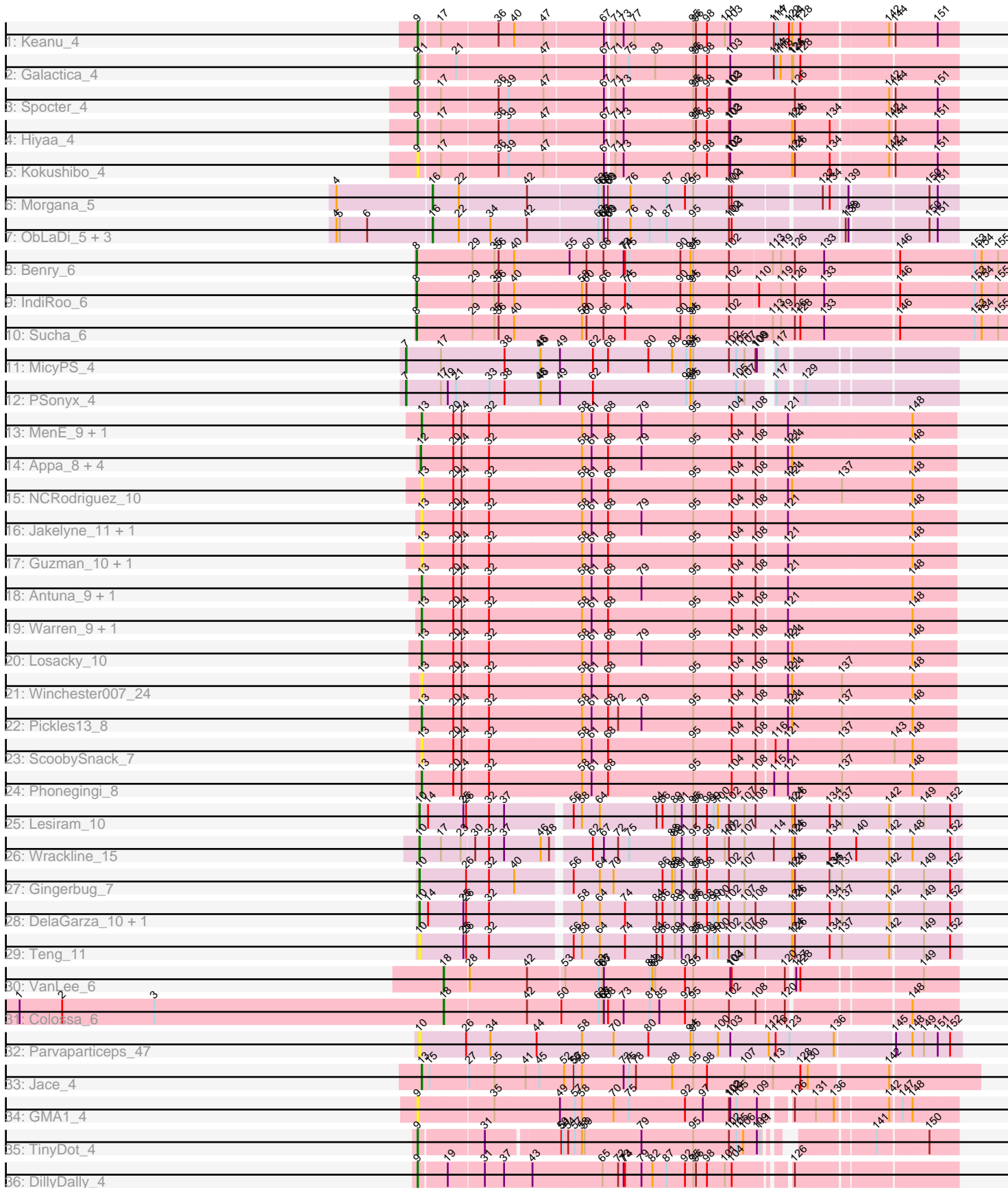


Pham 308773



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 308773 Report

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

Pham number 308773 has 49 members, 14 are drafts.

