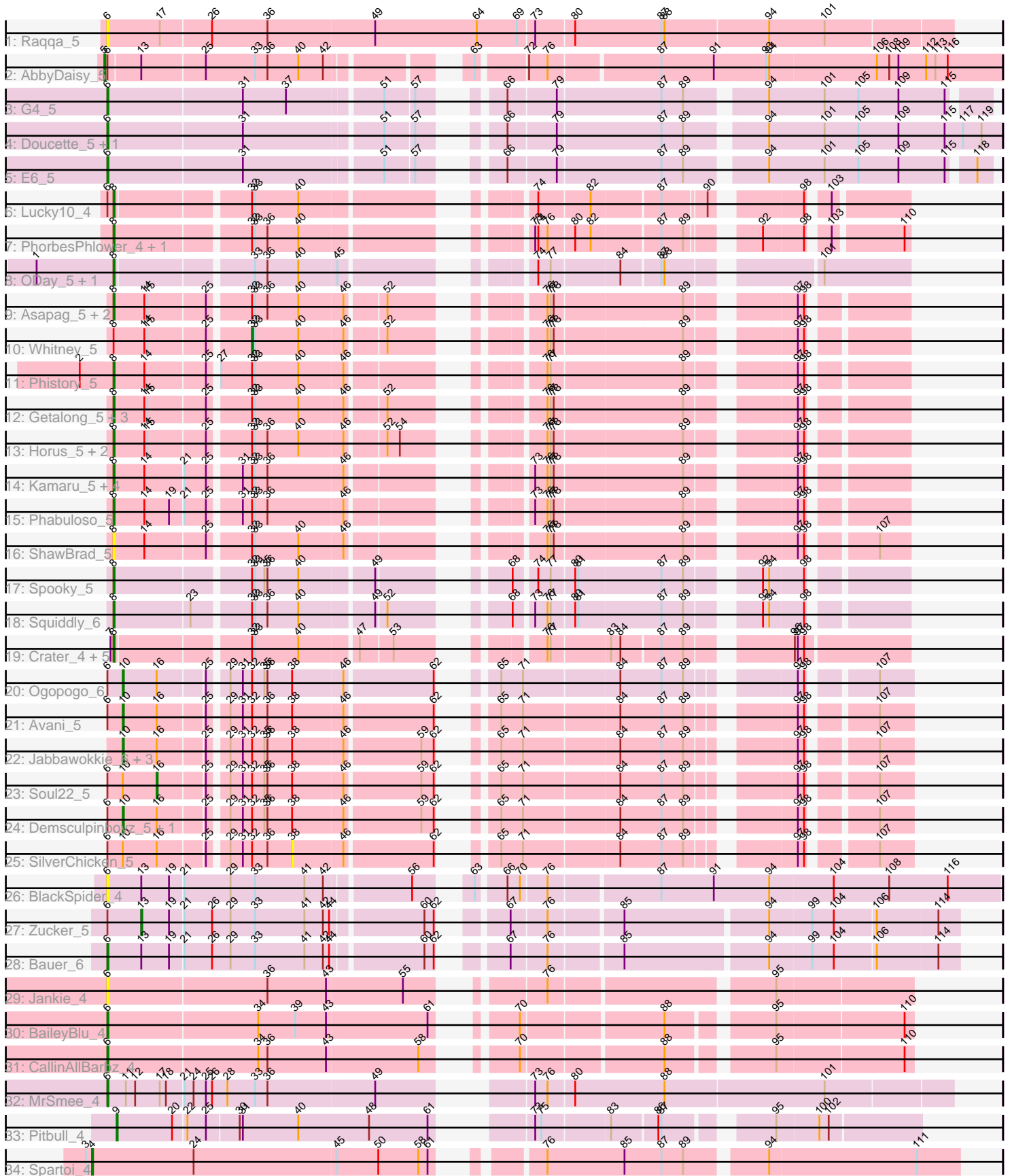


Pham 216205



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 216205 Report

This analysis was run 02/22/25 on database version 588.

Pham number 216205 has 57 members, 9 are drafts.

Phages represented in each track:

- Track 1 : Raqqa\_5
- Track 2 : AbbyDaisy\_5
- Track 3 : G4\_5
- Track 4 : Doucette\_5, B22\_5
- Track 5 : E6\_5
- Track 6 : Lucky10\_4
- Track 7 : PhorbesPhlower\_4, Morkie\_4
- Track 8 : ODay\_5, Ecliptus\_5
- Track 9 : Asapag\_5, BotCity\_5, BENtherdunthat\_5
- Track 10 : Whitney\_5
- Track 11 : Phistory\_5
- Track 12 : Getalong\_5, Lutum\_5, Kenna\_5, Periwinkle\_5
- Track 13 : Horus\_5, Leroy\_5, Frickyeh\_5
- Track 14 : Kamaru\_5, Budski\_5, CheeseTouch\_5, LitninMcQueen\_5, Holliday\_5
- Track 15 : Phabuloso\_5
- Track 16 : ShawBrad\_5
- Track 17 : Spooky\_5
- Track 18 : Squiddly\_6
- Track 19 : Crater\_4, Apricot\_4, BearBQ\_4, Kuwabara\_4, MortyNRick\_4, Birdsong\_4
- Track 20 : Ogopogo\_6
- Track 21 : Avani\_5
- Track 22 : Jabbawokkie\_6, Zapner\_6, Che9d\_5, Yoshi\_5
- Track 23 : Soul22\_5
- Track 24 : Demsculpinboyz\_5, Blarby\_6
- Track 25 : SilverChicken\_5
- Track 26 : BlackSpider\_4
- Track 27 : Zucker\_5
- Track 28 : Bauer\_6
- Track 29 : Jankie\_4
- Track 30 : BaileyBlu\_4
- Track 31 : CallinAllBarbz\_4
- Track 32 : MrSmee\_4
- Track 33 : Pitbull\_4
- Track 34 : Spartoi\_4

