBear_27, SarahRose_25, Snorlax_25, South40_26, Sujidade_27, TagePhighter_26, Toma_26, Triste_25, TuanPN_25, Urza_28, VieEnRose_28, Werner_25, Whatever_25, Yasdnil_25, Zemlya_27,

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

Genes that do not have the "Most Annotated" start:
• Alone3_187, BRock_178, Beleetus_185, Fudan_187, Galactica_29, Garnacho_177, GiJojo_177, Hiyaa_30, Keanu_31, KimJongPhill_37, Kokushibo_32, LuckySocke_185, Park1214_197, Spocter_30, Superstar_29, Talos_187, Zuko_35,

Summary by start number:

Start 14:
• Found in 2 of 54 (3.7%) of genes in pham
• Manual Annotations of this start: 2 of 49
• Called 100.0% of time when present
• Phage (with cluster) where this start called: KimJongPhill_37 (BR), Zuko_35 (BR),

Start 15:
• Found in 14 of 54 (25.9%) of genes in pham
• Manual Annotations of this start: 10 of 49
• Called 100.0% of time when present
• Phage (with cluster) where this start called: Alone3_187 (BS), BRock_178 (BS), Beleetus_185 (BS), Fudan_187 (BS), Galactica_29 (BQ), Garnacho_177 (BS), GiJojo_177 (BS), Hiyaa_30 (BQ), Keanu_31 (BQ), Kokushibo_32 (BQ), LuckySocke_185 (BS), Park1214_197 (BS), Spocter_30 (BQ), Talos_187 (BS),

Start 16:
• Found in 37 of 54 (68.5%) of genes in pham
• Manual Annotations of this start: 37 of 49
• Called 100.0% of time when present
• Phage (with cluster) where this start called: Asten_25 (BD1), BarryBee_27 (BD1), Brataylor_28 (BD1), Celeste_26 (BD1), Celia_28 (BD6), Chucky_25 (BD1), Danzina_27 (BD1), Dattran_27 (BD1), Dwayne_25 (BD1), Ejemplo_25 (BD1), Emaanora_27 (BD1), Goby_26 (BD1), Godpower_27 (BD1), Hippo_25 (BD1), Itza_28 (BD6), Katalie_26 (BD1), Lika_26 (BD1), Lorelei_26 (BD1), Maneekul_25 (BD1), Nabi_26 (BD1), OzzyJ_26 (BD1), Rana_26 (BD1), RedBear_27 (BD1), SarahRose_25 (BD1), Snorlax_25 (BD1), South40_26 (BD1), Sujidade_27 (BD1), TagePhighter_26 (BD1), Toma_26 (BD1), Triste_25 (BD1), TuanPN_25 (BD1), Urza_28 (BD6), VieEnRose_28 (BD6), Werner_25 (BD1), Whatever_25 (BD1), Yasdnil_25 (BD1), Zemlya_27 (BD1),

Start 17:
• Found in 1 of 54 (1.9%) of genes in pham
• No Manual Annotations of this start.
• Called 100.0% of time when present
• Phage (with cluster) where this start called: Superstar_29 (BD2),

Summary by clusters:

There are 6 clusters represented in this pham: BD2, BD6, BD1, BQ, BR, BS,

Info for manual annotations of cluster BD1:
•Start number 16 was manually annotated 33 times for cluster BD1.

Info for manual annotations of cluster BD6:
•Start number 16 was manually annotated 4 times for cluster BD6.

Info for manual annotations of cluster BQ:
•Start number 15 was manually annotated 4 times for cluster BQ.

Info for manual annotations of cluster BR:
•Start number 14 was manually annotated 2 times for cluster BR.

Info for manual annotations of cluster BS:
•Start number 15 was manually annotated 6 times for cluster BS.