Phages represented in each track:

- Track 1 : Keanu\_4
- Track 2 : Galactica\_4
- Track 3 : Spocter\_4
- Track 4 : Hiya\_4
- Track 5 : Kokushibo\_4
- Track 6 : Morgana\_5
- Track 7 : ObLaDi\_5, Cafasso\_5, ModicumRichard\_5, Aleemily\_5
- Track 8 : Benry\_6
- Track 9 : IndiRoo\_6
- Track 10 : Sucha\_6
- Track 11 : MicyPS\_4
- Track 12 : PSonyx\_4
- Track 13 : MenE\_9, Violeta\_10
- Track 14 : Appa\_8, Dropshot\_8, PhillyJawn\_9, CookieDog\_9, Bush\_9
- Track 15 : NCRodriguez\_10
- Track 16 : Jakelyne\_11, Phingu\_11
- Track 17 : Guzman\_10, Carrillo\_10
- Track 18 : Antuna\_9, Mariel\_12
- Track 19 : Warren\_9, Blett\_9
- Track 20 : Losacky\_10
- Track 21 : Winchester007\_24
- Track 22 : Pickles13\_8
- Track 23 : ScoobySnack\_7
- Track 24 : Phonegingi\_8
- Track 25 : Lesiram\_10
- Track 26 : Wrackline\_15
- Track 27 : Gingerbug\_7
- Track 28 : DelaGarza\_10, Sweetums\_11
- Track 29 : Teng\_11
- Track 30 : VanLee\_6
- Track 31 : Colossa\_6
- Track 32 : Parvarticeps\_47
- Track 33 : Jace\_4
- Track 34 : GMA1\_4
- Track 35 : TinyDot\_4
- Track 36 : DillyDally\_4

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

The start number called the most often in the published annotations is 13, it was called in 8 of the 35 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Antuna\_9, Blett\_9, Carrillo\_10, Guzman\_10, Jace\_4, Jakelyne\_11, Losacky\_10, Mariel\_12, MenE\_9, NCRodriguez\_10, Phingu\_11, Phonegingi\_8, Pickles13\_8, ScoobySnack\_7, Violeta\_10, Warren\_9, Winchester007\_24,

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

- 

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

- Aleemily\_5, Appa\_8, Benry\_6, Bush\_9, Cafasso\_5, Colossa\_6, CookieDog\_9, DelaGarza\_10, DillyDally\_4, Dropshot\_8, GMA1\_4, Galactica\_4, Gingerbug\_7, Hiyaa\_4, IndiRoo\_6, Keanu\_4, Kokushibo\_4, Lesiram\_10, MicyPS\_4, ModicumRichard\_5, Morgana\_5, ObLaDi\_5, PSonyx\_4, Parvaparticeps\_47, PhillyJawn\_9, Spocter\_4, Sucha\_6, Sweetums\_11, Teng\_11, TinyDot\_4, VanLee\_6, Wrackline\_15,

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

Start 7:

- Found in 2 of 49 ( 4.1% ) of genes in pham
- Manual Annotations of this start: 2 of 35
- Called 100.0% of time when present
- Phage (with cluster) where this start called: MicyPS\_4 (EQ), PSonyx\_4 (EQ),

Start 8:

- Found in 3 of 49 ( 6.1% ) of genes in pham
- Manual Annotations of this start: 3 of 35
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Benry\_6 (EJ), IndiRoo\_6 (EJ), Sucha\_6 (EJ),

Start 9:

- Found in 8 of 49 ( 16.3% ) of genes in pham
- Manual Annotations of this start: 6 of 35
- Called 100.0% of time when present
- Phage (with cluster) where this start called: DillyDally\_4 (singleton), GMA1\_4 (singleton), Galactica\_4 (BQ), Hiyaa\_4 (BQ), Keanu\_4 (BQ), Kokushibo\_4 (BQ), Spocter\_4 (BQ), TinyDot\_4 (singleton),

Start 10:

- Found in 7 of 49 ( 14.3% ) of genes in pham
- Manual Annotations of this start: 5 of 35
- Called 100.0% of time when present
- Phage (with cluster) where this start called: DelaGarza\_10 (GF), Gingerbug\_7 (GF), Lesiram\_10 (GF), Parvaparticeps\_47 (UNK), Sweetums\_11 (GF), Teng\_11 (GF),

Wrackline\_15 (GF),

Start 12:

- Found in 5 of 49 ( 10.2% ) of genes in pham
- Manual Annotations of this start: 4 of 35
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Appa\_8 (GA), Bush\_9 (GA), CookieDog\_9 (GA), Dropshot\_8 (GA), PhillyJawn\_9 (GA),