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

The start number called the most often in the published annotations is 8, it was called in 27 of the 48 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Apricot\_4, Asapag\_5, BENtherdunthat\_5, BearBQ\_4, Birdsong\_4, BotCity\_5, Budski\_5, CheeseTouch\_5, Crater\_4, Ecliptus\_5, Frickyeah\_5, Getalong\_5, Holliday\_5, Horus\_5, Kamaru\_5, Kenna\_5, Kuwabara\_4, Leroy\_5, LitninMcQueen\_5, Lucky10\_4, Lutum\_5, Morkie\_4, MortyNRick\_4, ODay\_5, Periwinkle\_5, Phabuloso\_5, Phistory\_5, PhorbesPhlower\_4, ShawBrad\_5, Spooky\_5, Squiddly\_6,

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

- Whitney\_5,

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

- AbbyDaisy\_5, Avani\_5, B22\_5, BaileyBlu\_4, Bauer\_6, BlackSpider\_4, Blarby\_6, CallinAllBarbz\_4, Che9d\_5, Demsculpinboyz\_5, Doucette\_5, E6\_5, G4\_5, Jabbawokkie\_6, Jankie\_4, MrSmee\_4, Ogopogo\_6, Pitbull\_4, Raqqa\_5, SilverChicken\_5, Soul22\_5, Spartoi\_4, Yoshi\_5, Zapner\_6, Zucker\_5,

### **Summary by start number:**

Start 4:

- Found in 1 of 57 ( 1.8% ) of genes in pham
- Manual Annotations of this start: 1 of 48
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Spartoi\_4 (singleton),

Start 5:

- Found in 1 of 57 ( 1.8% ) of genes in pham
- Manual Annotations of this start: 1 of 48
- Called 100.0% of time when present
- Phage (with cluster) where this start called: AbbyDaisy\_5 (AY),

Start 6:

- Found in 20 of 57 ( 35.1% ) of genes in pham
- Manual Annotations of this start: 8 of 48
- Called 55.0% of time when present
- Phage (with cluster) where this start called: B22\_5 (BW), BaileyBlu\_4 (FP), Bauer\_6 (FN), BlackSpider\_4 (FN), CallinAllBarbz\_4 (FP), Doucette\_5 (BW), E6\_5 (BW), G4\_5 (BW), Jankie\_4 (FP), MrSmee\_4 (FQ), Raqqa\_5 (AY),

Start 8:

- Found in 32 of 57 ( 56.1% ) of genes in pham
- Manual Annotations of this start: 27 of 48
- Called 96.9% of time when present
- Phage (with cluster) where this start called: Apricot\_4 (DN3), Asapag\_5 (DN1), BENtherdunthat\_5 (DN1), BearBQ\_4 (DN), Birdsong\_4 (DN), BotCity\_5 (DN), Budski\_5 (DN), CheeseTouch\_5 (DN1), Crater\_4 (DN3), Ecliptus\_5 (DN), Frickyeah\_5 (DN1), Getalong\_5 (DN1), Holliday\_5 (DN1), Horus\_5 (DN1), Kamaru\_5 (DN1), Kenna\_5 (DN1), Kuwabara\_4 (DN4), Leroy\_5 (DN1), LitninMcQueen\_5 (DN1),

Lucky10\_4 (DH), Lutum\_5 (DN1), Morkie\_4 (DH), MortyNRick\_4 (DN), ODay\_5 (DN), Periwinkle\_5 (DN1), Phabuloso\_5 (DN1), Phistory\_5 (DN1), PhorbesPhlower\_4 (DH), ShawBrad\_5 (DN1), Spooky\_5 (DN2), Squiddly\_6 (DN2),

Start 9:

- Found in 1 of 57 ( 1.8% ) of genes in pham
- Manual Annotations of this start: 1 of 48
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Pitbull\_4 (FQ),

Start 10:

- Found in 10 of 57 ( 17.5% ) of genes in pham
- Manual Annotations of this start: 7 of 48
- Called 80.0% of time when present
- Phage (with cluster) where this start called: Avani\_5 (F2), Blarby\_6 (F), Che9d\_5 (F2), Demsculpinboyz\_5 (F2), Jabbawokkie\_6 (F2), Ogopogo\_6 (F1), Yoshi\_5 (F2), Zapner\_6 (F2),