Gene Information:
Gene: Alone3_187 Start: 95865, Stop: 96938, Start Num: 15
Candidate Starts for Alone3_187:
(Start: 15 @95865 has 10 MA's), (32, 96081), (37, 96144), (43, 96273), (50, 96357), (64, 96648), (75, 96753), (82, 96903),

Gene: Asten_25 Start: 21080, Stop: 22168, Start Num: 16
Candidate Starts for Asten_25:
(Start: 16 @21080 has 37 MA's), (19, 21158), (20, 21164), (33, 21320), (42, 21485), (50, 21581), (56, 21680), (57, 21689), (59, 21761), (67, 21905), (71, 21941), (80, 22061),

Gene: BRock_178 Start: 91256, Stop: 92188, Start Num: 15
Candidate Starts for BRock_178:
(Start: 15 @91256 has 10 MA's), (32, 91472), (35, 91514), (37, 91535), (38, 91544), (43, 91661), (56, 91844), (57, 91853), (75, 91994), (76, 92009), (77, 92015),

Gene: BarryBee_27 Start: 21090, Stop: 22178, Start Num: 16
Candidate Starts for BarryBee_27:
(Start: 16 @21090 has 37 MA's), (19, 21168), (20, 21174), (33, 21330), (42, 21495), (50, 21591), (56, 21690), (57, 21699), (59, 21771), (67, 21915), (71, 21951), (80, 22071),

Gene: Beleetus_185 Start: 94526, Stop: 95599, Start Num: 15
Candidate Starts for Beleetus_185:
(Start: 15 @94526 has 10 MA's), (32, 94742), (37, 94805), (43, 94934), (50, 95018), (64, 95309), (75, 95414), (82, 95564),

Gene: Brataylor_28 Start: 22093, Stop: 23187, Start Num: 16
Candidate Starts for Brataylor_28:
(Start: 16 @22093 has 37 MA's), (19, 22171), (20, 22177), (33, 22333), (37, 22372), (42, 22498), (50, 22594), (56, 22693), (57, 22702), (59, 22777), (67, 22924), (70, 22948), (71, 22960), (78, 23044), (80,

23080),

Gene: Celeste_26 Start: 21546, Stop: 22634, Start Num: 16
Candidate Starts for Celeste_26:
(9, 21483), (10, 21495), (Start: 16 @21546 has 37 MA's), (19, 21624), (20, 21630), (33, 21786), (37, 21825), (42, 21951), (50, 22047), (56, 22146), (57, 22155), (59, 22227), (67, 22371), (78, 22491), (80, 22527),

Gene: Celia_28 Start: 21987, Stop: 22973, Start Num: 16
Candidate Starts for Celia_28:
(Start: 16 @21987 has 37 MA's), (19, 22065), (20, 22071), (27, 22146), (29, 22155), (35, 22245), (46, 22437), (48, 22479), (50, 22485),

Gene: Chucky_25 Start: 21094, Stop: 22182, Start Num: 16
Candidate Starts for Chucky_25:
(Start: 16 @21094 has 37 MA's), (19, 21172), (20, 21178), (33, 21334), (42, 21499), (50, 21595), (56, 21694), (57, 21703), (59, 21775), (67, 21919), (71, 21955), (80, 22075),

Gene: Danzina_27 Start: 21847, Stop: 22935, Start Num: 16
Candidate Starts for Danzina_27:
(9, 21784), (10, 21796), (Start: 16 @21847 has 37 MA's), (19, 21925), (20, 21931), (33, 22087), (37, 22126), (42, 22252), (50, 22348), (56, 22447), (57, 22456), (59, 22528), (67, 22672), (78, 22792), (80, 22828),

Gene: Dattran_27 Start: 21656, Stop: 22744, Start Num: 16
Candidate Starts for Dattran_27:
(9, 21593), (10, 21605), (Start: 16 @21656 has 37 MA's), (19, 21734), (20, 21740), (33, 21896), (37, 21935), (42, 22061), (50, 22157), (56, 22256), (57, 22265), (59, 22337), (67, 22481), (78, 22601), (80, 22637),

