

NCBI Gene Viewer
によるゲノム上の遺伝子配列の閲覧

NCBI (National Center for Biotechnology Information)のホームページ

<http://www.ncbi.nlm.nih.gov/>

NCBI HomePage

http://www.ncbi.nlm.nih.gov/

NCBI

National Center for Biotechnology Information
National Library of Medicine National Institutes of Health

PubMed All Databases BLAST OMIM Books TaxBrowser Structure

Search All Databases for Go

SITE MAP
Alphabetical List
Resource Guide

About NCBI
An introduction to NCBI

GenBank
Sequence submission support and software

Literature databases
PubMed, OMIM, Books, and PubMed Central

Molecular databases
Sequences, structures, and taxonomy

Try NCBI's new home page! NEW

NCBI's [new home page and site guide](#) provide a catalog of NCBI resources, a consistent menu bar at the top of each page, and step-by-step instructions for common tasks. The page you are now reading will soon be replaced by the new design.

▶ What does NCBI do?

Established in 1988 as a national resource for molecular biology information, NCBI creates public databases, conducts research in computational biology, develops software tools for analyzing genome data, and disseminates biomedical information - all for the better understanding of molecular processes affecting human health and disease. [More about NCBI...](#)

Hot Spots

- ▶ Clusters of orthologous groups
- ▶ Coffee Break, Genes & Disease, NCBI Handbook
- ▶ Electronic PCR
- ▶ Entrez Home
- ▶ Entrez Tools
- ▶ Gene expression omnibus (GEO)
- ▶ Human genome resources
- ▶ Influenza Virus Resource
- ▶ Map Viewer

クエリー（質問、調べたいもの）を入力

この場合はMycoplasma genitaliumという生物種名

Go buttonを押す

The image shows a screenshot of the NCBI homepage in a web browser. The browser's address bar shows the URL <http://www.ncbi.nlm.nih.gov/>. The page title is "NCBI HomePage". The main navigation bar includes links for "PubMed", "All Databases", "BLAST", "OMIM", "Books", "TaxBrowser", and "Structure". A search bar is located below the navigation bar, with the text "Search All Databases for Mycoplasma genitalium" and a "Go" button. Two blue arrows point to the search bar and the "Go" button, with text labels above them: "クエリー（質問、調べたいもの）を入力" and "この場合はMycoplasma genitaliumという生物種名" pointing to the search bar, and "Go buttonを押す" pointing to the "Go" button. The page content includes a "SITE MAP" section on the left, a "Try NCBI's new home page!" announcement, and a "Hot Spots" section on the right.

クエリーに関するさまざまな情報が返される

例えば文献情報としてM. genitaliumに関するもののアブストラクトが643件

Database	Count
PubMed: biomedical literature citations and abstracts	643
PubMed Central: free, full text journal articles	1027
Site Search: NCBI web and FTP sites	12
Nucleotide: Core subset of nucleotide sequence records	1050
EST: Expressed Sequence Tag records	11
GSS: Genome Survey Sequence records	5
Protein: sequence database	3001
Genom: whole genome sequences	14
Structure: three-dimensional macromolecular structures	5
Taxonomy: organisms in GenBank	1
SNP: single nucleotide	none
Books: online books	38
OMIM: online Mendelian Inheritance in Man	1
OMIA: online Mendelian Inheritance in Animals	none
dbGaP: genotype and phenotype	4
UniGene: gene-oriented clusters of transcript sequences	none
CDD: conserved protein domain database	4
3D Domains: domains from Entrez Structure	10
UniSTS: markers and mapping data	none
PopSet: population study data sets	5
GEO Profiles: expression and molecular abundance profiles	none
GEO DataSets: experimental sets of	none

M. genitaliumに関連するタンパク質の情報が3001件

M. genitaliumに関連するゲノムの情報が14件

M. genitaliumに関連するタンパク質の立体構造情報が5件

今回はゲノム情報を知りたいのでここをクリック

Mycoplasma genitalium - Genome Results

http://www.ncbi.nlm.nih.gov/sites/entrez?db=genome&cmd=search&term=Mycoplasma%20genitalium