Start 13:

- Found in 4 of 57 ( 7.0% ) of genes in pham
- Manual Annotations of this start: 1 of 48
- Called 25.0% of time when present
- Phage (with cluster) where this start called: Zucker\_5 (FN),

Start 16:

- Found in 10 of 57 ( 17.5% ) of genes in pham
- Manual Annotations of this start: 1 of 48
- Called 10.0% of time when present
- Phage (with cluster) where this start called: Soul22\_5 (F2),

Start 32:

- Found in 40 of 57 ( 70.2% ) of genes in pham
- Manual Annotations of this start: 1 of 48
- Called 2.5% of time when present
- Phage (with cluster) where this start called: Whitney\_5 (DN1),

Start 38:

- Found in 10 of 57 ( 17.5% ) of genes in pham
- No Manual Annotations of this start.
- Called 10.0% of time when present
- Phage (with cluster) where this start called: SilverChicken\_5 (F2),

### **Summary by clusters:**

There are 15 clusters represented in this pham: DN, FP, F2, DH, FQ, F, singleton, F1, DN4, BW, DN1, DN3, DN2, AY, FN,

Info for manual annotations of cluster AY:

- Start number 5 was manually annotated 1 time for cluster AY.

Info for manual annotations of cluster BW:

- Start number 6 was manually annotated 4 times for cluster BW.

Info for manual annotations of cluster DH:

- Start number 8 was manually annotated 3 times for cluster DH.

Info for manual annotations of cluster DN:

- Start number 8 was manually annotated 5 times for cluster DN.

Info for manual annotations of cluster DN1:

- Start number 8 was manually annotated 14 times for cluster DN1.
- Start number 32 was manually annotated 1 time for cluster DN1.

Info for manual annotations of cluster DN2:

- Start number 8 was manually annotated 2 times for cluster DN2.

Info for manual annotations of cluster DN3:

- Start number 8 was manually annotated 2 times for cluster DN3.

Info for manual annotations of cluster DN4:

- Start number 8 was manually annotated 1 time for cluster DN4.

Info for manual annotations of cluster F1:

- Start number 10 was manually annotated 1 time for cluster F1.

Info for manual annotations of cluster F2:

- Start number 10 was manually annotated 6 times for cluster F2.
- Start number 16 was manually annotated 1 time for cluster F2.

Info for manual annotations of cluster FN:

- Start number 6 was manually annotated 1 time for cluster FN.
- Start number 13 was manually annotated 1 time for cluster FN.

Info for manual annotations of cluster FP:

- Start number 6 was manually annotated 2 times for cluster FP.

Info for manual annotations of cluster FQ:

- Start number 6 was manually annotated 1 time for cluster FQ.
- Start number 9 was manually annotated 1 time for cluster FQ.

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

Gene: AbbyDaisy\_5 Start: 3558, Stop: 4358, Start Num: 5

Candidate Starts for AbbyDaisy\_5:

(Start: 5 @3558 has 1 MA's), (Start: 6 @3561 has 8 MA's), (Start: 13 @3591 has 1 MA's), (25, 3651), (33, 3699), (36, 3711), (40, 3741), (42, 3765), (63, 3867), (72, 3909), (76, 3927), (87, 4029), (91, 4080), (93, 4131), (94, 4134), (106, 4236), (108, 4248), (109, 4257), (112, 4284), (113, 4293), (116, 4305),

Gene: Apricot\_4 Start: 3576, Stop: 4232, Start Num: 8

Candidate Starts for Apricot\_4:

(7, 3573), (Start: 8 @3576 has 27 MA's), (Start: 32 @3696 has 1 MA's), (33, 3699), (40, 3741), (47, 3792), (53, 3822), (76, 3918), (77, 3921), (83, 3975), (84, 3984), (87, 4020), (89, 4041), (96, 4125), (97, 4128), (98, 4134),

Gene: Asapag\_5 Start: 3599, Stop: 4243, Start Num: 8

Candidate Starts for Asapag\_5:

(Start: 8 @3599 has 27 MA's), (14, 3629), (15, 3632), (25, 3686), (Start: 32 @3722 has 1 MA's), (33, 3725), (36, 3737), (40, 3767), (46, 3809), (52, 3842), (76, 3944), (77, 3947), (78, 3950), (89, 4070), (97, 4154), (98, 4160),

Gene: Avani\_5 Start: 3585, Stop: 4229, Start Num: 10

Candidate Starts for Avani\_5:

(Start: 6 @3570 has 8 MA's), (Start: 10 @3585 has 7 MA's), (Start: 16 @3618 has 1 MA's), (25, 3660), (29, 3675), (31, 3687), (Start: 32 @3696 has 1 MA's), (36, 3711), (38, 3735), (46, 3783), (62, 3864), (65, 3885), (71, 3906), (84, 3996), (87, 4035), (89, 4056), (97, 4137), (98, 4143), (107, 4197),

Gene: B22\_5 Start: 3905, Stop: 4687, Start Num: 6

Candidate Starts for B22\_5:

(Start: 6 @3905 has 8 MA's), (31, 4034), (51, 4157), (57, 4184), (66, 4229), (79, 4274), (87, 4373), (89, 4394), (94, 4460), (101, 4514), (105, 4547), (109, 4586), (115, 4631), (117, 4649), (119, 4667),

Gene: BENtherdunthat\_5 Start: 3599, Stop: 4243, Start Num: 8

Candidate Starts for BENtherdunthat\_5:

(Start: 8 @3599 has 27 MA's), (14, 3629), (15, 3632), (25, 3686), (Start: 32 @3722 has 1 MA's), (33, 3725), (36, 3737), (40, 3767), (46, 3809), (52, 3842), (76, 3944), (77, 3947), (78, 3950), (89, 4070), (97, 4154), (98, 4160),

Gene: BaileyBlu\_4 Start: 3397, Stop: 4089, Start Num: 6

Candidate Starts for BaileyBlu\_4:

(Start: 6 @3397 has 8 MA's), (34, 3541), (39, 3577), (43, 3607), (61, 3703), (70, 3745), (88, 3874), (95, 3961), (110, 4081),

Gene: Bauer\_6 Start: 4443, Stop: 5192, Start Num: 6

Candidate Starts for Bauer\_6:

(Start: 6 @4443 has 8 MA's), (Start: 13 @4476 has 1 MA's), (19, 4503), (21, 4515), (26, 4542), (29, 4560), (33, 4584), (41, 4632), (42, 4650), (44, 4656), (60, 4737), (62, 4746), (67, 4785), (76, 4818), (85, 4884), (94, 5016), (99, 5055), (104, 5076), (106, 5115), (114, 5172),

Gene: BearBQ\_4 Start: 3576, Stop: 4232, Start Num: 8

Candidate Starts for BearBQ\_4:

(7, 3573), (Start: 8 @3576 has 27 MA's), (Start: 32 @3696 has 1 MA's), (33, 3699), (40, 3741), (47, 3792), (53, 3822), (76, 3918), (77, 3921), (83, 3975), (84, 3984), (87, 4020), (89, 4041), (96, 4125), (97, 4128), (98, 4134),

Gene: Birdsong\_4 Start: 3576, Stop: 4232, Start Num: 8

Candidate Starts for Birdsong\_4:

(7, 3573), (Start: 8 @3576 has 27 MA's), (Start: 32 @3696 has 1 MA's), (33, 3699), (40, 3741), (47, 3792), (53, 3822), (76, 3918), (77, 3921), (83, 3975), (84, 3984), (87, 4020), (89, 4041), (96, 4125), (97, 4128), (98, 4134),

Gene: BlackSpider\_4 Start: 3452, Stop: 4255, Start Num: 6

Candidate Starts for BlackSpider\_4:

(Start: 6 @3452 has 8 MA's), (Start: 13 @3485 has 1 MA's), (19, 3512), (21, 3524), (29, 3569), (33, 3593), (41, 3641), (42, 3659), (56, 3734), (63, 3767), (66, 3791), (70, 3803), (76, 3827), (87, 3929), (91, 3980), (94, 4034), (104, 4094), (108, 4148), (116, 4205),

Gene: Blarby\_6 Start: 4110, Stop: 4754, Start Num: 10

Candidate Starts for Blarby\_6:

(Start: 6 @4095 has 8 MA's), (Start: 10 @4110 has 7 MA's), (Start: 16 @4143 has 1 MA's), (25, 4185), (29, 4200), (31, 4212), (Start: 32 @4221 has 1 MA's), (35, 4233), (36, 4236), (38, 4260), (46, 4308), (59, 4377), (62, 4389), (65, 4410), (71, 4431), (84, 4521), (87, 4560), (89, 4581), (97, 4662), (98, 4668), (107, 4722),

Gene: BotCity\_5 Start: 3597, Stop: 4241, Start Num: 8

Candidate Starts for BotCity\_5:

(Start: 8 @3597 has 27 MA's), (14, 3627), (15, 3630), (25, 3684), (Start: 32 @3720 has 1 MA's), (33, 3723), (36, 3735), (40, 3765), (46, 3807), (52, 3840), (76, 3942), (77, 3945), (78, 3948), (89, 4068), (97, 4152), (98, 4158),

Gene: Budski\_5 Start: 3597, Stop: 4241, Start Num: 8

Candidate Starts for Budski\_5:

(Start: 8 @3597 has 27 MA's), (14, 3627), (21, 3663), (25, 3684), (31, 3711), (Start: 32 @3720 has 1 MA's), (33, 3723), (36, 3735), (46, 3807), (73, 3930), (76, 3942), (77, 3945), (78, 3948), (89, 4068), (97, 4152), (98, 4158),

Gene: CallinAllBarbz\_4 Start: 3399, Stop: 4091, Start Num: 6

Candidate Starts for CallinAllBarbz\_4:

(Start: 6 @3399 has 8 MA's), (34, 3543), (36, 3552), (43, 3609), (58, 3696), (70, 3747), (88, 3876), (95, 3963), (110, 4083),