Gene: Dwayne_25 Start: 21081, Stop: 22169, Start Num: 16
Candidate Starts for Dwayne_25:
(Start: 16 @21081 has 37 MA's), (19, 21159), (20, 21165), (33, 21321), (37, 21360), (42, 21486), (50, 21582), (56, 21681), (57, 21690), (59, 21762), (67, 21906), (71, 21942), (80, 22062),

Gene: Ejemplo_25 Start: 21116, Stop: 22204, Start Num: 16
Candidate Starts for Ejemplo_25:
(Start: 16 @21116 has 37 MA's), (19, 21194), (20, 21200), (33, 21356), (37, 21395), (42, 21521), (50, 21617), (56, 21716), (57, 21725), (59, 21794), (67, 21941), (71, 21977), (80, 22097),

Gene: Emaanora_27 Start: 21039, Stop: 22127, Start Num: 16
Candidate Starts for Emaanora_27:
(Start: 16 @21039 has 37 MA's), (19, 21117), (20, 21123), (33, 21279), (37, 21318), (42, 21444), (50, 21540), (56, 21639), (57, 21648), (59, 21720), (67, 21864), (71, 21900), (80, 22020),

Gene: Fudan_187 Start: 94435, Stop: 95508, Start Num: 15
Candidate Starts for Fudan_187:
(Start: 15 @94435 has 10 MA's), (32, 94651), (37, 94714), (43, 94843), (50, 94927), (56, 95026), (75, 95323), (82, 95473),

Gene: Galactica_29 Start: 23278, Stop: 24240, Start Num: 15
Candidate Starts for Galactica_29:

(2, 22987), (4, 23056), (Start: 15 @23278 has 10 MA's), (19, 23356), (24, 23395), (25, 23401), (33, 23518), (47, 23755), (53, 23860), (75, 24055),

Gene: Garnacho_177 Start: 94205, Stop: 95284, Start Num: 15
Candidate Starts for Garnacho_177:
(Start: 15 @94205 has 10 MA's), (22, 94298), (23, 94301), (32, 94421), (35, 94463), (43, 94613), (50, 94697), (60, 94913), (66, 95030), (75, 95099), (76, 95114),

Gene: GiJojo_177 Start: 95573, Stop: 96496, Start Num: 15
Candidate Starts for GiJojo_177:
(5, 95438), (Start: 15 @95573 has 10 MA's), (20, 95657), (37, 95852), (39, 95870), (56, 96170), (65, 96242), (72, 96278), (75, 96311), (82, 96461), (83, 96482),

Gene: Goby_26 Start: 21661, Stop: 22749, Start Num: 16
Candidate Starts for Goby_26:
(Start: 16 @21661 has 37 MA's), (19, 21739), (20, 21745), (33, 21901), (42, 22066), (50, 22162), (56, 22261), (57, 22270), (59, 22342), (67, 22486), (71, 22522), (78, 22606), (80, 22642),

Gene: Godpower_27 Start: 21654, Stop: 22748, Start Num: 16
Candidate Starts for Godpower_27:
(Start: 16 @21654 has 37 MA's), (19, 21732), (20, 21738), (33, 21894), (42, 22059), (50, 22155), (56, 22254), (57, 22263), (59, 22341), (67, 22485), (71, 22521), (78, 22605), (80, 22641),

Gene: Hippo_25 Start: 21090, Stop: 22178, Start Num: 16
Candidate Starts for Hippo_25:
(Start: 16 @21090 has 37 MA's), (19, 21168), (20, 21174), (33, 21330), (37, 21369), (42, 21495), (50, 21591), (56, 21690), (57, 21699), (59, 21771), (67, 21915), (71, 21951), (80, 22071),

Gene: Hiyaa_30 Start: 24308, Stop: 25282, Start Num: 15
Candidate Starts for Hiyaa_30:
(7, 24230), (13, 24299), (Start: 15 @24308 has 10 MA's), (19, 24386), (28, 24473), (34, 24554), (37, 24587), (44, 24758), (47, 24797), (49, 24845), (55, 24935), (58, 24971), (77, 25118), (79, 25157),