Start 13:

- Found in 17 of 49 ( 34.7% ) of genes in pham
- Manual Annotations of this start: 8 of 35
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Antuna\_9 (GA), Blett\_9 (GA), Carrillo\_10 (GA), Guzman\_10 (GA), Jace\_4 (singleton), Jakelyne\_11 (GA), Losacky\_10 (GA), Mariel\_12 (GA), MenE\_9 (GA), NCRodriguez\_10 (GA), Phingu\_11 (GA), Phoningi\_8 (GA), Pickles13\_8 (GA), ScoobySnack\_7 (GA), Violeta\_10 (GA), Warren\_9 (GA), Winchester007\_24 (GA),

Start 16:

- Found in 5 of 49 ( 10.2% ) of genes in pham
- Manual Annotations of this start: 5 of 35
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Aleemily\_5 (DZ), Cafasso\_5 (DZ), ModicumRichard\_5 (DZ), Morgana\_5 (DZ), ObLaDi\_5 (DZ),

Start 18:

- Found in 2 of 49 ( 4.1% ) of genes in pham
- Manual Annotations of this start: 2 of 35
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Colossa\_6 (KA), VanLee\_6 (KA),

### **Summary by clusters:**

There are 9 clusters represented in this pham: singleton, EJ, KA, GF, DZ, BQ, GA, UNK, EQ,

Info for manual annotations of cluster BQ:

- Start number 9 was manually annotated 4 times for cluster BQ.

Info for manual annotations of cluster DZ:

- Start number 16 was manually annotated 5 times for cluster DZ.

Info for manual annotations of cluster EJ:

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

Info for manual annotations of cluster EQ:

- Start number 7 was manually annotated 2 times for cluster EQ.

Info for manual annotations of cluster GA:

- Start number 12 was manually annotated 4 times for cluster GA.
- Start number 13 was manually annotated 7 times for cluster GA.

Info for manual annotations of cluster GF:

- Start number 10 was manually annotated 5 times for cluster GF.

Info for manual annotations of cluster KA:

- Start number 18 was manually annotated 2 times for cluster KA.

### **Gene Information:**

Gene: Aleemily\_5 Start: 3924, Stop: 4982, Start Num: 16

Candidate Starts for Aleemily\_5:

(4, 3726), (5, 3732), (6, 3792), (Start: 16 @3924 has 5 MA's), (22, 3978), (34, 4038), (42, 4113), (63, 4257), (65, 4266), (67, 4269), (68, 4278), (69, 4281), (76, 4326), (81, 4368), (87, 4404), (95, 4461), (102, 4539), (104, 4545), (138, 4764), (139, 4770), (150, 4926), (151, 4941),

Gene: Antuna\_9 Start: 4517, Stop: 5632, Start Num: 13

Candidate Starts for Antuna\_9:

(Start: 13 @4517 has 8 MA's), (20, 4583), (24, 4601), (32, 4652), (58, 4847), (61, 4868), (68, 4901), (79, 4973), (95, 5084), (104, 5168), (108, 5219), (121, 5282), (148, 5543),

Gene: Appa\_8 Start: 4382, Stop: 5497, Start Num: 12

Candidate Starts for Appa\_8:

(Start: 12 @4382 has 4 MA's), (20, 4448), (24, 4466), (32, 4517), (58, 4712), (61, 4733), (68, 4766), (79, 4838), (95, 4949), (104, 5033), (108, 5084), (121, 5147), (124, 5153), (148, 5408),

Gene: Benry\_6 Start: 4437, Stop: 5699, Start Num: 8

Candidate Starts for Benry\_6:

(Start: 8 @4437 has 3 MA's), (29, 4548), (35, 4593), (36, 4602), (40, 4635), (55, 4749), (60, 4785), (66, 4821), (73, 4863), (74, 4866), (75, 4875), (90, 4980), (94, 4998), (95, 5004), (102, 5082), (113, 5172), (119, 5187), (126, 5217), (133, 5280), (146, 5436), (153, 5592), (154, 5607), (155, 5643),

Gene: Blett\_9 Start: 4534, Stop: 5649, Start Num: 13

Candidate Starts for Blett\_9:

(Start: 13 @4534 has 8 MA's), (20, 4600), (24, 4618), (32, 4669), (58, 4864), (61, 4885), (68, 4918), (95, 5101), (104, 5185), (108, 5236), (121, 5299), (148, 5560),