Gene: Che9d\_5 Start: 3595, Stop: 4239, Start Num: 10

Candidate Starts for Che9d\_5:

(Start: 10 @3595 has 7 MA's), (Start: 16 @3628 has 1 MA's), (25, 3670), (29, 3685), (31, 3697), (Start: 32 @3706 has 1 MA's), (35, 3718), (36, 3721), (38, 3745), (46, 3793), (59, 3862), (62, 3874), (65, 3895), (71, 3916), (84, 4006), (87, 4045), (89, 4066), (97, 4147), (98, 4153), (107, 4207),

Gene: CheeseTouch\_5 Start: 3597, Stop: 4241, Start Num: 8

Candidate Starts for CheeseTouch\_5:

(Start: 8 @3597 has 27 MA's), (14, 3627), (21, 3663), (25, 3684), (31, 3711), (Start: 32 @3720 has 1 MA's), (33, 3723), (36, 3735), (46, 3807), (73, 3930), (76, 3942), (77, 3945), (78, 3948), (89, 4068), (97, 4152), (98, 4158),

Gene: Crater\_4 Start: 3576, Stop: 4232, Start Num: 8

Candidate Starts for Crater\_4:

(7, 3573), (Start: 8 @3576 has 27 MA's), (Start: 32 @3696 has 1 MA's), (33, 3699), (40, 3741), (47, 3792), (53, 3822), (76, 3918), (77, 3921), (83, 3975), (84, 3984), (87, 4020), (89, 4041), (96, 4125), (97, 4128), (98, 4134),

Gene: Demsculpinboyz\_5 Start: 3586, Stop: 4230, Start Num: 10

Candidate Starts for Demsculpinboyz\_5:

(Start: 6 @3571 has 8 MA's), (Start: 10 @3586 has 7 MA's), (Start: 16 @3619 has 1 MA's), (25, 3661), (29, 3676), (31, 3688), (Start: 32 @3697 has 1 MA's), (35, 3709), (36, 3712), (38, 3736), (46, 3784), (59, 3853), (62, 3865), (65, 3886), (71, 3907), (84, 3997), (87, 4036), (89, 4057), (97, 4138), (98, 4144), (107, 4198),

Gene: Doucette\_5 Start: 3905, Stop: 4690, Start Num: 6

Candidate Starts for Doucette\_5:

(Start: 6 @3905 has 8 MA's), (31, 4034), (51, 4160), (57, 4187), (66, 4232), (79, 4277), (87, 4376), (89, 4397), (94, 4463), (101, 4517), (105, 4550), (109, 4589), (115, 4634), (117, 4652), (119, 4670),

Gene: E6\_5 Start: 3906, Stop: 4670, Start Num: 6

Candidate Starts for E6\_5:

(Start: 6 @3906 has 8 MA's), (31, 4035), (51, 4161), (57, 4188), (66, 4233), (79, 4278), (87, 4377), (89, 4398), (94, 4464), (101, 4518), (105, 4551), (109, 4590), (115, 4635), (118, 4656),

Gene: Ecliptus\_5 Start: 3608, Stop: 4267, Start Num: 8

Candidate Starts for Ecliptus\_5:

(1, 3533), (Start: 8 @3608 has 27 MA's), (33, 3731), (36, 3743), (40, 3773), (45, 3809), (74, 3944), (77, 3956), (84, 4019), (87, 4055), (88, 4058), (101, 4184),

Gene: Frickyeah\_5 Start: 3599, Stop: 4243, Start Num: 8

Candidate Starts for Frickyeah\_5:

(Start: 8 @3599 has 27 MA's), (14, 3629), (15, 3632), (25, 3686), (Start: 32 @3722 has 1 MA's), (33, 3725), (36, 3737), (40, 3767), (46, 3809), (52, 3842), (54, 3854), (76, 3944), (77, 3947), (78, 3950), (89, 4070), (97, 4154), (98, 4160),

Gene: G4\_5 Start: 3905, Stop: 4669, Start Num: 6

Candidate Starts for G4\_5:

(Start: 6 @3905 has 8 MA's), (31, 4034), (37, 4076), (51, 4160), (57, 4187), (66, 4232), (79, 4277), (87, 4376), (89, 4397), (94, 4463), (101, 4517), (105, 4550), (109, 4589), (115, 4634),

Gene: Getalong\_5 Start: 3599, Stop: 4243, Start Num: 8

Candidate Starts for Getalong\_5:

(Start: 8 @3599 has 27 MA's), (14, 3629), (15, 3632), (25, 3686), (Start: 32 @3722 has 1 MA's), (33, 3725), (40, 3767), (46, 3809), (52, 3842), (76, 3944), (77, 3947), (78, 3950), (89, 4070), (97, 4154), (98, 4160),

Gene: Holliday\_5 Start: 3597, Stop: 4241, Start Num: 8

Candidate Starts for Holliday\_5:

(Start: 8 @3597 has 27 MA's), (14, 3627), (21, 3663), (25, 3684), (31, 3711), (Start: 32 @3720 has 1 MA's), (33, 3723), (36, 3735), (46, 3807), (73, 3930), (76, 3942), (77, 3945), (78, 3948), (89, 4068), (97, 4152), (98, 4158),