Gene: Itza_28 Start: 21901, Stop: 22887, Start Num: 16
Candidate Starts for Itza_28:
(Start: 16 @21901 has 37 MA's), (19, 21979), (20, 21985), (27, 22060), (29, 22069), (35, 22159), (46, 22351), (48, 22393), (50, 22399),

Gene: Katalie_26 Start: 21379, Stop: 22464, Start Num: 16
Candidate Starts for Katalie_26:
(Start: 16 @21379 has 37 MA's), (19, 21457), (20, 21463), (35, 21637), (42, 21784), (50, 21880), (56, 21979), (57, 21988), (59, 22054), (67, 22201), (78, 22321), (80, 22357),

Gene: Keanu_31 Start: 24375, Stop: 25334, Start Num: 15
Candidate Starts for Keanu_31:
(1, 24078), (3, 24153), (4, 24156), (6, 24267), (Start: 15 @24375 has 10 MA's), (19, 24453), (24, 24492), (33, 24615), (37, 24654), (44, 24813), (53, 24957), (74, 25143), (75, 25149), (77, 25170),

Gene: KimJongPhill_37 Start: 33176, Stop: 32256, Start Num: 14
Candidate Starts for KimJongPhill_37:
(8, 33242), (12, 33209), (Start: 14 @33176 has 2 MA's), (19, 33089), (33, 32927), (35, 32909), (40, 32822), (41, 32774), (45, 32726), (50, 32666), (51, 32633), (52, 32621), (54, 32603), (56, 32567), (63, 32516), (73, 32441), (76, 32417), (81, 32345), (84, 32270),

Gene: Kokushibo_32 Start: 24323, Stop: 25297, Start Num: 15
Candidate Starts for Kokushibo_32:
(7, 24245), (13, 24314), (Start: 15 @24323 has 10 MA's), (19, 24401), (28, 24488), (34, 24569), (37, 24602), (44, 24773), (47, 24812), (49, 24860), (55, 24950), (58, 24986), (77, 25133), (79, 25172),

Gene: Lika_26 Start: 21658, Stop: 22752, Start Num: 16
Candidate Starts for Lika_26:
(Start: 16 @21658 has 37 MA's), (19, 21736), (20, 21742), (33, 21898), (42, 22063), (50, 22159), (56, 22258), (57, 22267), (59, 22345), (67, 22489), (71, 22525), (78, 22609), (80, 22645),

Gene: Lorelei_26 Start: 21627, Stop: 22721, Start Num: 16
Candidate Starts for Lorelei_26:
(10, 21576), (Start: 16 @21627 has 37 MA's), (19, 21705), (20, 21711), (33, 21867), (42, 22032), (50, 22128), (56, 22227), (57, 22236), (59, 22311), (67, 22458), (71, 22494), (78, 22578), (80, 22614),

Gene: LuckySocke_185 Start: 94376, Stop: 95449, Start Num: 15
Candidate Starts for LuckySocke_185:
(Start: 15 @94376 has 10 MA's), (32, 94592), (37, 94655), (43, 94784), (50, 94868), (56, 94967), (75, 95264), (82, 95414),

Gene: Maneekul_25 Start: 21115, Stop: 22203, Start Num: 16
Candidate Starts for Maneekul_25:
(Start: 16 @21115 has 37 MA's), (19, 21193), (20, 21199), (33, 21355), (37, 21394), (42, 21520), (50, 21616), (56, 21715), (57, 21724), (59, 21793), (62, 21895), (67, 21940), (71, 21976), (80, 22096),

Gene: Nabi_26 Start: 21627, Stop: 22721, Start Num: 16
Candidate Starts for Nabi_26:
(10, 21576), (Start: 16 @21627 has 37 MA's), (19, 21705), (20, 21711), (33, 21867), (42, 22032), (50, 22128), (56, 22227), (57, 22236), (59, 22311), (67, 22458), (71, 22494), (78, 22578), (80, 22614),

