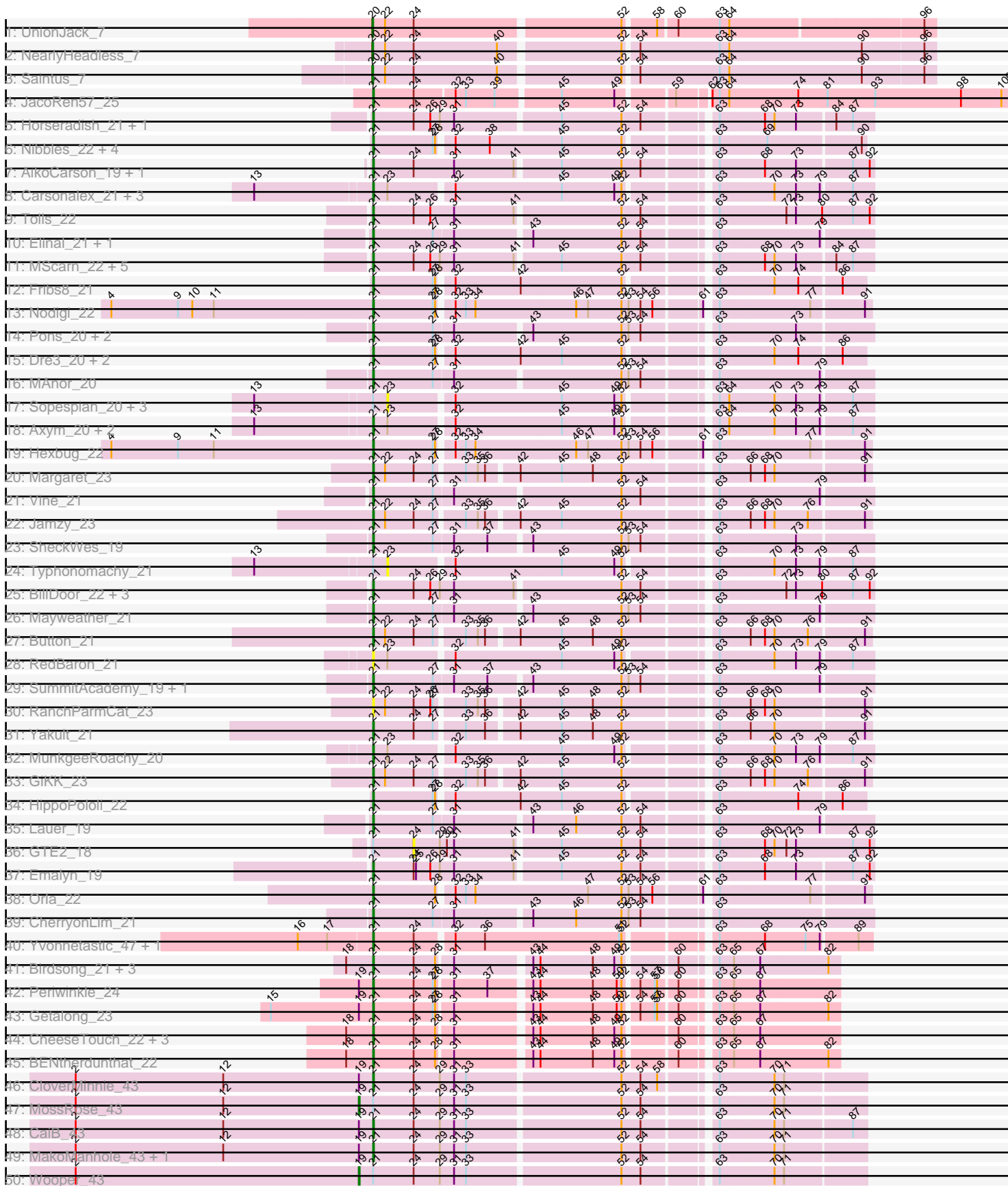
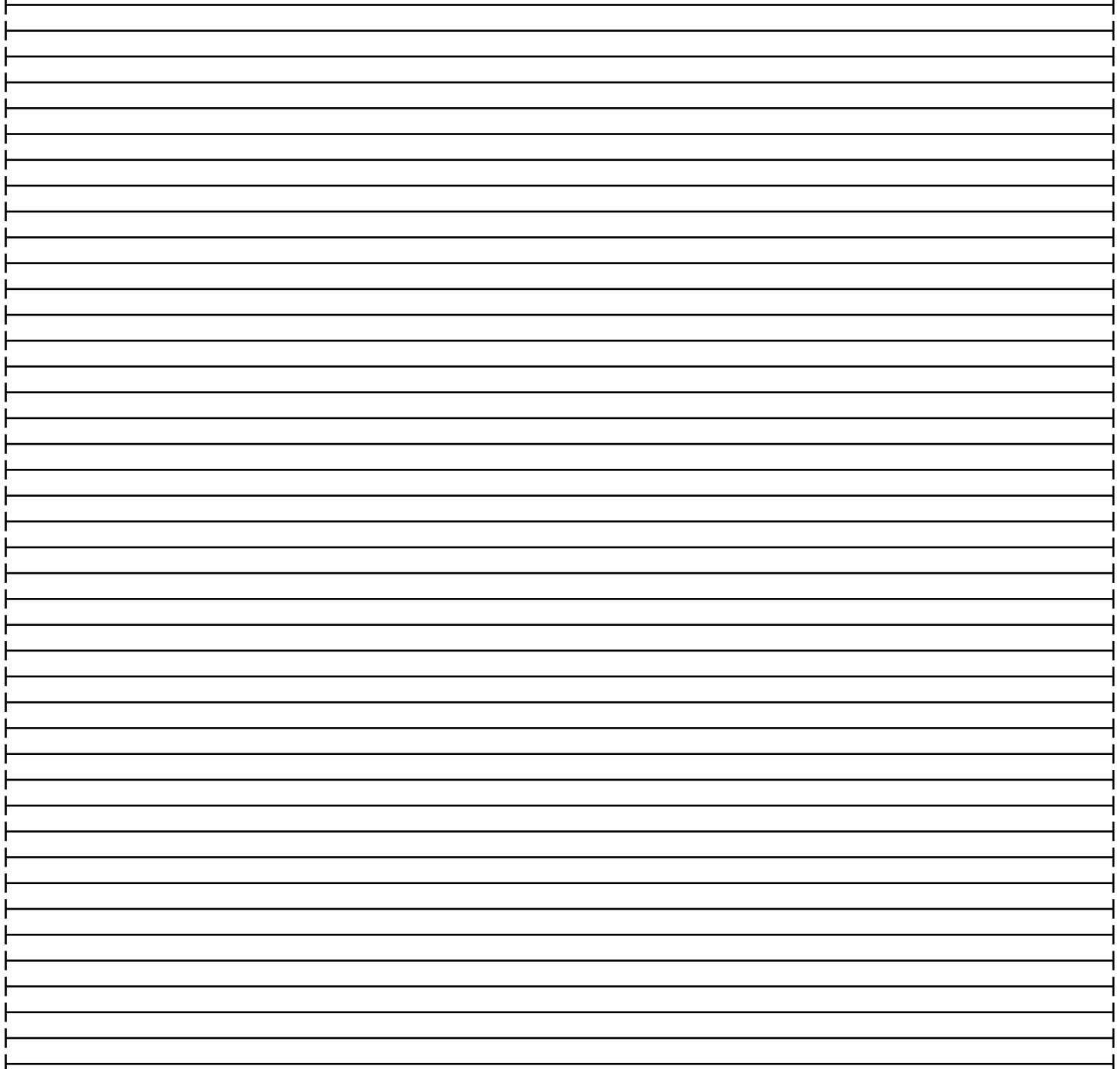
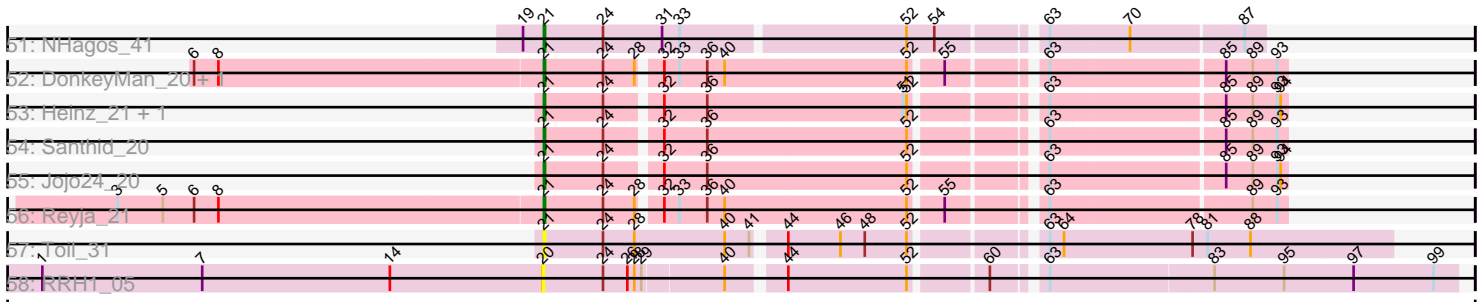