NCBI

川端講義 【コラム】 OS...ミジャーナル Terminalと...文字コード変換 Double Slas...CL AO Bench PDB MM 比ゲ SF TIGR

NCBI My NCBI [Sign In] [Register]

All Databases PubMed Nucleotide Protein Genome Structure OMIM PMC Journals Books

Search Genome for Mycoplasma genitalium Go Clear Save Search

Limits Preview/Index History Clipboard Details

Display Summary Show 20 Send to

All: 14

Items 1 - 14 of 14 One page.

Recent activity

Turn Off Clear

Mycoplasma genitalium (14) Genome

» See more...

1: [NC_004088](#) Links
 Yersinia pestis KIM, complete genome
dsDNA; circular; Length: 4,600,755 nt
 Replicon Type: **chromosome**
 Created: 2002/07/29

2: [NZ_AAGX000000000](#) Links
 Mycoplasma genitalium G37, whole genome shotgun sequencing project
DNA; Length: 560,035 nt
 Created: 2005/06/02

3: [NT_166527](#) Links
 Aspergillus niger CBS 513.88 clone An12
DNA; linear; Length: 2,566,738 nt
 Replicon Type: **chromosome**
 Replicon Name: **An12**
 Created: 2007/04/13

4: [NC_007280](#) Links
 Trypanosoma brucei TREU927 chromosome 7, complete sequence
DNA; linear; Length: 2,205,233 nt
 Replicon Type: **chromosome**
 Replicon Name: **7**
 Created: 2005/08/12

5: [NC_000908](#) ← Links
 Mycoplasma genitalium G37, complete genome
dsDNA; circular; Length: 580,076 nt
 Replicon Type: **chromosome**
 Created: 2001/01/08

M. Genitaliumの完全ゲノム配列、

GenBank形式のファイルを表示

コードされるタンパク質の一覧

Genome > Bacteria > Mycoplasma genitalium G37, complete genome

Lineage: Bacteria; Tenericutes; Mollicutes; Mycoplasmatales; Mycoplasmataceae; Mycoplasma; Mycoplasma genitalium; Mycoplasma genitalium G37

Genome info:	Features:	BLAST homologs:	Links:	Review Info:
Refseq: NC_000908	Genes: 524	COG	Genome Project	Publications: [4]
GenBank: L4396	Protein coding: 475	TaxMap	Refseq FTP	Refseq Status: PROVISIONAL
Length: 580,076 nt	Structural RNAs: 43	TaxPlot	GenBank FTP	Seq. Status: Completed
GC Content: 31%	Pseudo genes: 6	GenePlot	BLAST	Sequencing center: TIGR
% Coding: 90%	Others: 6	gMap	TraceAssembly	Completed: 2001/01/08
Topology: circular	Contigs: None		CDD	Organism Group
Molecule: dsDNA			Other genomes for species:	

Gene Classification based on [COG functional categories](#) Search gene, GeneID or locus_tag:

ゲノム部分の遺伝子の並びを表示

1 nt 12,724 nt

580076 nt

Click [here](#) for Sequence Viewer presentation (base sequence and aligned amino acids) of selected region

Display Overview Show 20 Send to

Write to the Help Desk
NCBI | NLM | NIH
Department of Health & Human Services
[Privacy Statement](#) | [Freedom of Information Act](#) | [Disclaimer](#)

遺伝子名検索

表示領域の表示

上流(5'側に移動)