Gene: OzzyJ_26 Start: 21081, Stop: 22169, Start Num: 16
Candidate Starts for OzzyJ_26:
(Start: 16 @21081 has 37 MA's), (19, 21159), (20, 21165), (33, 21321), (37, 21360), (42, 21486), (50, 21582), (56, 21681), (57, 21690), (59, 21762), (67, 21906), (71, 21942), (80, 22062),

Gene: Park1214_197 Start: 96200, Stop: 97279, Start Num: 15
Candidate Starts for Park1214_197:
(Start: 15 @96200 has 10 MA's), (37, 96479), (43, 96608), (50, 96692), (53, 96743), (75, 97094),

Gene: Rana_26 Start: 21627, Stop: 22721, Start Num: 16
Candidate Starts for Rana_26:
(10, 21576), (Start: 16 @21627 has 37 MA's), (19, 21705), (20, 21711), (33, 21867), (42, 22032), (50, 22128), (56, 22227), (57, 22236), (59, 22311), (67, 22458), (71, 22494), (78, 22578), (80, 22614),

Gene: RedBear_27 Start: 21379, Stop: 22464, Start Num: 16
Candidate Starts for RedBear_27:
(Start: 16 @21379 has 37 MA's), (19, 21457), (20, 21463), (35, 21637), (42, 21784), (50, 21880), (56, 21979), (57, 21988), (59, 22054), (67, 22201), (78, 22321), (80, 22357),

Gene: SarahRose_25 Start: 21090, Stop: 22178, Start Num: 16
Candidate Starts for SarahRose_25:

(Start: 16 @21090 has 37 MA's), (19, 21168), (20, 21174), (33, 21330), (37, 21369), (42, 21495), (50, 21591), (56, 21690), (57, 21699), (59, 21771), (67, 21915), (71, 21951), (80, 22071),

Gene: Snorlax_25 Start: 21093, Stop: 22181, Start Num: 16
Candidate Starts for Snorlax_25:
(Start: 16 @21093 has 37 MA's), (19, 21171), (20, 21177), (33, 21333), (42, 21498), (50, 21594), (56, 21693), (57, 21702), (59, 21774), (67, 21918), (71, 21954), (80, 22074),

Gene: South40_26 Start: 21379, Stop: 22464, Start Num: 16
Candidate Starts for South40_26:
(Start: 16 @21379 has 37 MA's), (19, 21457), (20, 21463), (35, 21637), (42, 21784), (50, 21880), (56, 21979), (57, 21988), (59, 22054), (67, 22201), (78, 22321), (80, 22357),

Gene: Spocter_30 Start: 24296, Stop: 25270, Start Num: 15
Candidate Starts for Spocter_30:
(7, 24218), (13, 24287), (Start: 15 @24296 has 10 MA's), (19, 24374), (28, 24461), (34, 24542), (37, 24575), (44, 24746), (47, 24785), (49, 24833), (55, 24923), (58, 24959), (77, 25106), (79, 25145),

Gene: Sujidade_27 Start: 21949, Stop: 23037, Start Num: 16
Candidate Starts for Sujidade_27:
(Start: 16 @21949 has 37 MA's), (19, 22027), (20, 22033), (33, 22189), (42, 22354), (50, 22450), (56, 22549), (59, 22630), (67, 22774), (71, 22810), (78, 22894), (80, 22930),

Gene: Superstar_29 Start: 22840, Stop: 23736, Start Num: 17
Candidate Starts for Superstar_29:
(11, 22789), (17, 22840), (18, 22912), (21, 22927), (30, 23017), (33, 23059), (36, 23092), (44, 23224), (50, 23296), (69, 23485),

Gene: TagePhighter_26 Start: 21093, Stop: 22181, Start Num: 16
Candidate Starts for TagePhighter_26:
(Start: 16 @21093 has 37 MA's), (19, 21171), (20, 21177), (33, 21333), (42, 21498), (50, 21594), (56, 21693), (57, 21702), (59, 21774), (67, 21918), (71, 21954), (80, 22074),

Gene: Talos_187 Start: 94395, Stop: 95468, Start Num: 15
Candidate Starts for Talos_187:
(Start: 15 @94395 has 10 MA's), (32, 94611), (37, 94674), (43, 94803), (50, 94887), (56, 94986), (75, 95283), (82, 95433),