Pham 193902



Pham 193902



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 193902 Report

This analysis was run 11/02/24 on database version 579.

Pham number 193902 has 96 members, 15 are drafts.

Phages represented in each track:

- Track 1 : UnionJack\_7
- Track 2 : NearlyHeadless\_7
- Track 3 : Saintus\_7
- Track 4 : JacoRen57\_25
- Track 5 : Horseradish\_21, Yummy\_21
- Track 6 : Nibbles\_22, Survivors\_22, MaVan\_22, Azira\_22, Zareef\_24
- Track 7 : AikoCarson\_19, Amok\_19
- Track 8 : Carsonalex\_21, Burnsey\_20, Nina\_21, Agatha\_20
- Track 9 : Tolls\_22
- Track 10 : Elinal\_21, KayGee\_20
- Track 11 : MScarn\_22, Biskit\_21, Buttrmlkdreams\_20, Troje\_20, SweatNTears\_22, SketchMex\_19
- Track 12 : Fribs8\_21
- Track 13 : Nodigi\_22
- Track 14 : Pons\_20, Feastonyeet\_19, BigChungus\_19
- Track 15 : Dre3\_20, Gibbous\_20, Cleo\_20
- Track 16 : MAnor\_20
- Track 17 : Sopespian\_20, GoldHunter\_21, PsychoKiller\_20, Elliott\_20
- Track 18 : Axym\_20, Cozz\_20, Quasar\_20
- Track 19 : Hexbug\_22
- Track 20 : Margaret\_23
- Track 21 : Vine\_21
- Track 22 : Jamzy\_23
- Track 23 : SheckWes\_19
- Track 24 : Typhonomachy\_21
- Track 25 : BillDoor\_22, SteamedHams\_22, Yarn\_19, AndPeggy\_19
- Track 26 : Mayweather\_21
- Track 27 : Button\_21
- Track 28 : RedBaron\_21
- Track 29 : SummitAcademy\_19, PotPie\_20
- Track 30 : RanchParmCat\_23
- Track 31 : Yakult\_21
- Track 32 : MunkgeeRoachy\_20
- Track 33 : GiKK\_23
- Track 34 : HippoPololi\_22
- Track 35 : Lauer\_19
- Track 36 : GTE2\_18

- Track 37 : Emalyn\_19
- Track 38 : Orla\_22
- Track 39 : CherryonLim\_21
- Track 40 : Yvonnestic\_47, JonJames\_49
- Track 41 : Birdsong\_21, BearBQ\_21, Kuwabara\_21, MortyNRick\_21
- Track 42 : Periwinkle\_24
- Track 43 : Getalong\_23
- Track 44 : CheeseTouch\_22, Lutum\_22, Kenna\_21, Asapag\_22
- Track 45 : BENtherdunthat\_22
- Track 46 : CloverMinnie\_43
- Track 47 : MossRose\_43
- Track 48 : CaiB\_43
- Track 49 : MakoManhole\_43, AnarQue\_43
- Track 50 : Wooper\_43
- Track 51 : NHagos\_41
- Track 52 : DonkeyMan\_20, Tarzan\_20
- Track 53 : Heinz\_21, Hibiscus\_20
- Track 54 : Santhid\_20
- Track 55 : Jojo24\_20
- Track 56 : Reyja\_21
- Track 57 : Toil\_31
- Track 58 : RRH1\_05

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

The start number called the most often in the published annotations is 21, it was called in 76 of the 81 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Agatha\_20, AikoCarson\_19, Amok\_19, AnarQue\_43, AndPeggy\_19, Asapag\_22, Axym\_20, Azira\_22, BENtherdunthat\_22, BearBQ\_21, BigChungus\_19, BillDoor\_22, Birdsong\_21, Biskit\_21, Burnsey\_20, Button\_21, Buttrmlkdreams\_20, CaiB\_43, Carsonalex\_21, CheeseTouch\_22, CherryonLim\_21, Cleo\_20, CloverMinnie\_43, Cozz\_20, DonkeyMan\_20, Dre3\_20, Elinal\_21, Emalyn\_19, Feastonyeet\_19, Fribs8\_21, Getalong\_23, GiKK\_23, Gibbous\_20, Heinz\_21, Hexbug\_22, Hibiscus\_20, HippoPololi\_22, Horseradish\_21, JacoRen57\_25, Jamzy\_23, Jojo24\_20, JonJames\_49, KayGee\_20, Kenna\_21, Kuwabara\_21, Lauer\_19, Lutum\_22, MAnor\_20, MScarn\_22, MaVan\_22, MakoManhole\_43, Margaret\_23, Mayweather\_21, MortyNRick\_21, MunkgeeRoachy\_20, NHagos\_41, Nibbles\_22, Nina\_21, Nodigi\_22, Orla\_22, Periwinkle\_24, Pons\_20, PotPie\_20, Quasar\_20, RanchParmCat\_23, RedBaron\_21, Reyja\_21, Santhid\_20, SheckWes\_19, SketchMex\_19, SteamedHams\_22, SummitAcademy\_19, Survivors\_22, SweatNTears\_22, Tarzan\_20, Toil\_31, Tolls\_22, Troje\_20, Vine\_21, Yakult\_21, Yarn\_19, Yummy\_21, Yvonnestic\_47, Zareef\_24,

