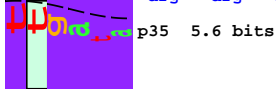piece 1, NC_000913, matA_ykgL+, config: linear, direction: +, begin: 310531, end: 311355
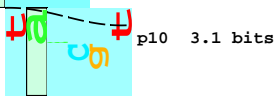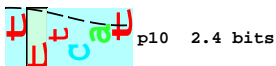
```
        *      *310540    *        *310550    *        *310560    *        *310570    *        *310580    *        *310590    *        *310600    *        *310610
5' g t c c c t a c t g t a a t c a c t t t g c c a t g t c a c t a c t t t c c a a a c c t g t a a t t t t t a c a g g t g c a t t c a g t t t c c t t a g t a a a c 3'
   - val - pro - thr - val - ile - thr - leu - pro - cys - his - tyr - phe - pro - asn - leu -    ●   -   -   -   - -fMet - his - ser - val - ser - leu - val ● asn -   -
     - ser - leu - leu -       ●                                                                                                              ●          ●
   - pro - tyr - cys - asn - his - phe - ala - met - ser - leu - leu - ser - lys - pro - val - ile - phe - thr - gly - ala - phe - ser - phe - leu - ser - lys - pro -
```

p35 3.6 bits   p10 3.8 bits   p10 4.4 bits   ... p10

{------------------------------} p35-(22)-p10 310562 Gap 2.3 bits   p35 5.5 bits   p35 5.3 bits

|------------------------------| p35-p10 310562 total 5.0 bits   {--} p35-(26)-p10 310608 Gap 3.7 bits

p35 2.4 bits |--| p35-p10 310608 total 4.0 bits

{------------------------------} p35-(22)-p10 310577 Gap 2.3 bits   {----------------------- ... p35-(24)-p10 310623 Gap
|------------------------------| p35-p10 310577 total 4.5 bits |----------------------- ... p35-p10 310623 total 8.5

```
        *      *310620    *        *310630    *        *310640    *        *310650    *        *310660    *        *310670    *        *310680    *        *310690
5' c g g a a g t a a t a a g a t a c g t a g t a c a t a t c a a t a a a g g t t a a a c g a g a t t a a g t t t a a t t a t t t t c g a t t g g g c t t a a t t 3'
   - arg - lys -    ●   -   -   -   -   ●   -   -   -   -   ●   -   -   -   -   -   -   ●   -   -   -   -   ●   -   -   -   ●   -   -   -   -   -   ●   -   -   -
     - glu - val - asn - lys - ile - arg - ser - thr - tyr - gln -   ●   -   -   -   -   -   -   -   - -fMet - gly - leu - asn - leu -
```

... p10 2.2 bits   p10 5.7 bits   p35 5.7 bits   p10 3.7 bits

{--} p35-(21)-p10 310687 Gap 3.3 bits
|--| p35-p10 310687 total 6.1 bits

p35 1.0 bits   p10 5.7 bits

... {----------------------- p35-(24)-p10 310623 Gap 2.4 bits   {--} p35-(22)-p10 310688 Gap 2.3 bits
... |----------------------- p35-p10 310623 total 8.5 bits |--| p35-p10 310688 total 9.1 bits

... p10

{--} p35-(23)-p10 310689 Gap 1.4 bits
|--| p35-p10 310689 total 4.9 bits
{----------------------- ... p35-(23)-p10 310694 Gap
|----------------------- ... p35-p10 310694 total 4.2

```
        *      *310700    *        *310710    *        *310720    *        *310730    *        *310740    *        *310750    *        *310760    *        *310770
5' t a t g t t t t t t t t c c c g a t g a g t g t c a a t a t g t g a a c g g a a a a g g a a t t c a a t g g t t a a g t c a a t a t t t a g a a a a a c t g a a a 3'
   -   -   -   -   -   -   -   -   -   - -fMet - asn - gly - lys - gly - ile - gln - trp - leu - ser - gln - tyr - leu - glu - lys - leu - lys -
   - -fMet - phe - phe - phe - pro - met - ser - val - asn - met -   ●
   - cys - phe - phe - ser - arg -   ●   - -fMet - ser - ile - cys - glu - arg - lys - arg - asn - ser - met - val - lys - ser - ile - phe - arg - lys - thr - glu - asn -
```

sd   ir matA_ykgL+

p10 4.6 bits   [###> orf 2 codons   ir matA_ykgL+

{------------------} sd-(10)-ir 310721 Gap 2.7 bits
|------------------| sd-ir 310721 matA_ykgL+ total 7.3 bits   sd