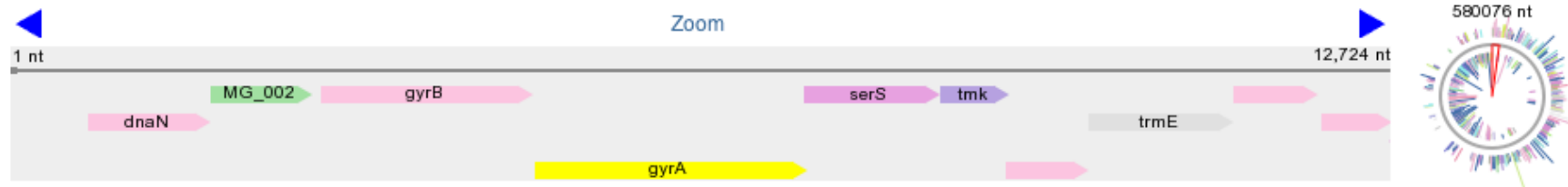
下流(3'側に移動)

ここに、遺伝子名などを入力してFind Geneをクリックするとその遺伝子領域に移動

Gene Classification based on [COG functional categories](#)

Search gene, GeneID or locus_tag: Find Gene

Gene **gyrA** was found and highlighted on the gene map below.



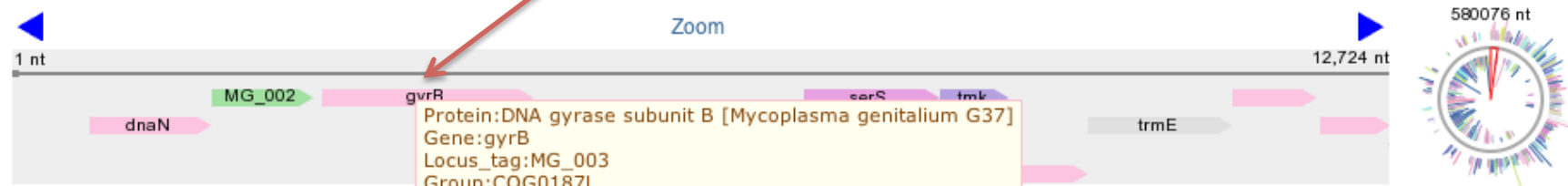
Click [here](#) for Sequence Viewer presentation (base sequence and aligned amino acids) of selected region

マウスのポインタを遺伝子の矢印にのせると、その遺伝子の情報が表示される、

Gene Classification based on [COG functional categories](#)

Search gene, GeneID or locus_tag: Find Gene

Gene **gyrA** was found and highlighted on the gene map below.



Click [here](#) for Sequence Viewer presentation (base sequence and aligned amino acids) of selected region