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

- Elliott\_20, GTE2\_18, GoldHunter\_21, MossRose\_43, PsychoKiller\_20, Sopespian\_20, Typhonmarchy\_21, Wooper\_43,

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

- NearlyHeadless\_7, RRH1\_05, Saintus\_7, UnionJack\_7,

### Summary by start number:

#### Start 19:

- Found in 9 of 96 ( 9.4% ) of genes in pham
- Manual Annotations of this start: 2 of 81
- Called 22.2% of time when present
- Phage (with cluster) where this start called: MossRose\_43 (DR), Wooper\_43 (DR),

#### Start 20:

- Found in 4 of 96 ( 4.2% ) of genes in pham
- Manual Annotations of this start: 3 of 81
- Called 100.0% of time when present
- Phage (with cluster) where this start called: NearlyHeadless\_7 (A8), RRH1\_05 (singleton), Saintus\_7 (A8), UnionJack\_7 (A5),

#### Start 21:

- Found in 92 of 96 ( 95.8% ) of genes in pham
- Manual Annotations of this start: 76 of 81
- Called 91.3% of time when present
- Phage (with cluster) where this start called: Agatha\_20 (CT), AikoCarson\_19 (CT), Amok\_19 (CT), AnarQue\_43 (DR), AndPeggy\_19 (CT), Asapag\_22 (DN1), Axym\_20 (CT), Azira\_22 (CT), BENtherdunthat\_22 (DN1), BearBQ\_21 (DN), BigChungus\_19 (CT), BillDoor\_22 (CT), Birdsong\_21 (DN), Biskit\_21 (CT), Burnsey\_20 (CT), Button\_21 (CT), Buttrmlkdreams\_20 (CT), CaiB\_43 (DR), Carsonalex\_21 (CT), CheeseTouch\_22 (DN1), CherryonLim\_21 (CT), Cleo\_20 (CT), CloverMinnie\_43 (DR), Cozz\_20 (CT), DonkeyMan\_20 (DY), Dre3\_20 (CT), Elinal\_21 (CT), Emalyn\_19 (CT), Feastonyeet\_19 (CT), Fribs8\_21 (CT), Getalong\_23 (DN1), GiKK\_23 (CT), Gibbous\_20 (CT), Heinz\_21 (DY), Hexbug\_22 (CT), Hibiscus\_20 (DY), HippoPololi\_22 (CT), Horseradish\_21 (CT), JacoRen57\_25 (AB), Jamzy\_23 (CT), Jojo24\_20 (DY), JonJames\_49 (DD), KayGee\_20 (CT), Kenna\_21 (DN1), Kuwabara\_21 (DN4), Lauer\_19 (CT), Lutum\_22 (DN1), MAnor\_20 (CT), MScarn\_22 (CT), MaVan\_22 (CT), MakoManhole\_43 (DR), Margaret\_23 (CT), Mayweather\_21 (CT), MortyNRick\_21 (DN), MunkgeeRoachy\_20 (CT), NHagos\_41 (DR), Nibbles\_22 (CT), Nina\_21 (CT), Nodigi\_22 (CT), Orla\_22 (CT), Periwinkle\_24 (DN1), Pons\_20 (CT), PotPie\_20 (CT), Quasar\_20 (CT), RanchParmCat\_23 (CT), RedBaron\_21 (CT), Reyja\_21 (DY), Santhid\_20 (DY), SheckWes\_19 (CT), SketchMex\_19 (CT), SteamedHams\_22 (CT), SummitAcademy\_19 (CT), Survivors\_22 (CT), SweatNTears\_22 (CT), Tarzan\_20 (DY), Toil\_31 (singleton), Tolls\_22 (CT), Troje\_20 (CT), Vine\_21 (CT), Yakult\_21 (CT), Yarn\_19 (CT), Yummy\_21 (CT), Yvonnestic\_47 (DD), Zareef\_24 (CT),

#### Start 23:

- Found in 14 of 96 ( 14.6% ) of genes in pham
- No Manual Annotations of this start.
- Called 35.7% of time when present
- Phage (with cluster) where this start called: Elliott\_20 (CT), GoldHunter\_21 (CT), PsychoKiller\_20 (CT), Sopespian\_20 (CT), Typhonmacy\_21 (CT),

#### Start 24:

- Found in 56 of 96 ( 58.3% ) of genes in pham
- No Manual Annotations of this start.

- Called 1.8% of time when present
- Phage (with cluster) where this start called: GTE2\_18 (CT),

### **Summary by clusters:**

There are 11 clusters represented in this pham: DN, singleton, AB, DN1, DD, DN4, A5, DY, A8, DR, CT,

Info for manual annotations of cluster A5:

- Start number 20 was manually annotated 1 time for cluster A5.

Info for manual annotations of cluster A8:

- Start number 20 was manually annotated 2 times for cluster A8.

Info for manual annotations of cluster AB:

- Start number 21 was manually annotated 1 time for cluster AB.

Info for manual annotations of cluster CT:

- Start number 21 was manually annotated 53 times for cluster CT.

Info for manual annotations of cluster DD:

- Start number 21 was manually annotated 2 times for cluster DD.

Info for manual annotations of cluster DN:

- Start number 21 was manually annotated 2 times for cluster DN.

Info for manual annotations of cluster DN1:

- Start number 21 was manually annotated 7 times for cluster DN1.

Info for manual annotations of cluster DN4:

- Start number 21 was manually annotated 1 time for cluster DN4.

Info for manual annotations of cluster DR:

- Start number 19 was manually annotated 2 times for cluster DR.
- Start number 21 was manually annotated 5 times for cluster DR.

Info for manual annotations of cluster DY:

- Start number 21 was manually annotated 5 times for cluster DY.

### **Gene Information:**

Gene: Agatha\_20 Start: 17828, Stop: 18406, Start Num: 21

Candidate Starts for Agatha\_20:

(13, 17687), (Start: 21 @17828 has 76 MA's), (23, 17846), (32, 17921), (45, 18053), (49, 18119), (52, 18128), (63, 18221), (70, 18287), (73, 18314), (79, 18344), (87, 18380),

Gene: AikoCarson\_19 Start: 17137, Stop: 17727, Start Num: 21

Candidate Starts for AikoCarson\_19:

(Start: 21 @17137 has 76 MA's), (24, 17188), (31, 17239), (41, 17314), (45, 17365), (52, 17440), (54, 17464), (63, 17542), (68, 17596), (73, 17635), (87, 17701), (92, 17722),

Gene: Amok\_19 Start: 17134, Stop: 17724, Start Num: 21

Candidate Starts for Amok\_19:

(Start: 21 @17134 has 76 MA's), (24, 17185), (31, 17236), (41, 17311), (45, 17362), (52, 17437), (54, 17461), (63, 17539), (68, 17593), (73, 17632), (87, 17698), (92, 17719),

Gene: AnarQue\_43 Start: 35973, Stop: 36551, Start Num: 21

Candidate Starts for AnarQue\_43:

(2, 35598), (12, 35784), (Start: 19 @35955 has 2 MA's), (Start: 21 @35973 has 76 MA's), (24, 36024), (29, 36057), (31, 36075), (33, 36090), (52, 36276), (54, 36300), (63, 36378), (70, 36444), (71, 36456),