Gene: Horus\_5 Start: 3599, Stop: 4243, Start Num: 8

Candidate Starts for Horus\_5:

(Start: 8 @3599 has 27 MA's), (14, 3629), (15, 3632), (25, 3686), (Start: 32 @3722 has 1 MA's), (33, 3725), (36, 3737), (40, 3767), (46, 3809), (52, 3842), (54, 3854), (76, 3944), (77, 3947), (78, 3950), (89, 4070), (97, 4154), (98, 4160),

Gene: Jabbawokkie\_6 Start: 4109, Stop: 4753, Start Num: 10

Candidate Starts for Jabbawokkie\_6:

(Start: 10 @4109 has 7 MA's), (Start: 16 @4142 has 1 MA's), (25, 4184), (29, 4199), (31, 4211), (Start: 32 @4220 has 1 MA's), (35, 4232), (36, 4235), (38, 4259), (46, 4307), (59, 4376), (62, 4388), (65, 4409), (71, 4430), (84, 4520), (87, 4559), (89, 4580), (97, 4661), (98, 4667), (107, 4721),

Gene: Jankie\_4 Start: 3408, Stop: 4106, Start Num: 6

Candidate Starts for Jankie\_4:

(Start: 6 @3408 has 8 MA's), (36, 3561), (43, 3618), (55, 3690), (76, 3780), (95, 3978),

Gene: Kamaru\_5 Start: 3597, Stop: 4241, Start Num: 8

Candidate Starts for Kamaru\_5:



(Start: 8 @3597 has 27 MA's), (14, 3627), (21, 3663), (25, 3684), (31, 3711), (Start: 32 @3720 has 1 MA's), (33, 3723), (36, 3735), (46, 3807), (73, 3930), (76, 3942), (77, 3945), (78, 3948), (89, 4068), (97, 4152), (98, 4158),

Gene: Kenna\_5 Start: 3599, Stop: 4243, Start Num: 8

Candidate Starts for Kenna\_5:

(Start: 8 @3599 has 27 MA's), (14, 3629), (15, 3632), (25, 3686), (Start: 32 @3722 has 1 MA's), (33, 3725), (40, 3767), (46, 3809), (52, 3842), (76, 3944), (77, 3947), (78, 3950), (89, 4070), (97, 4154), (98, 4160),

Gene: Kuwabara\_4 Start: 3576, Stop: 4232, Start Num: 8

Candidate Starts for Kuwabara\_4:

(7, 3573), (Start: 8 @3576 has 27 MA's), (Start: 32 @3696 has 1 MA's), (33, 3699), (40, 3741), (47, 3792), (53, 3822), (76, 3918), (77, 3921), (83, 3975), (84, 3984), (87, 4020), (89, 4041), (96, 4125), (97, 4128), (98, 4134),

Gene: Leroy\_5 Start: 3600, Stop: 4244, Start Num: 8

Candidate Starts for Leroy\_5:

(Start: 8 @3600 has 27 MA's), (14, 3630), (15, 3633), (25, 3687), (Start: 32 @3723 has 1 MA's), (33, 3726), (36, 3738), (40, 3768), (46, 3810), (52, 3843), (54, 3855), (76, 3945), (77, 3948), (78, 3951), (89, 4071), (97, 4155), (98, 4161),

Gene: LitninMcQueen\_5 Start: 3597, Stop: 4241, Start Num: 8

Candidate Starts for LitninMcQueen\_5:

(Start: 8 @3597 has 27 MA's), (14, 3627), (21, 3663), (25, 3684), (31, 3711), (Start: 32 @3720 has 1 MA's), (33, 3723), (36, 3735), (46, 3807), (73, 3930), (76, 3942), (77, 3945), (78, 3948), (89, 4068), (97, 4152), (98, 4158),

Gene: Lucky10\_4 Start: 3151, Stop: 3789, Start Num: 8

Candidate Starts for Lucky10\_4:

(Start: 6 @3145 has 8 MA's), (Start: 8 @3151 has 27 MA's), (Start: 32 @3271 has 1 MA's), (33, 3274), (40, 3316), (74, 3487), (82, 3535), (87, 3598), (90, 3637), (98, 3706), (103, 3721),

Gene: Lutum\_5 Start: 3599, Stop: 4243, Start Num: 8

Candidate Starts for Lutum\_5:

(Start: 8 @3599 has 27 MA's), (14, 3629), (15, 3632), (25, 3686), (Start: 32 @3722 has 1 MA's), (33, 3725), (40, 3767), (46, 3809), (52, 3842), (76, 3944), (77, 3947), (78, 3950), (89, 4070), (97, 4154), (98, 4160),

Gene: Morkie\_4 Start: 3159, Stop: 3800, Start Num: 8

Candidate Starts for Morkie\_4:

(Start: 8 @3159 has 27 MA's), (Start: 32 @3282 has 1 MA's), (33, 3285), (36, 3297), (40, 3327), (73, 3495), (74, 3498), (76, 3507), (80, 3531), (82, 3546), (87, 3609), (89, 3630), (92, 3681), (98, 3717), (103, 3732), (110, 3795),

Gene: MortyNRick\_4 Start: 3576, Stop: 4232, Start Num: 8

Candidate Starts for MortyNRick\_4:

(7, 3573), (Start: 8 @3576 has 27 MA's), (Start: 32 @3696 has 1 MA's), (33, 3699), (40, 3741), (47, 3792), (53, 3822), (76, 3918), (77, 3921), (83, 3975), (84, 3984), (87, 4020), (89, 4041), (96, 4125), (97, 4128), (98, 4134),

Gene: MrSmee\_4 Start: 3158, Stop: 3907, Start Num: 6

Candidate Starts for MrSmee\_4:

(Start: 6 @3158 has 8 MA's), (11, 3176), (12, 3185), (17, 3209), (18, 3215), (21, 3230), (24, 3239), (25, 3251), (26, 3257), (28, 3272), (33, 3299), (36, 3311), (49, 3413), (73, 3512), (76, 3524), (80, 3548), (88, 3635), (101, 3788),

Gene: ODay\_5 Start: 3606, Stop: 4265, Start Num: 8

Candidate Starts for ODay\_5:

(1, 3531), (Start: 8 @3606 has 27 MA's), (33, 3729), (36, 3741), (40, 3771), (45, 3807), (74, 3942), (77, 3954), (84, 4017), (87, 4053), (88, 4056), (101, 4182),

Gene: Ogotopogo\_6 Start: 3847, Stop: 4491, Start Num: 10

Candidate Starts for Ogotopogo\_6:

(Start: 6 @3832 has 8 MA's), (Start: 10 @3847 has 7 MA's), (Start: 16 @3880 has 1 MA's), (25, 3922), (29, 3937), (31, 3949), (Start: 32 @3958 has 1 MA's), (35, 3970), (36, 3973), (38, 3997), (46, 4045), (62, 4126), (65, 4147), (71, 4168), (84, 4258), (87, 4297), (89, 4318), (97, 4399), (98, 4405), (107, 4459),

Gene: Periwinkle\_5 Start: 3599, Stop: 4243, Start Num: 8

Candidate Starts for Periwinkle\_5:

(Start: 8 @3599 has 27 MA's), (14, 3629), (15, 3632), (25, 3686), (Start: 32 @3722 has 1 MA's), (33, 3725), (40, 3767), (46, 3809), (52, 3842), (76, 3944), (77, 3947), (78, 3950), (89, 4070), (97, 4154), (98, 4160),

Gene: Phabuloso\_5 Start: 3597, Stop: 4241, Start Num: 8

Candidate Starts for Phabuloso\_5:

(Start: 8 @3597 has 27 MA's), (14, 3627), (19, 3651), (21, 3663), (25, 3684), (31, 3711), (Start: 32 @3720 has 1 MA's), (33, 3723), (36, 3735), (46, 3807), (73, 3930), (76, 3942), (77, 3945), (78, 3948), (89, 4068), (97, 4152), (98, 4158),

Gene: Phistory\_5 Start: 3598, Stop: 4242, Start Num: 8

Candidate Starts for Phistory\_5:

(2, 3565), (Start: 8 @3598 has 27 MA's), (14, 3628), (25, 3685), (27, 3691), (Start: 32 @3721 has 1 MA's), (33, 3724), (40, 3766), (46, 3808), (76, 3943), (77, 3946), (89, 4069), (97, 4153), (98, 4159),

Gene: PhorbesPhlower\_4 Start: 3159, Stop: 3800, Start Num: 8

Candidate Starts for PhorbesPhlower\_4:

(Start: 8 @3159 has 27 MA's), (Start: 32 @3282 has 1 MA's), (33, 3285), (36, 3297), (40, 3327), (73, 3495), (74, 3498), (76, 3507), (80, 3531), (82, 3546), (87, 3609), (89, 3630), (92, 3681), (98, 3717), (103, 3732), (110, 3795),

Gene: Pitbull\_4 Start: 3185, Stop: 3862, Start Num: 9

Candidate Starts for Pitbull\_4:

(Start: 9 @3185 has 1 MA's), (20, 3239), (22, 3251), (25, 3269), (30, 3299), (31, 3302), (40, 3356), (48, 3425), (61, 3482), (73, 3530), (75, 3536), (83, 3599), (86, 3641), (87, 3644), (95, 3728), (100, 3767), (102, 3776),

Gene: Raqqa\_5 Start: 3858, Stop: 4661, Start Num: 6

Candidate Starts for Raqqa\_5:

(Start: 6 @3858 has 8 MA's), (17, 3909), (26, 3957), (36, 4011), (49, 4113), (64, 4212), (69, 4251), (73, 4266), (80, 4302), (87, 4386), (88, 4389), (94, 4488), (101, 4542),

Gene: ShawBrad\_5 Start: 3599, Stop: 4243, Start Num: 8

Candidate Starts for ShawBrad\_5:

(Start: 8 @3599 has 27 MA's), (14, 3629), (25, 3686), (Start: 32 @3722 has 1 MA's), (33, 3725), (40, 3767), (46, 3809), (76, 3944), (77, 3947), (78, 3950), (89, 4070), (97, 4154), (98, 4160), (107, 4214),

Gene: SilverChicken\_5 Start: 3735, Stop: 4229, Start Num: 38

Candidate Starts for SilverChicken\_5:

(Start: 6 @3570 has 8 MA's), (Start: 10 @3585 has 7 MA's), (Start: 16 @3618 has 1 MA's), (25, 3660), (29, 3675), (31, 3687), (Start: 32 @3696 has 1 MA's), (36, 3711), (38, 3735), (46, 3783), (62, 3864), (65, 3885), (71, 3906), (84, 3996), (87, 4035), (89, 4056), (97, 4137), (98, 4143), (107, 4197),

Gene: Soul22\_5 Start: 3618, Stop: 4229, Start Num: 16

Candidate Starts for Soul22\_5:

(Start: 6 @3570 has 8 MA's), (Start: 10 @3585 has 7 MA's), (Start: 16 @3618 has 1 MA's), (25, 3660), (29, 3675), (31, 3687), (Start: 32 @3696 has 1 MA's), (35, 3708), (36, 3711), (38, 3735), (46, 3783), (59, 3852), (62, 3864), (65, 3885), (71, 3906), (84, 3996), (87, 4035), (89, 4056), (97, 4137), (98, 4143), (107, 4197),

Gene: Spartoi\_4 Start: 3328, Stop: 4098, Start Num: 4

Candidate Starts for Spartoi\_4:

(3, 3322), (Start: 4 @3328 has 1 MA's), (24, 3427), (45, 3565), (50, 3604), (58, 3643), (61, 3652), (76, 3715), (85, 3790), (87, 3826), (89, 3847), (94, 3916), (111, 4057),

Gene: Spooky\_5 Start: 3598, Stop: 4242, Start Num: 8

Candidate Starts for Spooky\_5:

(Start: 8 @3598 has 27 MA's), (Start: 32 @3721 has 1 MA's), (33, 3724), (35, 3733), (36, 3736), (40, 3766), (49, 3832), (68, 3916), (74, 3934), (77, 3946), (80, 3967), (81, 3970), (87, 4048), (89, 4069), (92, 4123), (94, 4129), (98, 4159),

Gene: Squiddly\_6 Start: 4291, Stop: 4935, Start Num: 8

Candidate Starts for Squiddly\_6:

(Start: 8 @4291 has 27 MA's), (23, 4363), (Start: 32 @4414 has 1 MA's), (33, 4417), (36, 4429), (40, 4459), (49, 4525), (52, 4534), (68, 4609), (73, 4624), (76, 4636), (77, 4639), (80, 4660), (81, 4663), (87, 4741), (89, 4762), (92, 4816), (94, 4822), (98, 4852),

Gene: Whitney\_5 Start: 3722, Stop: 4243, Start Num: 32

Candidate Starts for Whitney\_5:

(Start: 8 @3599 has 27 MA's), (14, 3629), (15, 3632), (25, 3686), (Start: 32 @3722 has 1 MA's), (33, 3725), (40, 3767), (46, 3809), (52, 3842), (76, 3944), (77, 3947), (78, 3950), (89, 4070), (97, 4154), (98, 4160),

Gene: Yoshi\_5 Start: 3585, Stop: 4229, Start Num: 10

Candidate Starts for Yoshi\_5:

(Start: 10 @3585 has 7 MA's), (Start: 16 @3618 has 1 MA's), (25, 3660), (29, 3675), (31, 3687), (Start: 32 @3696 has 1 MA's), (35, 3708), (36, 3711), (38, 3735), (46, 3783), (59, 3852), (62, 3864), (65, 3885), (71, 3906), (84, 3996), (87, 4035), (89, 4056), (97, 4137), (98, 4143), (107, 4197),

Gene: Zapner\_6 Start: 4110, Stop: 4754, Start Num: 10

Candidate Starts for Zapner\_6:

(Start: 10 @4110 has 7 MA's), (Start: 16 @4143 has 1 MA's), (25, 4185), (29, 4200), (31, 4212), (Start: 32 @4221 has 1 MA's), (35, 4233), (36, 4236), (38, 4260), (46, 4308), (59, 4377), (62, 4389), (65, 4410), (71, 4431), (84, 4521), (87, 4560), (89, 4581), (97, 4662), (98, 4668), (107, 4722),

Gene: Zucker\_5 Start: 3788, Stop: 4504, Start Num: 13

Candidate Starts for Zucker\_5:

(Start: 6 @3755 has 8 MA's), (Start: 13 @3788 has 1 MA's), (19, 3815), (21, 3827), (26, 3854), (29, 3872), (33, 3896), (41, 3944), (42, 3962), (44, 3968), (60, 4049), (62, 4058), (67, 4097), (76, 4130), (85, 4196), (94, 4328), (99, 4367), (104, 4388), (106, 4427), (114, 4484),