{------------} sd-(7)-ir 310743 Gap 3.7 bits

... p10 0.6 bits |------------| sd-ir 310743 matA_ykgL+ total 11.3 bits

```
...  --}  p35-(23)-p10 310694 Gap 1.4 bits
...  --|  p35-p10 310694 total 4.2 bits
```
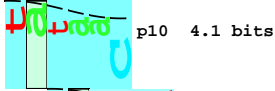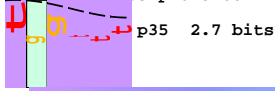
```
       *      *310780    *      *310790    *      *310800    *      *310810    *      *310820    *      *310830    *      *310840    *      *310850
5' atattgctttttgataagaaagaaaagacatttggtttcataaggttattggcaatataacgttcaattcttacttgcat 3'
 - ile - leu - leu - phe -   -    -    -    -    -    -    -    -    -    -    -    -    -    -    -    -    -    -    -fMet - ala - ile -   -    -    -    -    -    -    -    -    -fMet - his -
             - ile - ala - phe - leu - ile - arg - arg - lys - arg - his - leu - val - ser -
```

p35 5.6 bits

[###> orf 25 codons

p10 4.1 bits

p10 2.4 bits

p10 3.1 bits

p35-(25)-p10 310811 Gap 4.0 bits
p35-p10 310811 total 4.0 bits

p35 2.7 bits

p35-(23)-p10 310831 Gap 1.4 bits
p35-p10 310831 total 5.3 bits

p35 5.3 bits

p35-(22)-p10 310833 Gap 2.3 bits
p35-p10 310833 total 6.0 bits

```
       *      *310860    *      *310870    *      *310880    *      *310890    *      *310900    *      *310910    *      *310920    *      *310930    *
5' tttatattgtcaggaactttgccctgaagtgttaatgtcttaatgcgctgtgatggactagtaaaaaacaagt 3'
 - phe - ile - leu - val - arg - asn - phe - ala - leu - lys - cys -    -    -    -    -    -    -    -    -fMet -
                                   -fMet - pro -
                       -fMet - leu - gly - ile - val - leu - met - arg - cys - val - met - asp -
```

... p35
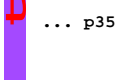
```
       *      *310940    *      *310950    *      *310960    *      *310970    *      *310980    *      *310990    *      *311000    *      *311010    *
5' tttaagggtaaggatagaatatataaactatgatgagctgtcattgaagatgatttgccaatcagtaagatattttaatgg 3'
                                                             -fMet - pro - ile - ser - lys - ile - phe -
                               -fMet - met - ser - cys - his -
         -fMet - lys - met - ile - cys - gln - ser - val - arg - tyr - phe - asn - gly -   -fMet - asp -
```
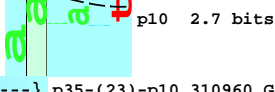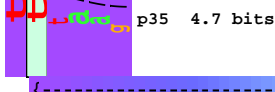
... p35 4.7 bits

p10 3.3 bits

p35 5.5 bits
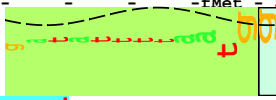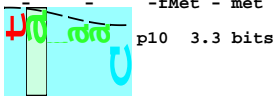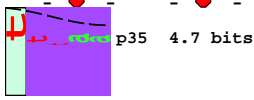
... sd

p35-(23)-p10 310959 Gap 1.4 bits

p35 2.6 bits

p10 5.7 bits   {- ... sd-(7)-ir 311023 Gap
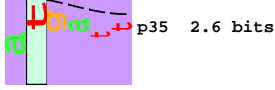
p35-p10 310959 total 6.5 bits

|- ... sd-ir 311023 matA_ykgL+ t...

p35 4.7 bits

p10 2.7 bits
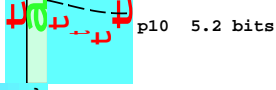
p35-(22)-p10 311002 Gap 2.3 bits
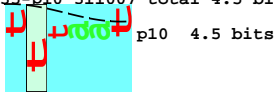
p35-(23)-p10 310960 Gap 1.4 bits

p35-p10 311002 total 8.9 bits

p35-p10 310960 total 5.9 bits

p10 5.2 bits

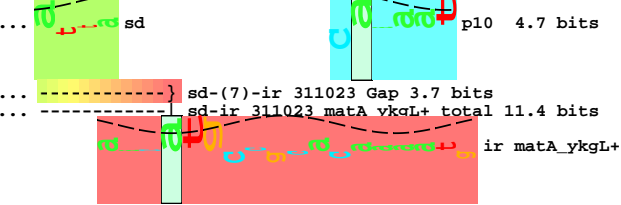p35-(21)-p10 311007 Gap 3.3 bits
p35-p10 311007 total 4.5 bits

p10 4.5 bits

{- ->} p35-(24)-p10 311010 Gap 2.4 bits
|- -| p35-p10 311010 total 4.7 bits
p35 5.7 bits