Gene: AndPeggy\_19 Start: 17500, Stop: 18096, Start Num: 21

Candidate Starts for AndPeggy\_19:

(Start: 21 @17500 has 76 MA's), (24, 17551), (26, 17572), (29, 17584), (31, 17602), (41, 17677), (52, 17803), (54, 17827), (63, 17905), (72, 17986), (73, 17998), (80, 18031), (87, 18070), (92, 18091),

Gene: Asapag\_22 Start: 18682, Stop: 19215, Start Num: 21

Candidate Starts for Asapag\_22:

(18, 18649), (Start: 21 @18682 has 76 MA's), (24, 18733), (28, 18760), (31, 18775), (43, 18862), (44, 18871), (48, 18937), (49, 18964), (52, 18973), (60, 19030), (63, 19066), (65, 19084), (67, 19117),

Gene: Axym\_20 Start: 17828, Stop: 18406, Start Num: 21

Candidate Starts for Axym\_20:

(13, 17687), (Start: 21 @17828 has 76 MA's), (23, 17846), (32, 17921), (45, 18053), (49, 18119), (52, 18128), (63, 18221), (64, 18233), (70, 18287), (73, 18314), (79, 18344), (87, 18380),

Gene: Azira\_22 Start: 18806, Stop: 19369, Start Num: 21

Candidate Starts for Azira\_22:

(Start: 21 @18806 has 76 MA's), (27, 18881), (28, 18884), (32, 18899), (38, 18941), (45, 19031), (52, 19106), (63, 19199), (69, 19256), (90, 19364),

Gene: BENtherdunthat\_22 Start: 18682, Stop: 19215, Start Num: 21

Candidate Starts for BENtherdunthat\_22:

(18, 18649), (Start: 21 @18682 has 76 MA's), (24, 18733), (28, 18760), (31, 18775), (43, 18862), (44, 18871), (48, 18937), (49, 18964), (52, 18973), (60, 19030), (63, 19066), (65, 19084), (67, 19117), (82, 19201),

Gene: BearBQ\_21 Start: 19522, Stop: 20055, Start Num: 21

Candidate Starts for BearBQ\_21:

(18, 19489), (Start: 21 @19522 has 76 MA's), (24, 19573), (28, 19600), (31, 19615), (43, 19702), (44, 19711), (48, 19777), (49, 19804), (52, 19813), (60, 19870), (63, 19906), (65, 19924), (67, 19957), (82, 20041),

Gene: BigChungus\_19 Start: 17545, Stop: 18132, Start Num: 21

Candidate Starts for BigChungus\_19:

(Start: 21 @17545 has 76 MA's), (27, 17620), (31, 17644), (43, 17734), (52, 17845), (53, 17854), (54, 17869), (63, 17947), (73, 18040),

Gene: BillDoor\_22 Start: 17468, Stop: 18064, Start Num: 21

Candidate Starts for BillDoor\_22:

(Start: 21 @17468 has 76 MA's), (24, 17519), (26, 17540), (29, 17552), (31, 17570), (41, 17645), (52, 17771), (54, 17795), (63, 17873), (72, 17954), (73, 17966), (80, 17999), (87, 18038), (92, 18059),

Gene: Birdsong\_21 Start: 18415, Stop: 18948, Start Num: 21

Candidate Starts for Birdsong\_21:

(18, 18382), (Start: 21 @18415 has 76 MA's), (24, 18466), (28, 18493), (31, 18508), (43, 18595), (44, 18604), (48, 18670), (49, 18697), (52, 18706), (60, 18763), (63, 18799), (65, 18817), (67, 18850), (82, 18934),

Gene: Biskit\_21 Start: 17483, Stop: 18073, Start Num: 21

Candidate Starts for Biskit\_21:

(Start: 21 @17483 has 76 MA's), (24, 17534), (26, 17555), (29, 17567), (31, 17585), (41, 17660), (45, 17711), (52, 17786), (54, 17810), (63, 17888), (68, 17942), (70, 17954), (73, 17981), (84, 18026), (87, 18047),

Gene: Burnsey\_20 Start: 17829, Stop: 18407, Start Num: 21

Candidate Starts for Burnsey\_20:

(13, 17688), (Start: 21 @17829 has 76 MA's), (23, 17847), (32, 17922), (45, 18054), (49, 18120), (52, 18129), (63, 18222), (70, 18288), (73, 18315), (79, 18345), (87, 18381),

Gene: Button\_21 Start: 16864, Stop: 17439, Start Num: 21

Candidate Starts for Button\_21:

(Start: 21 @16864 has 76 MA's), (22, 16879), (24, 16915), (27, 16939), (33, 16972), (35, 16987), (36, 16996), (42, 17032), (45, 17083), (48, 17122), (52, 17158), (63, 17260), (66, 17296), (68, 17314), (70, 17326), (76, 17368), (91, 17431),

Gene: Buttrmlkdreams\_20 Start: 17465, Stop: 18055, Start Num: 21

Candidate Starts for Buttrmlkdreams\_20:

(Start: 21 @17465 has 76 MA's), (24, 17516), (26, 17537), (29, 17549), (31, 17567), (41, 17642), (45, 17693), (52, 17768), (54, 17792), (63, 17870), (68, 17924), (70, 17936), (73, 17963), (84, 18008), (87, 18029),

Gene: CaiB\_43 Start: 35959, Stop: 36537, Start Num: 21

Candidate Starts for CaiB\_43:

(2, 35584), (12, 35770), (Start: 19 @35941 has 2 MA's), (Start: 21 @35959 has 76 MA's), (24, 36010), (29, 36043), (31, 36061), (33, 36076), (52, 36262), (54, 36286), (63, 36364), (70, 36430), (71, 36442), (87, 36523),

Gene: Carsonalex\_21 Start: 17886, Stop: 18464, Start Num: 21

Candidate Starts for Carsonalex\_21:

(13, 17745), (Start: 21 @17886 has 76 MA's), (23, 17904), (32, 17979), (45, 18111), (49, 18177), (52, 18186), (63, 18279), (70, 18345), (73, 18372), (79, 18402), (87, 18438),

Gene: CheeseTouch\_22 Start: 18676, Stop: 19209, Start Num: 21

Candidate Starts for CheeseTouch\_22:

(18, 18643), (Start: 21 @18676 has 76 MA's), (24, 18727), (28, 18754), (31, 18769), (43, 18856), (44, 18865), (48, 18931), (49, 18958), (52, 18967), (60, 19024), (63, 19060), (65, 19078), (67, 19111),

Gene: CherryonLim\_21 Start: 18254, Stop: 18841, Start Num: 21

Candidate Starts for CherryonLim\_21:

(Start: 21 @18254 has 76 MA's), (27, 18329), (31, 18353), (43, 18443), (46, 18497), (52, 18554), (53, 18563), (54, 18578), (63, 18656),

Gene: Cleo\_20 Start: 18119, Stop: 18682, Start Num: 21

Candidate Starts for Cleo\_20:

(Start: 21 @18119 has 76 MA's), (27, 18194), (28, 18197), (32, 18212), (42, 18293), (45, 18344), (52, 18419), (63, 18512), (70, 18578), (74, 18608), (86, 18656),