ここ、をクリックするとSequence Viewerで見ている周辺の領域が表示される

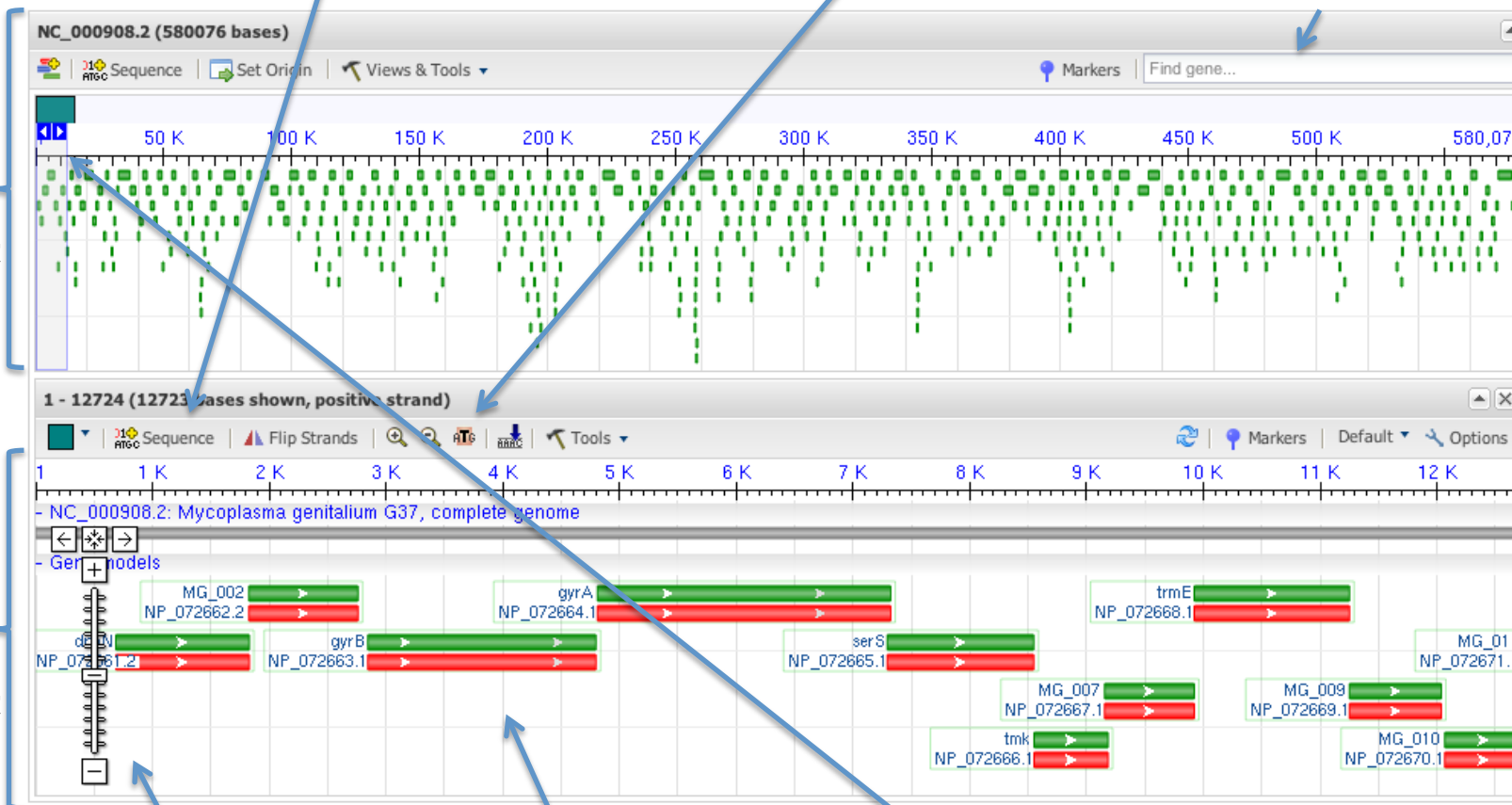
塩基配列を別ウィンドウに表示

スケール上に塩基配列の表示