Gene: Toma_26 Start: 21661, Stop: 22749, Start Num: 16
Candidate Starts for Toma_26:
(Start: 16 @21661 has 37 MA's), (19, 21739), (20, 21745), (33, 21901), (42, 22066), (50, 22162), (56, 22261), (57, 22270), (59, 22342), (67, 22486), (71, 22522), (78, 22606), (80, 22642),

Gene: Triste_25 Start: 21081, Stop: 22169, Start Num: 16
Candidate Starts for Triste_25:
(Start: 16 @21081 has 37 MA's), (19, 21159), (20, 21165), (33, 21321), (42, 21486), (50, 21582), (56, 21681), (57, 21690), (59, 21762), (67, 21906), (71, 21942), (80, 22062),

Gene: TuanPN_25 Start: 21116, Stop: 22204, Start Num: 16
Candidate Starts for TuanPN_25:
(Start: 16 @21116 has 37 MA's), (19, 21194), (20, 21200), (33, 21356), (37, 21395), (42, 21521), (50, 21617), (56, 21716), (57, 21725), (59, 21794), (67, 21941), (71, 21977), (80, 22097),

Gene: Urza_28 Start: 21922, Stop: 22908, Start Num: 16
Candidate Starts for Urza_28:
(Start: 16 @21922 has 37 MA's), (19, 22000), (20, 22006), (27, 22081), (29, 22090), (35, 22180), (46, 22372), (48, 22414), (50, 22420),

Gene: VieEnRose_28 Start: 21828, Stop: 22976, Start Num: 16
Candidate Starts for VieEnRose_28:
(Start: 16 @21828 has 37 MA's), (19, 21906), (20, 21912), (27, 21987), (29, 21996), (33, 22068), (35, 22086), (41, 22221), (46, 22278), (48, 22320), (50, 22326), (53, 22377), (61, 22560), (68, 22707),

Gene: Werner_25 Start: 21091, Stop: 22179, Start Num: 16
Candidate Starts for Werner_25:
(Start: 16 @21091 has 37 MA's), (19, 21169), (20, 21175), (33, 21331), (42, 21496), (50, 21592), (56, 21691), (57, 21700), (59, 21772), (67, 21916), (71, 21952), (80, 22072),

Gene: Whatever_25 Start: 21091, Stop: 22179, Start Num: 16
Candidate Starts for Whatever_25:
(Start: 16 @21091 has 37 MA's), (19, 21169), (20, 21175), (33, 21331), (42, 21496), (50, 21592), (56, 21691), (57, 21700), (59, 21772), (67, 21916), (71, 21952), (80, 22072),

Gene: Yasdnil_25 Start: 21112, Stop: 22200, Start Num: 16
Candidate Starts for Yasdnil_25:
(Start: 16 @21112 has 37 MA's), (19, 21190), (20, 21196), (33, 21352), (37, 21391), (42, 21517), (50, 21613), (56, 21712), (57, 21721), (59, 21790), (67, 21937), (71, 21973), (80, 22093),

Gene: Zemlya_27 Start: 21653, Stop: 22741, Start Num: 16
Candidate Starts for Zemlya_27:
(9, 21590), (10, 21602), (Start: 16 @21653 has 37 MA's), (19, 21731), (20, 21737), (33, 21893), (37, 21932), (42, 22058), (50, 22154), (56, 22253), (57, 22262), (59, 22334), (67, 22478), (78, 22598), (80, 22634),

Gene: Zuko_35 Start: 31679, Stop: 30726, Start Num: 14
Candidate Starts for Zuko_35:
(8, 31745), (12, 31712), (Start: 14 @31679 has 2 MA's), (19, 31592), (21, 31580), (26, 31508), (31, 31460), (35, 31397), (41, 31262), (42, 31250), (45, 31214), (50, 31151), (54, 31088), (73, 30911), (81, 30815), (84, 30740),