Gene: Bush\_9 Start: 4537, Stop: 5652, Start Num: 12

Candidate Starts for Bush\_9:

(Start: 12 @4537 has 4 MA's), (20, 4603), (24, 4621), (32, 4672), (58, 4867), (61, 4888), (68, 4921), (79, 4993), (95, 5104), (104, 5188), (108, 5239), (121, 5302), (124, 5308), (148, 5563),

Gene: Cafasso\_5 Start: 3924, Stop: 4982, Start Num: 16

Candidate Starts for Cafasso\_5:

(4, 3726), (5, 3732), (6, 3792), (Start: 16 @3924 has 5 MA's), (22, 3978), (34, 4038), (42, 4113), (63, 4257), (65, 4266), (67, 4269), (68, 4278), (69, 4281), (76, 4326), (81, 4368), (87, 4404), (95, 4461), (102, 4539), (104, 4545), (138, 4764), (139, 4770), (150, 4926), (151, 4941),

Gene: Carrillo\_10 Start: 4487, Stop: 5602, Start Num: 13

Candidate Starts for Carrillo\_10:

(Start: 13 @4487 has 8 MA's), (20, 4553), (24, 4571), (32, 4622), (58, 4817), (61, 4838), (68, 4871), (95, 5054), (104, 5138), (108, 5189), (121, 5252), (148, 5513),

Gene: Colossa\_6 Start: 3944, Stop: 4984, Start Num: 18

Candidate Starts for Colossa\_6:

(1, 3020), (2, 3113), (3, 3314), (Start: 18 @3944 has 2 MA's), (42, 4112), (50, 4178), (63, 4256), (65, 4265), (67, 4268), (68, 4277), (73, 4310), (81, 4367), (85, 4388), (92, 4442), (95, 4460), (102, 4538), (108, 4595), (120, 4652), (148, 4892),

Gene: CookieDog\_9 Start: 4537, Stop: 5652, Start Num: 12

Candidate Starts for CookieDog\_9:

(Start: 12 @4537 has 4 MA's), (20, 4603), (24, 4621), (32, 4672), (58, 4867), (61, 4888), (68, 4921), (79, 4993), (95, 5104), (104, 5188), (108, 5239), (121, 5302), (124, 5308), (148, 5563),

Gene: DelaGarza\_10 Start: 5267, Stop: 6370, Start Num: 10

Candidate Starts for DelaGarza\_10:

(Start: 10 @5267 has 5 MA's), (14, 5282), (25, 5357), (26, 5363), (32, 5405), (58, 5579), (64, 5615), (74, 5669), (84, 5735), (86, 5747), (89, 5774), (91, 5789), (95, 5813), (96, 5819), (98, 5843), (99, 5858), (100, 5867), (102, 5891), (107, 5924), (108, 5948), (124, 6020), (126, 6026), (134, 6101), (137, 6128), (142, 6227), (149, 6290), (152, 6347),

Gene: DillyDally\_4 Start: 3335, Stop: 4414, Start Num: 9

Candidate Starts for DillyDally\_4:

(Start: 9 @3335 has 6 MA's), (19, 3392), (31, 3464), (37, 3506), (43, 3563), (65, 3707), (72, 3740), (73, 3752), (74, 3755), (79, 3791), (82, 3815), (87, 3845), (92, 3884), (95, 3902), (96, 3908), (98, 3932), (101, 3971), (104, 3986), (126, 4088),

Gene: Dropshot\_8 Start: 4382, Stop: 5497, Start Num: 12

Candidate Starts for Dropshot\_8:

(Start: 12 @4382 has 4 MA's), (20, 4448), (24, 4466), (32, 4517), (58, 4712), (61, 4733), (68, 4766), (79, 4838), (95, 4949), (104, 5033), (108, 5084), (121, 5147), (124, 5153), (148, 5408),

Gene: GMA1\_4 Start: 3255, Stop: 4343, Start Num: 9

Candidate Starts for GMA1\_4:

(Start: 9 @3255 has 6 MA's), (35, 3411), (49, 3546), (57, 3579), (58, 3594), (70, 3660), (75, 3693), (92, 3813), (97, 3852), (102, 3909), (103, 3912), (105, 3924), (109, 3969), (126, 4020), (131, 4065), (136, 4104), (142, 4209), (147, 4230), (148, 4251),