Gene: CloverMinnie\_43 Start: 35899, Stop: 36477, Start Num: 21

Candidate Starts for CloverMinnie\_43:

(2, 35524), (12, 35710), (Start: 19 @35881 has 2 MA's), (Start: 21 @35899 has 76 MA's), (24, 35950), (29, 35983), (31, 36001), (33, 36016), (52, 36202), (54, 36226), (58, 36247), (63, 36304), (70, 36370), (71, 36382),

Gene: Cozz\_20 Start: 17829, Stop: 18407, Start Num: 21

Candidate Starts for Cozz\_20:

(13, 17688), (Start: 21 @17829 has 76 MA's), (23, 17847), (32, 17922), (45, 18054), (49, 18120), (52, 18129), (63, 18222), (64, 18234), (70, 18288), (73, 18315), (79, 18345), (87, 18381),

Gene: DonkeyMan\_20 Start: 16981, Stop: 17565, Start Num: 21

Candidate Starts for DonkeyMan\_20:

(6, 16684), (8, 16705), (Start: 21 @16981 has 76 MA's), (24, 17032), (28, 17059), (32, 17074), (33, 17086), (36, 17110), (40, 17125), (52, 17281), (55, 17305), (63, 17374), (85, 17515), (89, 17536), (93, 17557),

Gene: Dre3\_20 Start: 18066, Stop: 18629, Start Num: 21

Candidate Starts for Dre3\_20:

(Start: 21 @18066 has 76 MA's), (27, 18141), (28, 18144), (32, 18159), (42, 18240), (45, 18291), (52, 18366), (63, 18459), (70, 18525), (74, 18555), (86, 18603),

Gene: Elinal\_21 Start: 17498, Stop: 18085, Start Num: 21

Candidate Starts for Elinal\_21:

(Start: 21 @17498 has 76 MA's), (27, 17573), (31, 17597), (43, 17687), (52, 17798), (54, 17822), (63, 17900), (79, 18023),

Gene: Elliott\_20 Start: 17846, Stop: 18406, Start Num: 23

Candidate Starts for Elliott\_20:

(13, 17687), (Start: 21 @17828 has 76 MA's), (23, 17846), (32, 17921), (45, 18053), (49, 18119), (52, 18128), (63, 18221), (64, 18233), (70, 18287), (73, 18314), (79, 18344), (87, 18380),

Gene: Emalyn\_19 Start: 17133, Stop: 17723, Start Num: 21

Candidate Starts for Emalyn\_19:

(Start: 21 @17133 has 76 MA's), (24, 17184), (25, 17187), (26, 17205), (29, 17217), (31, 17235), (41, 17310), (45, 17361), (52, 17436), (54, 17460), (63, 17538), (68, 17592), (73, 17631), (87, 17697), (92, 17718),

Gene: Feastonyeet\_19 Start: 17545, Stop: 18132, Start Num: 21

Candidate Starts for Feastonyeet\_19:

(Start: 21 @17545 has 76 MA's), (27, 17620), (31, 17644), (43, 17734), (52, 17845), (53, 17854), (54, 17869), (63, 17947), (73, 18040),

Gene: Fribs8\_21 Start: 18650, Stop: 19213, Start Num: 21

Candidate Starts for Fribs8\_21:

(Start: 21 @18650 has 76 MA's), (27, 18725), (28, 18728), (32, 18743), (42, 18824), (52, 18950), (63, 19043), (70, 19109), (74, 19139), (86, 19187),

Gene: GTE2\_18 Start: 17225, Stop: 17770, Start Num: 24

Candidate Starts for GTE2\_18:

(Start: 21 @17174 has 76 MA's), (24, 17225), (29, 17258), (30, 17267), (31, 17276), (41, 17351), (45, 17402), (52, 17477), (54, 17501), (63, 17579), (68, 17633), (70, 17645), (72, 17660), (73, 17672), (87,

17744), (92, 17765),

Gene: Getalong\_23 Start: 19482, Stop: 20015, Start Num: 21

Candidate Starts for Getalong\_23:

(15, 19353), (Start: 19 @19464 has 2 MA's), (Start: 21 @19482 has 76 MA's), (24, 19533), (27, 19557), (28, 19560), (31, 19575), (43, 19662), (44, 19671), (48, 19737), (50, 19767), (52, 19773), (54, 19788), (57, 19806), (58, 19809), (60, 19830), (63, 19866), (65, 19884), (67, 19917), (82, 20001),

Gene: GiKK\_23 Start: 17167, Stop: 17742, Start Num: 21

Candidate Starts for GiKK\_23:

(Start: 21 @17167 has 76 MA's), (22, 17182), (24, 17218), (27, 17242), (33, 17275), (35, 17290), (36, 17299), (42, 17335), (45, 17386), (52, 17461), (63, 17563), (66, 17599), (68, 17617), (70, 17629), (76, 17671), (91, 17734),

Gene: Gibbous\_20 Start: 18066, Stop: 18629, Start Num: 21

Candidate Starts for Gibbous\_20:

(Start: 21 @18066 has 76 MA's), (27, 18141), (28, 18144), (32, 18159), (42, 18240), (45, 18291), (52, 18366), (63, 18459), (70, 18525), (74, 18555), (86, 18603),

Gene: GoldHunter\_21 Start: 17847, Stop: 18407, Start Num: 23

Candidate Starts for GoldHunter\_21:

(13, 17688), (Start: 21 @17829 has 76 MA's), (23, 17847), (32, 17922), (45, 18054), (49, 18120), (52, 18129), (63, 18222), (64, 18234), (70, 18288), (73, 18315), (79, 18345), (87, 18381),

Gene: Heinz\_21 Start: 17073, Stop: 17657, Start Num: 21

Candidate Starts for Heinz\_21:

(Start: 21 @17073 has 76 MA's), (24, 17124), (32, 17166), (36, 17202), (51, 17370), (52, 17373), (63, 17466), (85, 17607), (89, 17628), (93, 17649), (94, 17652),

Gene: Hexbug\_22 Start: 17853, Stop: 18434, Start Num: 21

Candidate Starts for Hexbug\_22:

(4, 17529), (9, 17613), (11, 17658), (Start: 21 @17853 has 76 MA's), (27, 17928), (28, 17931), (32, 17946), (33, 17958), (34, 17970), (46, 18096), (47, 18111), (52, 18153), (53, 18162), (54, 18177), (56, 18192), (61, 18246), (63, 18255), (77, 18366), (91, 18426),

Gene: Hibiscus\_20 Start: 17021, Stop: 17605, Start Num: 21

Candidate Starts for Hibiscus\_20:

(Start: 21 @17021 has 76 MA's), (24, 17072), (32, 17114), (36, 17150), (51, 17318), (52, 17321), (63, 17414), (85, 17555), (89, 17576), (93, 17597), (94, 17600),

Gene: HippoPololi\_22 Start: 18718, Stop: 19281, Start Num: 21

Candidate Starts for HippoPololi\_22:

(Start: 21 @18718 has 76 MA's), (27, 18793), (28, 18796), (32, 18811), (42, 18892), (45, 18943), (52, 19018), (63, 19111), (74, 19207), (86, 19255),

Gene: Horseradish\_21 Start: 17379, Stop: 17969, Start Num: 21

Candidate Starts for Horseradish\_21:

(Start: 21 @17379 has 76 MA's), (24, 17430), (26, 17451), (29, 17463), (31, 17481), (45, 17607), (52, 17682), (54, 17706), (63, 17784), (68, 17838), (70, 17850), (73, 17877), (84, 17922), (87, 17943),

Gene: JacoRen57\_25 Start: 24411, Stop: 25172, Start Num: 21

Candidate Starts for JacoRen57\_25:

(Start: 21 @24411 has 76 MA's), (24, 24462), (32, 24510), (33, 24522), (39, 24558), (45, 24633), (49, 24699), (59, 24762), (62, 24798), (63, 24807), (64, 24819), (74, 24906), (81, 24942), (93, 25002), (98, 25110), (100, 25161),

Gene: Jamzy\_23 Start: 17177, Stop: 17752, Start Num: 21

Candidate Starts for Jamzy\_23:

(Start: 21 @17177 has 76 MA's), (22, 17192), (24, 17228), (27, 17252), (33, 17285), (35, 17300), (36, 17309), (42, 17345), (45, 17396), (52, 17471), (63, 17573), (66, 17609), (68, 17627), (70, 17639), (76, 17681), (91, 17744),

Gene: Jojo24\_20 Start: 17018, Stop: 17602, Start Num: 21

Candidate Starts for Jojo24\_20:

(Start: 21 @17018 has 76 MA's), (24, 17069), (32, 17111), (36, 17147), (52, 17318), (63, 17411), (85, 17552), (89, 17573), (93, 17594), (94, 17597),

Gene: JonJames\_49 Start: 35611, Stop: 36183, Start Num: 21

Candidate Starts for JonJames\_49:

(16, 35521), (17, 35557), (Start: 21 @35611 has 76 MA's), (24, 35662), (32, 35704), (36, 35740), (51, 35908), (52, 35911), (63, 36004), (68, 36058), (75, 36109), (79, 36127), (89, 36166),

Gene: KayGee\_20 Start: 17498, Stop: 18085, Start Num: 21

Candidate Starts for KayGee\_20:

(Start: 21 @17498 has 76 MA's), (27, 17573), (31, 17597), (43, 17687), (52, 17798), (54, 17822), (63, 17900), (79, 18023),

Gene: Kenna\_21 Start: 18683, Stop: 19216, Start Num: 21

Candidate Starts for Kenna\_21:

(18, 18650), (Start: 21 @18683 has 76 MA's), (24, 18734), (28, 18761), (31, 18776), (43, 18863), (44, 18872), (48, 18938), (49, 18965), (52, 18974), (60, 19031), (63, 19067), (65, 19085), (67, 19118),

Gene: Kuwabara\_21 Start: 18109, Stop: 18642, Start Num: 21

Candidate Starts for Kuwabara\_21:

(18, 18076), (Start: 21 @18109 has 76 MA's), (24, 18160), (28, 18187), (31, 18202), (43, 18289), (44, 18298), (48, 18364), (49, 18391), (52, 18400), (60, 18457), (63, 18493), (65, 18511), (67, 18544), (82, 18628),

Gene: Lauer\_19 Start: 17547, Stop: 18134, Start Num: 21

Candidate Starts for Lauer\_19:

(Start: 21 @17547 has 76 MA's), (27, 17622), (31, 17646), (43, 17736), (46, 17790), (52, 17847), (54, 17871), (63, 17949), (79, 18072),

Gene: Lutum\_22 Start: 18683, Stop: 19216, Start Num: 21

Candidate Starts for Lutum\_22:

(18, 18650), (Start: 21 @18683 has 76 MA's), (24, 18734), (28, 18761), (31, 18776), (43, 18863), (44, 18872), (48, 18938), (49, 18965), (52, 18974), (60, 19031), (63, 19067), (65, 19085), (67, 19118),

Gene: MAnor\_20 Start: 17509, Stop: 18096, Start Num: 21

Candidate Starts for MAnor\_20:

(Start: 21 @17509 has 76 MA's), (27, 17584), (31, 17608), (52, 17809), (53, 17818), (54, 17833), (63, 17911), (79, 18034),

Gene: MScarn\_22 Start: 17468, Stop: 18058, Start Num: 21

Candidate Starts for MScarn\_22:

(Start: 21 @17468 has 76 MA's), (24, 17519), (26, 17540), (29, 17552), (31, 17570), (41, 17645), (45, 17696), (52, 17771), (54, 17795), (63, 17873), (68, 17927), (70, 17939), (73, 17966), (84, 18011), (87, 18032),

Gene: MaVan\_22 Start: 18806, Stop: 19369, Start Num: 21

Candidate Starts for MaVan\_22:

(Start: 21 @18806 has 76 MA's), (27, 18881), (28, 18884), (32, 18899), (38, 18941), (45, 19031), (52, 19106), (63, 19199), (69, 19256), (90, 19364),

Gene: MakoManhole\_43 Start: 35977, Stop: 36555, Start Num: 21

Candidate Starts for MakoManhole\_43:

(2, 35602), (12, 35788), (Start: 19 @35959 has 2 MA's), (Start: 21 @35977 has 76 MA's), (24, 36028), (29, 36061), (31, 36079), (33, 36094), (52, 36280), (54, 36304), (63, 36382), (70, 36448), (71, 36460),

Gene: Margaret\_23 Start: 17546, Stop: 18121, Start Num: 21

Candidate Starts for Margaret\_23:

(Start: 21 @17546 has 76 MA's), (22, 17561), (24, 17597), (27, 17621), (33, 17654), (35, 17669), (36, 17678), (42, 17714), (45, 17765), (48, 17804), (52, 17840), (63, 17942), (66, 17978), (68, 17996), (70, 18008), (91, 18113),

Gene: Mayweather\_21 Start: 18124, Stop: 18711, Start Num: 21

Candidate Starts for Mayweather\_21:

(Start: 21 @18124 has 76 MA's), (27, 18199), (31, 18223), (43, 18313), (52, 18424), (53, 18433), (54, 18448), (63, 18526), (79, 18649),

Gene: MortyNRick\_21 Start: 18415, Stop: 18948, Start Num: 21

Candidate Starts for MortyNRick\_21:

(18, 18382), (Start: 21 @18415 has 76 MA's), (24, 18466), (28, 18493), (31, 18508), (43, 18595), (44, 18604), (48, 18670), (49, 18697), (52, 18706), (60, 18763), (63, 18799), (65, 18817), (67, 18850), (82, 18934),

Gene: MossRose\_43 Start: 35938, Stop: 36534, Start Num: 19

Candidate Starts for MossRose\_43:

(2, 35581), (12, 35767), (Start: 19 @35938 has 2 MA's), (Start: 21 @35956 has 76 MA's), (24, 36007), (29, 36040), (31, 36058), (33, 36073), (52, 36259), (54, 36283), (63, 36361), (70, 36427), (71, 36439),

Gene: MunkgeeRoachy\_20 Start: 17876, Stop: 18454, Start Num: 21

Candidate Starts for MunkgeeRoachy\_20:

(Start: 21 @17876 has 76 MA's), (23, 17894), (32, 17969), (45, 18101), (49, 18167), (52, 18176), (63, 18269), (70, 18335), (73, 18362), (79, 18392), (87, 18428),