... p35-(22)-p10 311032 Gap
- - - - - - - - - - ... p35-p10 311032 total 8.1

```
       *311020     *     *311030     *     *311040     *     *311050     *     *311060     *     *311070     *     *311080     *     *311090     *
5' attaacatgccgcacaaaatggttacaggtgttcattccaataagtaatggaaaattgaacgggcgtatgtacgtcatctg 3'
    -fMet - pro - his - lys - met - val - thr - gly - val - his - ser - asn - lys -
 - leu - thr - cys - arg - thr - lys - trp - leu - gln - val - phe - ile - pro - ile - ser - asn - gly - lys - leu - asn - gly - arg - met - tyr - val - ile - cys -
                                                             -fMet - glu - asn -
```
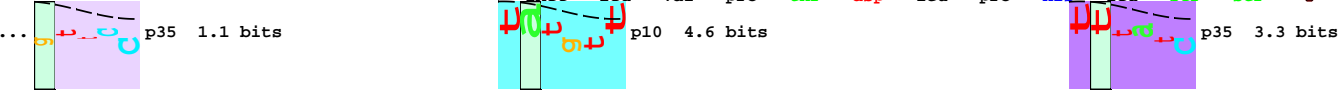
... sd

[###> orf 14 codons

... - - - - - - - -} sd-(7)-ir 311023 Gap 3.7 bits
... - - - - - - - - -| sd-ir 311023 matA ykgL+ total 11.4 bits

ir matA_ykgL+

... ->} p35-(22)-p10 311032 Gap 2.3 bits
... -| p35-p10 311032 total 8.1 bits

```
   *311100     *     *311110     *     *311120     *     *311130     *     *311140     *     *311150     *     *311160     *     *311170     *
5' ttcggtaagccccaagaggccagattaagtgaagttaaacgaaggctgccagctgtcacaggaacgatggcctttttgtca 3'
                                                             -fMet - ala - phe - leu - ser -
 - ser - val - ser - pro - gln - glu - pro - asp -  -fMet - lys - leu - asn - glu - gly - cys - gln - leu - ser - gln - glu - arg - trp - pro - phe - cys - gln -
   *311180     *     *311190     *     *311200     *     *311210     *     *311220     *     *311230     *     *311240     *     *311250     *
5' gggcactgcattcagttatctgtgcgcgttactctaactggcactcgaacgtcggcgacgggttaccggtggatcagact 3'
 - gly - his - cys - ile - gln - leu - ser - val - arg - val - thr - leu - thr - gly - thr - arg - thr - ser - ala - thr - gly - leu - pro - val - asp - gln - thr -
  - gly - thr - ala - phe - ser - tyr - leu - cys - ala - leu - leu -
```

... p35

```
   *311260     *     *311270     *     *311280     *     *311290     *     *311300     *     *311310     *     *311320     *     *311330     *    *311340
5' gttcctgtggcgtaacgttttatgttagtaccaacagatttaccacatttatcatcttaacagtttgagtgaaaatgca 3'
 - val - pro - val - ala -
                                           -fMet - leu - val - pro - thr - asp - leu - pro - his - leu - ser - ser -     -fMet - ser - glu - asn - ala -
                                                                                                                    -fMet - lys - met - gln -
```

... p35 1.1 bits

p10 4.6 bits

p35 3.3 bits

[- - - - - - - - - ... NC_000913.ykgL

p10 3.6 bits

{- - - - - - - - - - - - - - - - - - -} p35-(23)-p10 311283 Gap 1.4 bits

|- - - - - - - - - - - - - - - - - - -| p35-p10 311283 total 4.2 bits

{- - - - - - - - - - - - - - - - - - - ->} p35-(23)-p10 311333 Gap 1.4 bits
|- - - - - - - - - - - - - - - - - - - -| p35-p10 311333 total 5.4 bits

```
        *     *311350     *
5' ggctgcgccgcaaag 3'
 - gly - cys - ala - ala - lys -
   - ala - ala - pro - gln -
```

... - ... NC_000913.ykgL