遺伝子名で検索

ゲノムの
全体表示

一部を
拡大表示

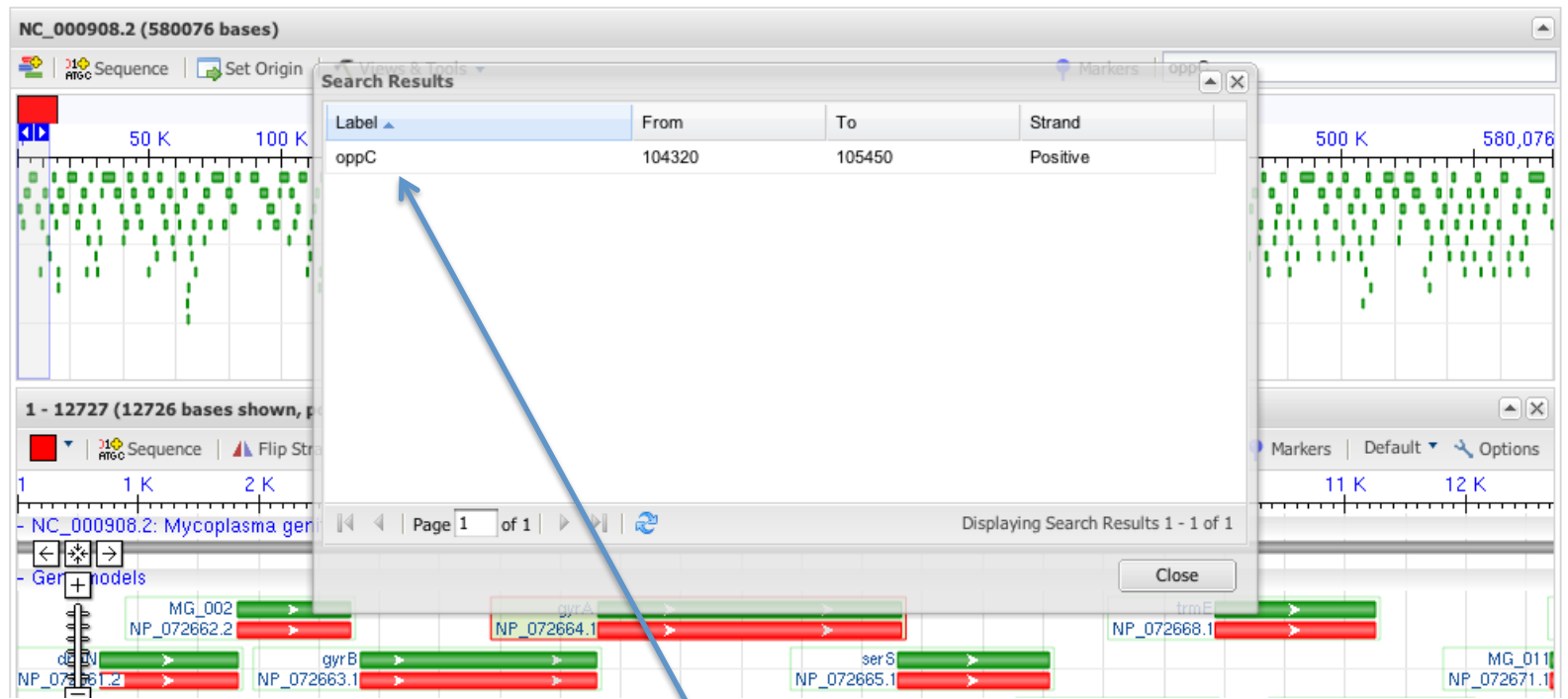
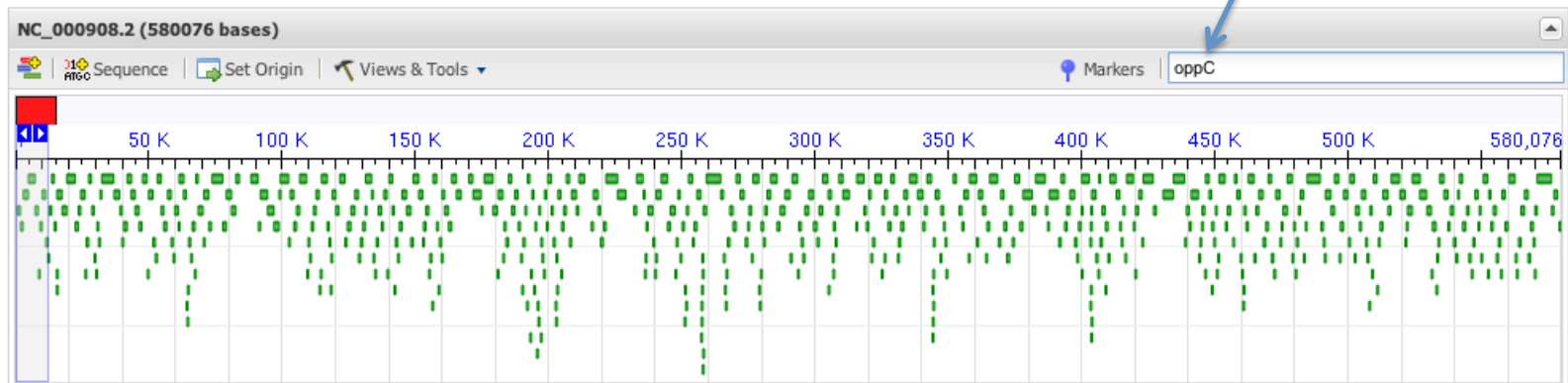