Gene: NHagos\_41 Start: 34560, Stop: 35138, Start Num: 21

Candidate Starts for NHagos\_41:

(Start: 19 @34542 has 2 MA's), (Start: 21 @34560 has 76 MA's), (24, 34611), (31, 34662), (33, 34677), (52, 34863), (54, 34887), (63, 34965), (70, 35031), (87, 35124),

Gene: NearlyHeadless\_7 Start: 4201, Stop: 4878, Start Num: 20

Candidate Starts for NearlyHeadless\_7:

(Start: 20 @4201 has 3 MA's), (22, 4216), (24, 4252), (40, 4357), (52, 4501), (54, 4516), (63, 4615), (64, 4627), (90, 4792), (96, 4864),

Gene: Nibbles\_22 Start: 18806, Stop: 19369, Start Num: 21

Candidate Starts for Nibbles\_22:

(Start: 21 @18806 has 76 MA's), (27, 18881), (28, 18884), (32, 18899), (38, 18941), (45, 19031), (52, 19106), (63, 19199), (69, 19256), (90, 19364),

Gene: Nina\_21 Start: 18870, Stop: 19448, Start Num: 21

Candidate Starts for Nina\_21:

(13, 18729), (Start: 21 @18870 has 76 MA's), (23, 18888), (32, 18963), (45, 19095), (49, 19161), (52, 19170), (63, 19263), (70, 19329), (73, 19356), (79, 19386), (87, 19422),

Gene: Nodigi\_22 Start: 17832, Stop: 18413, Start Num: 21

Candidate Starts for Nodigi\_22:

(4, 17508), (9, 17592), (10, 17610), (11, 17637), (Start: 21 @17832 has 76 MA's), (27, 17907), (28, 17910), (32, 17925), (33, 17937), (34, 17949), (46, 18075), (47, 18090), (52, 18132), (53, 18141), (54, 18156), (56, 18171), (61, 18225), (63, 18234), (77, 18345), (91, 18405),

Gene: Orla\_22 Start: 17836, Stop: 18417, Start Num: 21

Candidate Starts for Orla\_22:

(Start: 21 @17836 has 76 MA's), (28, 17914), (32, 17929), (33, 17941), (34, 17953), (47, 18094), (52, 18136), (53, 18145), (54, 18160), (56, 18175), (61, 18229), (63, 18238), (77, 18349), (91, 18409),

Gene: Periwinkle\_24 Start: 19149, Stop: 19682, Start Num: 21

Candidate Starts for Periwinkle\_24:

(Start: 19 @19131 has 2 MA's), (Start: 21 @19149 has 76 MA's), (24, 19200), (27, 19224), (28, 19227), (31, 19242), (37, 19284), (43, 19329), (44, 19338), (48, 19404), (50, 19434), (52, 19440), (54, 19455), (57, 19473), (58, 19476), (60, 19497), (63, 19533), (65, 19551), (67, 19584),

Gene: Pons\_20 Start: 17499, Stop: 18086, Start Num: 21

Candidate Starts for Pons\_20:

(Start: 21 @17499 has 76 MA's), (27, 17574), (31, 17598), (43, 17688), (52, 17799), (53, 17808), (54, 17823), (63, 17901), (73, 17994),

Gene: PotPie\_20 Start: 18364, Stop: 18951, Start Num: 21

Candidate Starts for PotPie\_20:

(Start: 21 @18364 has 76 MA's), (27, 18439), (31, 18463), (37, 18505), (43, 18553), (52, 18664), (53, 18673), (54, 18688), (63, 18766), (79, 18889),

Gene: PsychoKiller\_20 Start: 17846, Stop: 18406, Start Num: 23

Candidate Starts for PsychoKiller\_20:

(13, 17687), (Start: 21 @17828 has 76 MA's), (23, 17846), (32, 17921), (45, 18053), (49, 18119), (52, 18128), (63, 18221), (64, 18233), (70, 18287), (73, 18314), (79, 18344), (87, 18380),

Gene: Quasar\_20 Start: 18437, Stop: 19015, Start Num: 21

Candidate Starts for Quasar\_20:

(13, 18296), (Start: 21 @18437 has 76 MA's), (23, 18455), (32, 18530), (45, 18662), (49, 18728), (52, 18737), (63, 18830), (64, 18842), (70, 18896), (73, 18923), (79, 18953), (87, 18989),

Gene: RRH1\_05 Start: 3586, Stop: 4320, Start Num: 20

Candidate Starts for RRH1\_05:

(1, 3157), (7, 3295), (14, 3457), (Start: 20 @3586 has 3 MA's), (24, 3637), (26, 3658), (28, 3664), (29, 3670), (40, 3736), (44, 3778), (52, 3880), (60, 3937), (63, 3973), (83, 4111), (95, 4171), (97, 4231), (99, 4300),

Gene: RanchParmCat\_23 Start: 17546, Stop: 18121, Start Num: 21

Candidate Starts for RanchParmCat\_23:

(Start: 21 @17546 has 76 MA's), (22, 17561), (24, 17597), (26, 17618), (27, 17621), (33, 17654), (35, 17669), (36, 17678), (42, 17714), (45, 17765), (48, 17804), (52, 17840), (63, 17942), (66, 17978), (68, 17996), (70, 18008), (91, 18113),

Gene: RedBaron\_21 Start: 17872, Stop: 18450, Start Num: 21

Candidate Starts for RedBaron\_21:

(Start: 21 @17872 has 76 MA's), (23, 17890), (32, 17965), (45, 18097), (49, 18163), (52, 18172), (63, 18265), (70, 18331), (73, 18358), (79, 18388), (87, 18424),

Gene: Reyja\_21 Start: 17192, Stop: 17776, Start Num: 21

Candidate Starts for Reyja\_21:

(3, 16829), (5, 16868), (6, 16895), (8, 16916), (Start: 21 @17192 has 76 MA's), (24, 17243), (28, 17270), (32, 17285), (33, 17297), (36, 17321), (40, 17336), (52, 17492), (55, 17516), (63, 17585), (89, 17747), (93, 17768),

Gene: Saintus\_7 Start: 4176, Stop: 4853, Start Num: 20

Candidate Starts for Saintus\_7:

(Start: 20 @4176 has 3 MA's), (22, 4191), (24, 4227), (40, 4332), (52, 4476), (54, 4491), (63, 4590), (64, 4602), (90, 4767), (96, 4839),

Gene: Santhid\_20 Start: 17026, Stop: 17610, Start Num: 21

Candidate Starts for Santhid\_20:

(Start: 21 @17026 has 76 MA's), (24, 17077), (32, 17119), (36, 17155), (52, 17326), (63, 17419), (85, 17560), (89, 17581), (93, 17602),

Gene: SheckWes\_19 Start: 17499, Stop: 18086, Start Num: 21

Candidate Starts for SheckWes\_19:

(Start: 21 @17499 has 76 MA's), (27, 17574), (31, 17598), (37, 17640), (43, 17688), (52, 17799), (53, 17808), (54, 17823), (63, 17901), (73, 17994),

Gene: SketchMex\_19 Start: 17483, Stop: 18073, Start Num: 21

Candidate Starts for SketchMex\_19:

(Start: 21 @17483 has 76 MA's), (24, 17534), (26, 17555), (29, 17567), (31, 17585), (41, 17660), (45, 17711), (52, 17786), (54, 17810), (63, 17888), (68, 17942), (70, 17954), (73, 17981), (84, 18026), (87, 18047),

Gene: Sopespian\_20 Start: 17847, Stop: 18407, Start Num: 23

Candidate Starts for Sopespian\_20:

(13, 17688), (Start: 21 @17829 has 76 MA's), (23, 17847), (32, 17922), (45, 18054), (49, 18120), (52, 18129), (63, 18222), (64, 18234), (70, 18288), (73, 18315), (79, 18345), (87, 18381),

Gene: SteamedHams\_22 Start: 17501, Stop: 18097, Start Num: 21

Candidate Starts for SteamedHams\_22:

(Start: 21 @17501 has 76 MA's), (24, 17552), (26, 17573), (29, 17585), (31, 17603), (41, 17678), (52, 17804), (54, 17828), (63, 17906), (72, 17987), (73, 17999), (80, 18032), (87, 18071), (92, 18092),

Gene: SummitAcademy\_19 Start: 17579, Stop: 18166, Start Num: 21

Candidate Starts for SummitAcademy\_19:

(Start: 21 @17579 has 76 MA's), (27, 17654), (31, 17678), (37, 17720), (43, 17768), (52, 17879), (53, 17888), (54, 17903), (63, 17981), (79, 18104),

Gene: Survivors\_22 Start: 18655, Stop: 19218, Start Num: 21

Candidate Starts for Survivors\_22:

(Start: 21 @18655 has 76 MA's), (27, 18730), (28, 18733), (32, 18748), (38, 18790), (45, 18880), (52, 18955), (63, 19048), (69, 19105), (90, 19213),

Gene: SweatNTears\_22 Start: 17994, Stop: 18584, Start Num: 21

Candidate Starts for SweatNTears\_22:

(Start: 21 @17994 has 76 MA's), (24, 18045), (26, 18066), (29, 18078), (31, 18096), (41, 18171), (45, 18222), (52, 18297), (54, 18321), (63, 18399), (68, 18453), (70, 18465), (73, 18492), (84, 18537), (87, 18558),

Gene: Tarzan\_20 Start: 16995, Stop: 17579, Start Num: 21

Candidate Starts for Tarzan\_20:

(6, 16698), (8, 16719), (Start: 21 @16995 has 76 MA's), (24, 17046), (28, 17073), (32, 17088), (33, 17100), (36, 17124), (40, 17139), (52, 17295), (55, 17319), (63, 17388), (85, 17529), (89, 17550), (93, 17571),

Gene: Toil\_31 Start: 15291, Stop: 15974, Start Num: 21

Candidate Starts for Toil\_31:

(Start: 21 @15291 has 76 MA's), (24, 15342), (28, 15369), (40, 15447), (41, 15468), (44, 15489), (46, 15534), (48, 15555), (52, 15591), (63, 15684), (64, 15696), (78, 15807), (81, 15819), (88, 15855),

Gene: Tolls\_22 Start: 17504, Stop: 18100, Start Num: 21

Candidate Starts for Tolls\_22:

(Start: 21 @17504 has 76 MA's), (24, 17555), (26, 17576), (31, 17606), (41, 17681), (52, 17807), (54, 17831), (63, 17909), (72, 17990), (73, 18002), (80, 18035), (87, 18074), (92, 18095),

Gene: Troje\_20 Start: 17465, Stop: 18055, Start Num: 21

Candidate Starts for Troje\_20:

(Start: 21 @17465 has 76 MA's), (24, 17516), (26, 17537), (29, 17549), (31, 17567), (41, 17642), (45, 17693), (52, 17768), (54, 17792), (63, 17870), (68, 17924), (70, 17936), (73, 17963), (84, 18008), (87, 18029),

Gene: Typhonomachy\_21 Start: 17846, Stop: 18406, Start Num: 23

Candidate Starts for Typhonomachy\_21:

(13, 17687), (Start: 21 @17828 has 76 MA's), (23, 17846), (32, 17921), (45, 18053), (49, 18119), (52, 18128), (63, 18221), (70, 18287), (73, 18314), (79, 18344), (87, 18380),

Gene: UnionJack\_7 Start: 4229, Stop: 4894, Start Num: 20

Candidate Starts for UnionJack\_7:

(Start: 20 @4229 has 3 MA's), (22, 4244), (24, 4280), (52, 4529), (58, 4565), (60, 4586), (63, 4637), (64, 4649), (96, 4880),

Gene: Vine\_21 Start: 18511, Stop: 19098, Start Num: 21

Candidate Starts for Vine\_21:

(Start: 21 @18511 has 76 MA's), (27, 18586), (31, 18610), (52, 18811), (54, 18835), (63, 18913), (79, 19036),

Gene: Wooper\_43 Start: 35976, Stop: 36572, Start Num: 19

Candidate Starts for Wooper\_43:

(2, 35619), (Start: 19 @35976 has 2 MA's), (Start: 21 @35994 has 76 MA's), (24, 36045), (29, 36078), (31, 36096), (33, 36111), (52, 36297), (54, 36321), (63, 36399), (70, 36465), (71, 36477),

Gene: Yakult\_21 Start: 17400, Stop: 17975, Start Num: 21

Candidate Starts for Yakult\_21:

(Start: 21 @17400 has 76 MA's), (24, 17451), (27, 17475), (33, 17508), (36, 17532), (42, 17568), (45, 17619), (48, 17658), (52, 17694), (63, 17796), (66, 17832), (70, 17862), (91, 17967),

Gene: Yarn\_19 Start: 17494, Stop: 18090, Start Num: 21

Candidate Starts for Yarn\_19:

(Start: 21 @17494 has 76 MA's), (24, 17545), (26, 17566), (29, 17578), (31, 17596), (41, 17671), (52, 17797), (54, 17821), (63, 17899), (72, 17980), (73, 17992), (80, 18025), (87, 18064), (92, 18085),

Gene: Yummy\_21 Start: 17379, Stop: 17969, Start Num: 21

Candidate Starts for Yummy\_21:

(Start: 21 @17379 has 76 MA's), (24, 17430), (26, 17451), (29, 17463), (31, 17481), (45, 17607), (52, 17682), (54, 17706), (63, 17784), (68, 17838), (70, 17850), (73, 17877), (84, 17922), (87, 17943),

Gene: Yvonnetastic\_47 Start: 33146, Stop: 33718, Start Num: 21

Candidate Starts for Yvonnetastic\_47:

(16, 33056), (17, 33092), (Start: 21 @33146 has 76 MA's), (24, 33197), (32, 33239), (36, 33275), (51, 33443), (52, 33446), (63, 33539), (68, 33593), (75, 33644), (79, 33662), (89, 33701),

Gene: Zareef\_24 Start: 18807, Stop: 19370, Start Num: 21

Candidate Starts for Zareef\_24:

(Start: 21 @18807 has 76 MA's), (27, 18882), (28, 18885), (32, 18900), (38, 18942), (45, 19032), (52, 19107), (63, 19200), (69, 19257), (90, 19365),