Gene: Galactica\_4 Start: 3574, Stop: 4671, Start Num: 9

Candidate Starts for Galactica\_4:

(Start: 9 @3574 has 6 MA's), (11, 3580), (21, 3649), (47, 3826), (67, 3946), (71, 3961), (75, 3991), (83, 4048), (95, 4129), (96, 4135), (98, 4159), (103, 4210), (114, 4300), (117, 4306), (118, 4315), (124, 4339), (125, 4342), (128, 4357),

Gene: Gingerbug\_7 Start: 4424, Stop: 5527, Start Num: 10

Candidate Starts for Gingerbug\_7:

(Start: 10 @4424 has 5 MA's), (26, 4520), (32, 4562), (40, 4616), (56, 4718), (64, 4772), (70, 4802), (86, 4904), (88, 4925), (89, 4931), (91, 4946), (95, 4970), (96, 4976), (98, 5000), (102, 5048), (107, 5081), (124, 5177), (126, 5183), (134, 5258), (135, 5261), (137, 5285), (142, 5384), (149, 5447), (152, 5504),

Gene: Guzman\_10 Start: 4795, Stop: 5910, Start Num: 13

Candidate Starts for Guzman\_10:

(Start: 13 @4795 has 8 MA's), (20, 4861), (24, 4879), (32, 4930), (58, 5125), (61, 5146), (68, 5179), (95, 5362), (104, 5446), (108, 5497), (121, 5560), (148, 5821),

Gene: Hiyaa\_4 Start: 3595, Stop: 4692, Start Num: 9

Candidate Starts for Hiyaa\_4:

(Start: 9 @3595 has 6 MA's), (17, 3637), (36, 3754), (39, 3775), (47, 3847), (67, 3967), (71, 3982), (73, 4000), (95, 4150), (96, 4156), (98, 4180), (102, 4228), (103, 4231), (124, 4360), (126, 4366), (134, 4441), (142, 4558), (144, 4564), (151, 4648),

Gene: IndiRoo\_6 Start: 4439, Stop: 5701, Start Num: 8

Candidate Starts for IndiRoo\_6:

(Start: 8 @4439 has 3 MA's), (29, 4550), (35, 4595), (36, 4604), (40, 4637), (58, 4778), (60, 4787), (66, 4823), (74, 4868), (75, 4877), (90, 4982), (94, 5000), (95, 5006), (102, 5084), (110, 5144), (119, 5189), (126, 5219), (133, 5282), (146, 5438), (153, 5594), (154, 5609), (155, 5645),

Gene: Jace\_4 Start: 3614, Stop: 4768, Start Num: 13

Candidate Starts for Jace\_4:

(Start: 13 @3614 has 8 MA's), (15, 3629), (27, 3710), (35, 3761), (41, 3824), (45, 3854), (52, 3908), (56, 3929), (57, 3932), (58, 3947), (73, 4034), (75, 4046), (78, 4061), (88, 4139), (95, 4184), (98, 4214), (107, 4295), (113, 4352), (128, 4409), (130, 4424), (142, 4586),

Gene: Jakelyne\_11 Start: 4531, Stop: 5646, Start Num: 13

Candidate Starts for Jakelyne\_11:

(Start: 13 @4531 has 8 MA's), (20, 4597), (24, 4615), (32, 4666), (58, 4861), (61, 4882), (68, 4915), (79, 4987), (95, 5098), (104, 5182), (108, 5233), (121, 5296), (148, 5557),

Gene: Keanu\_4 Start: 3634, Stop: 4731, Start Num: 9

Candidate Starts for Keanu\_4:

(Start: 9 @3634 has 6 MA's), (17, 3676), (36, 3793), (40, 3826), (47, 3886), (67, 4006), (71, 4021), (73, 4039), (77, 4063), (95, 4189), (96, 4195), (98, 4219), (101, 4258), (103, 4270), (114, 4360), (117, 4366), (122, 4393), (124, 4399), (128, 4417), (142, 4597), (144, 4603), (151, 4687),

Gene: Kokushibo\_4 Start: 3595, Stop: 4692, Start Num: 9

Candidate Starts for Kokushibo\_4:

(Start: 9 @3595 has 6 MA's), (17, 3637), (36, 3754), (39, 3775), (47, 3847), (67, 3967), (71, 3982), (73, 4000), (95, 4150), (98, 4180), (102, 4228), (103, 4231), (124, 4360), (126, 4366), (134, 4441), (142, 4558), (144, 4564), (151, 4648),

Gene: Lesiram\_10 Start: 5243, Stop: 6346, Start Num: 10

Candidate Starts for Lesiram\_10:

(Start: 10 @5243 has 5 MA's), (14, 5258), (25, 5333), (26, 5339), (32, 5381), (37, 5414), (56, 5537), (58, 5555), (64, 5591), (84, 5711), (86, 5723), (89, 5750), (91, 5765), (95, 5789), (96, 5795), (98, 5819), (99, 5834), (100, 5843), (102, 5867), (107, 5900), (108, 5924), (124, 5996), (126, 6002), (134, 6077), (137, 6104), (142, 6203), (149, 6266), (152, 6323),

Gene: Losacky\_10 Start: 4681, Stop: 5796, Start Num: 13

Candidate Starts for Losacky\_10:

(Start: 13 @4681 has 8 MA's), (20, 4747), (24, 4765), (32, 4816), (58, 5011), (61, 5032), (68, 5065), (79, 5137), (95, 5248), (104, 5332), (108, 5383), (121, 5446), (124, 5452), (148, 5707),

Gene: Mariel\_12 Start: 4690, Stop: 5805, Start Num: 13

Candidate Starts for Mariel\_12:

(Start: 13 @4690 has 8 MA's), (20, 4756), (24, 4774), (32, 4825), (58, 5020), (61, 5041), (68, 5074), (79, 5146), (95, 5257), (104, 5341), (108, 5392), (121, 5455), (148, 5716),

Gene: MenE\_9 Start: 4648, Stop: 5763, Start Num: 13

Candidate Starts for MenE\_9:

(Start: 13 @4648 has 8 MA's), (20, 4714), (24, 4732), (32, 4783), (58, 4978), (61, 4999), (68, 5032), (79, 5104), (95, 5215), (104, 5299), (108, 5350), (121, 5413), (148, 5674),

Gene: MicyPS\_4 Start: 3733, Stop: 4851, Start Num: 7

Candidate Starts for MicyPS\_4:

(Start: 7 @3733 has 2 MA's), (17, 3808), (38, 3940), (45, 4015), (46, 4018), (49, 4057), (62, 4129), (68, 4162), (80, 4249), (88, 4300), (93, 4330), (94, 4339), (95, 4345), (102, 4423), (105, 4438), (107, 4456), (108, 4480), (109, 4483), (117, 4501),

Gene: ModicumRichard\_5 Start: 3924, Stop: 4982, Start Num: 16

Candidate Starts for ModicumRichard\_5:

(4, 3726), (5, 3732), (6, 3792), (Start: 16 @3924 has 5 MA's), (22, 3978), (34, 4038), (42, 4113), (63, 4257), (65, 4266), (67, 4269), (68, 4278), (69, 4281), (76, 4326), (81, 4368), (87, 4404), (95, 4461), (102, 4539), (104, 4545), (138, 4764), (139, 4770), (150, 4926), (151, 4941),

Gene: Morgana\_5 Start: 3929, Stop: 4987, Start Num: 16

Candidate Starts for Morgana\_5:

(4, 3731), (Start: 16 @3929 has 5 MA's), (22, 3983), (42, 4118), (63, 4262), (65, 4271), (67, 4274), (68, 4283), (69, 4286), (76, 4331), (87, 4409), (92, 4448), (95, 4466), (102, 4544), (104, 4550), (132, 4727), (134, 4742), (139, 4775), (150, 4931), (151, 4946),

Gene: NCRodriguez\_10 Start: 4651, Stop: 5766, Start Num: 13

Candidate Starts for NCRodriguez\_10:

(Start: 13 @4651 has 8 MA's), (20, 4717), (24, 4735), (32, 4786), (58, 4981), (61, 5002), (68, 5035), (95, 5218), (104, 5302), (108, 5353), (121, 5416), (124, 5422), (137, 5527), (148, 5677),

Gene: ObLaDi\_5 Start: 3924, Stop: 4982, Start Num: 16

Candidate Starts for ObLaDi\_5:

(4, 3726), (5, 3732), (6, 3792), (Start: 16 @3924 has 5 MA's), (22, 3978), (34, 4038), (42, 4113), (63, 4257), (65, 4266), (67, 4269), (68, 4278), (69, 4281), (76, 4326), (81, 4368), (87, 4404), (95, 4461), (102, 4539), (104, 4545), (138, 4764), (139, 4770), (150, 4926), (151, 4941),

Gene: PSonyx\_4 Start: 3883, Stop: 5001, Start Num: 7

Candidate Starts for PSonyx\_4:

(Start: 7 @3883 has 2 MA's), (17, 3958), (19, 3973), (21, 3991), (33, 4057), (38, 4090), (45, 4165), (46, 4168), (49, 4207), (62, 4279), (93, 4480), (94, 4489), (95, 4495), (105, 4588), (107, 4606), (117, 4651), (129, 4702),

Gene: Parvaparticeps\_47 Start: 33796, Stop: 32681, Start Num: 10

Candidate Starts for Parvaparticeps\_47:

(Start: 10 @33796 has 5 MA's), (26, 33700), (34, 33655), (44, 33559), (58, 33466), (70, 33400), (80, 33325), (94, 33238), (95, 33232), (100, 33178), (103, 33151), (112, 33070), (116, 33055), (123, 33025), (136, 32929), (145, 32815), (148, 32779), (149, 32758), (151, 32728), (152, 32701),

Gene: PhillyJawn\_9 Start: 4382, Stop: 5497, Start Num: 12

Candidate Starts for PhillyJawn\_9:

(Start: 12 @4382 has 4 MA's), (20, 4448), (24, 4466), (32, 4517), (58, 4712), (61, 4733), (68, 4766), (79, 4838), (95, 4949), (104, 5033), (108, 5084), (121, 5147), (124, 5153), (148, 5408),

Gene: Phingu\_11 Start: 4540, Stop: 5655, Start Num: 13

Candidate Starts for Phingu\_11:

(Start: 13 @4540 has 8 MA's), (20, 4606), (24, 4624), (32, 4675), (58, 4870), (61, 4891), (68, 4924), (79, 4996), (95, 5107), (104, 5191), (108, 5242), (121, 5305), (148, 5566),

Gene: Phonegingi\_8 Start: 4371, Stop: 5486, Start Num: 13

Candidate Starts for Phonegingi\_8:

(Start: 13 @4371 has 8 MA's), (20, 4437), (24, 4455), (32, 4506), (58, 4701), (61, 4722), (68, 4755), (95, 4938), (104, 5022), (108, 5073), (115, 5106), (121, 5136), (137, 5247), (148, 5397),

Gene: Pickles13\_8 Start: 4519, Stop: 5634, Start Num: 13

Candidate Starts for Pickles13\_8:

(Start: 13 @4519 has 8 MA's), (20, 4585), (24, 4603), (32, 4654), (58, 4849), (61, 4870), (68, 4903), (72, 4924), (79, 4975), (95, 5086), (104, 5170), (108, 5221), (121, 5284), (124, 5290), (137, 5395), (148, 5545),

Gene: ScoobySnack\_7 Start: 4239, Stop: 5354, Start Num: 13

Candidate Starts for ScoobySnack\_7:

(Start: 13 @4239 has 8 MA's), (20, 4305), (24, 4323), (32, 4374), (58, 4569), (61, 4590), (68, 4623), (95, 4806), (104, 4890), (108, 4941), (116, 4977), (121, 5004), (137, 5115), (143, 5226), (148, 5265),

Gene: Spocter\_4 Start: 3595, Stop: 4692, Start Num: 9

Candidate Starts for Spocter\_4:

(Start: 9 @3595 has 6 MA's), (17, 3637), (36, 3754), (39, 3775), (47, 3847), (67, 3967), (71, 3982), (73, 4000), (95, 4150), (96, 4156), (98, 4180), (102, 4228), (103, 4231), (126, 4366), (142, 4558), (144, 4564), (151, 4648),

Gene: Sucha\_6 Start: 4437, Stop: 5699, Start Num: 8

Candidate Starts for Sucha\_6:

(Start: 8 @4437 has 3 MA's), (29, 4548), (35, 4593), (36, 4602), (40, 4635), (58, 4776), (60, 4785), (66, 4821), (74, 4866), (90, 4980), (94, 4998), (95, 5004), (102, 5082), (113, 5172), (119, 5187), (126, 5217), (128, 5229), (133, 5280), (146, 5436), (153, 5592), (154, 5607), (155, 5643),

Gene: Sweetums\_11 Start: 5338, Stop: 6441, Start Num: 10

Candidate Starts for Sweetums\_11:

(Start: 10 @5338 has 5 MA's), (14, 5353), (25, 5428), (26, 5434), (32, 5476), (58, 5650), (64, 5686), (74, 5740), (84, 5806), (86, 5818), (89, 5845), (91, 5860), (95, 5884), (96, 5890), (98, 5914), (99, 5929), (100, 5938), (102, 5962), (107, 5995), (108, 6019), (124, 6091), (126, 6097), (134, 6172), (137, 6199), (142, 6298), (149, 6361), (152, 6418),

Gene: Teng\_11 Start: 5267, Stop: 6370, Start Num: 10

Candidate Starts for Teng\_11:

(Start: 10 @5267 has 5 MA's), (25, 5357), (26, 5363), (32, 5405), (56, 5561), (58, 5579), (64, 5615), (74, 5669), (84, 5735), (86, 5747), (89, 5774), (91, 5789), (95, 5813), (96, 5819), (98, 5843), (99, 5858), (100, 5867), (102, 5891), (107, 5924), (108, 5948), (124, 6020), (126, 6026), (134, 6101), (137, 6128), (142, 6227), (149, 6290), (152, 6347),

Gene: TinyDot\_4 Start: 3461, Stop: 4501, Start Num: 9

Candidate Starts for TinyDot\_4:

(Start: 9 @3461 has 6 MA's), (31, 3593), (50, 3737), (51, 3740), (54, 3752), (57, 3767), (58, 3782), (59, 3788), (79, 3908), (95, 4019), (102, 4097), (105, 4112), (106, 4127), (109, 4157), (111, 4163), (141, 4340), (150, 4442),

Gene: VanLee\_6 Start: 3943, Stop: 4983, Start Num: 18

Candidate Starts for VanLee\_6:

(Start: 18 @3943 has 2 MA's), (28, 3994), (42, 4111), (53, 4186), (63, 4255), (65, 4264), (67, 4267), (81, 4366), (82, 4372), (83, 4378), (92, 4441), (95, 4459), (103, 4540), (104, 4543), (120, 4651), (127, 4663), (128, 4672), (149, 4912),

Gene: Violeta\_10 Start: 4478, Stop: 5593, Start Num: 13

Candidate Starts for Violeta\_10:

(Start: 13 @4478 has 8 MA's), (20, 4544), (24, 4562), (32, 4613), (58, 4808), (61, 4829), (68, 4862), (79, 4934), (95, 5045), (104, 5129), (108, 5180), (121, 5243), (148, 5504),

Gene: Warren\_9 Start: 4561, Stop: 5676, Start Num: 13

Candidate Starts for Warren\_9:

(Start: 13 @4561 has 8 MA's), (20, 4627), (24, 4645), (32, 4696), (58, 4891), (61, 4912), (68, 4945), (95, 5128), (104, 5212), (108, 5263), (121, 5326), (148, 5587),

Gene: Winchester007\_24 Start: 10498, Stop: 11613, Start Num: 13

Candidate Starts for Winchester007\_24:

(Start: 13 @10498 has 8 MA's), (20, 10564), (24, 10582), (32, 10633), (58, 10828), (61, 10849), (68, 10882), (95, 11065), (104, 11149), (108, 11200), (121, 11263), (124, 11269), (137, 11374), (148, 11524),

Gene: Wrackline\_15 Start: 5991, Stop: 7091, Start Num: 10

Candidate Starts for Wrackline\_15:

(Start: 10 @5991 has 5 MA's), (17, 6033), (23, 6075), (30, 6102), (32, 6129), (37, 6162), (46, 6237), (48, 6255), (62, 6327), (67, 6348), (72, 6378), (75, 6402), (88, 6492), (89, 6498), (91, 6513), (95, 6537), (98, 6567), (101, 6606), (102, 6615), (107, 6648), (114, 6708), (124, 6747), (126, 6753), (134, 6828), (140, 6882), (142, 6954), (148, 6996), (152, 7074),