拡大率の変更

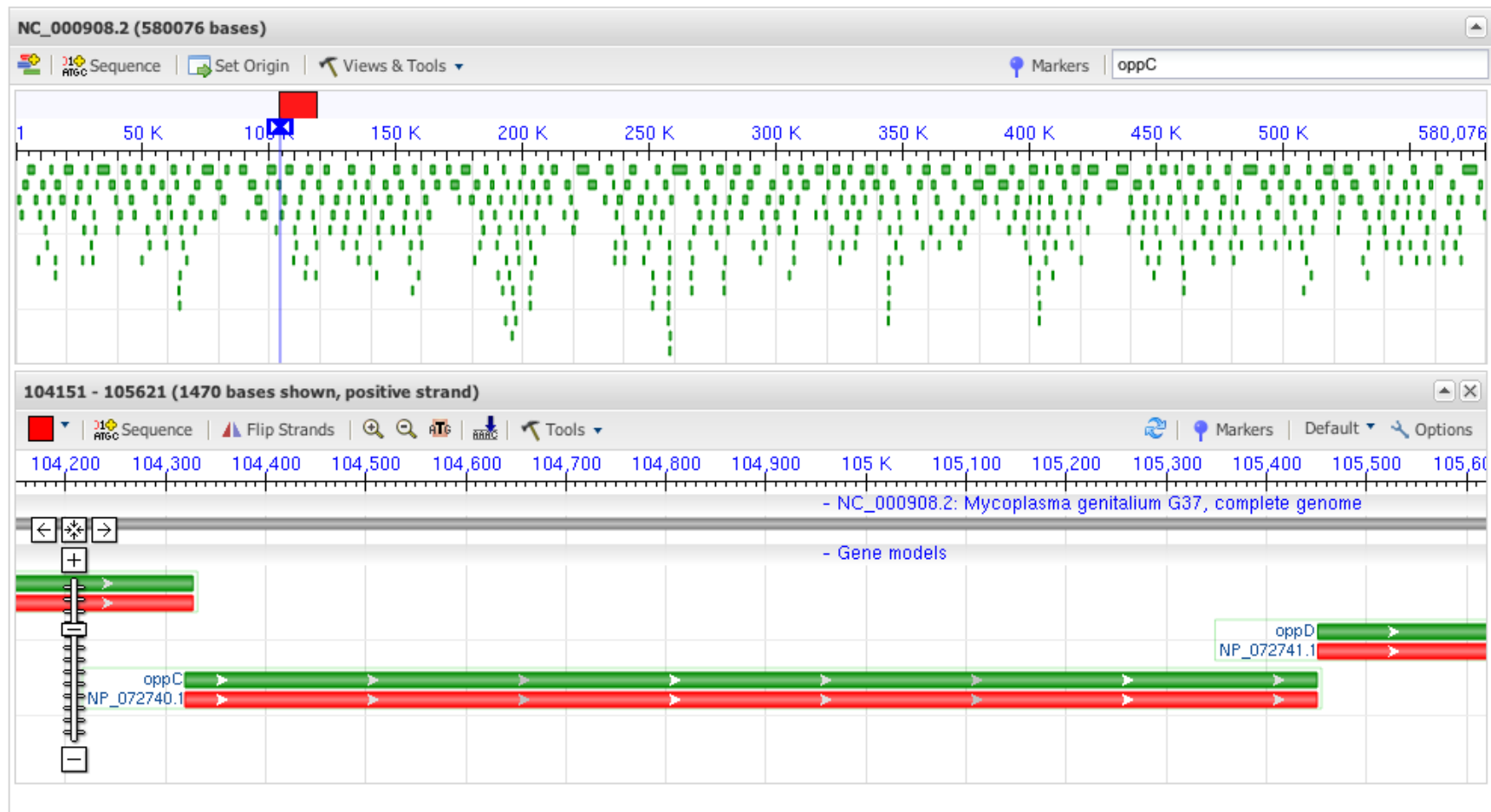
下のうす青色の四角い領域が下に
拡大表示されている
左ボタンでドラッグするとスクロール

この付近も左ドラッグでスクロールできる

遺伝子名を入力

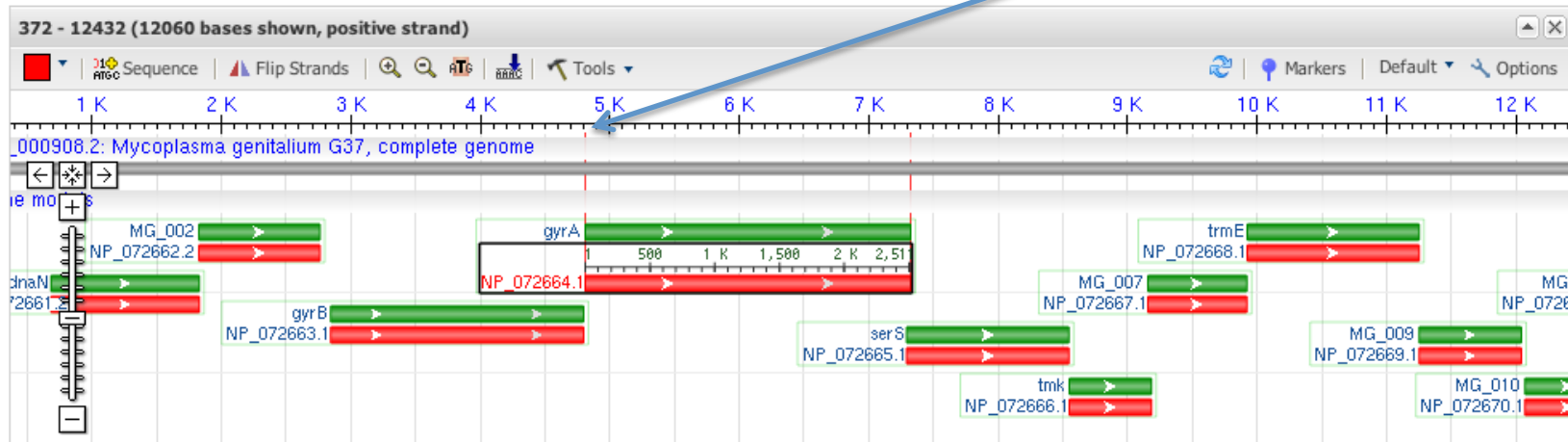


表示される一覧ダイアログから目的の遺伝子名をクリック

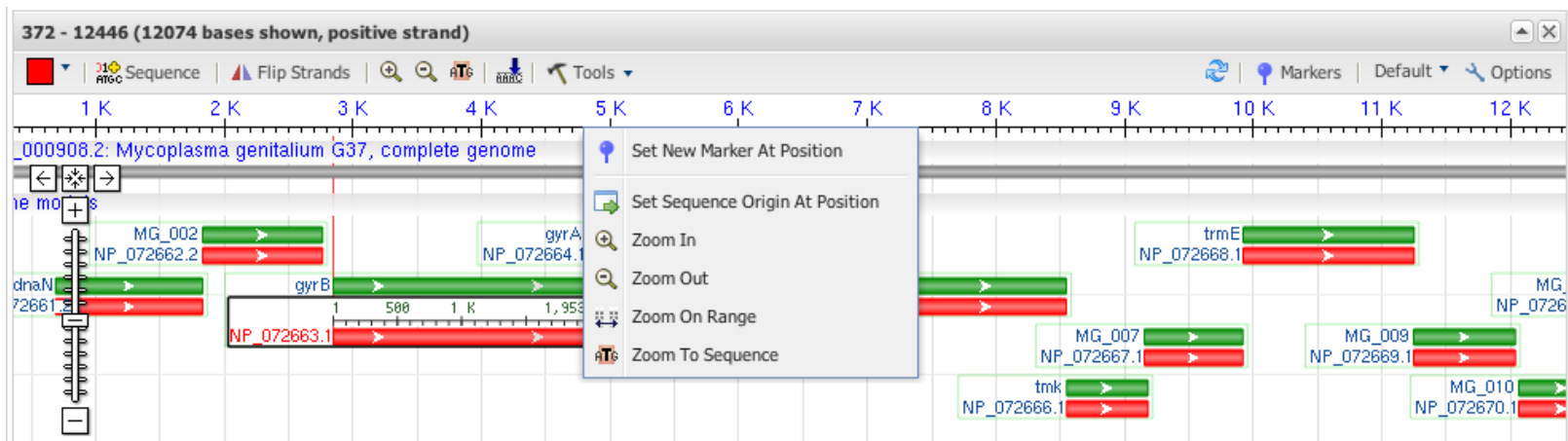


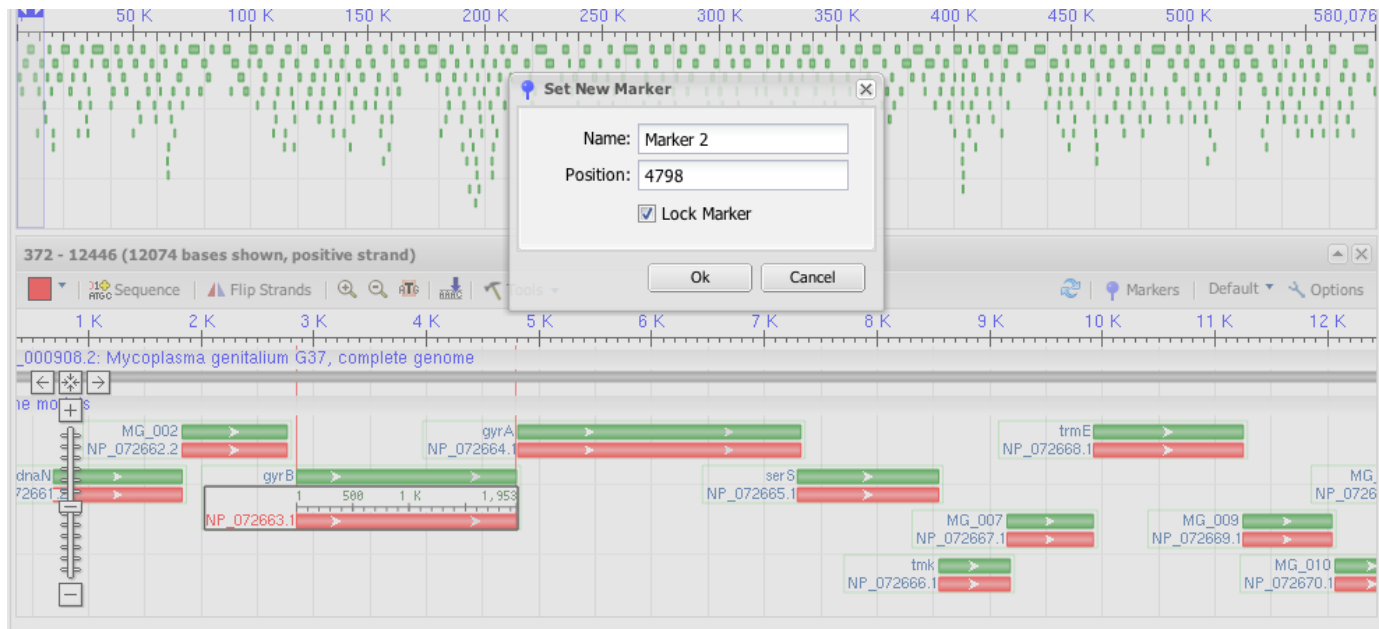
検索した遺伝子(oppC)が中央に表示される

ある遺伝子(ここではgyrA)の翻訳開始点付近の塩基配列を知りたい場合
表示したい領域にまずマーカー(Marker)を付ける。開始点付近で右クリック



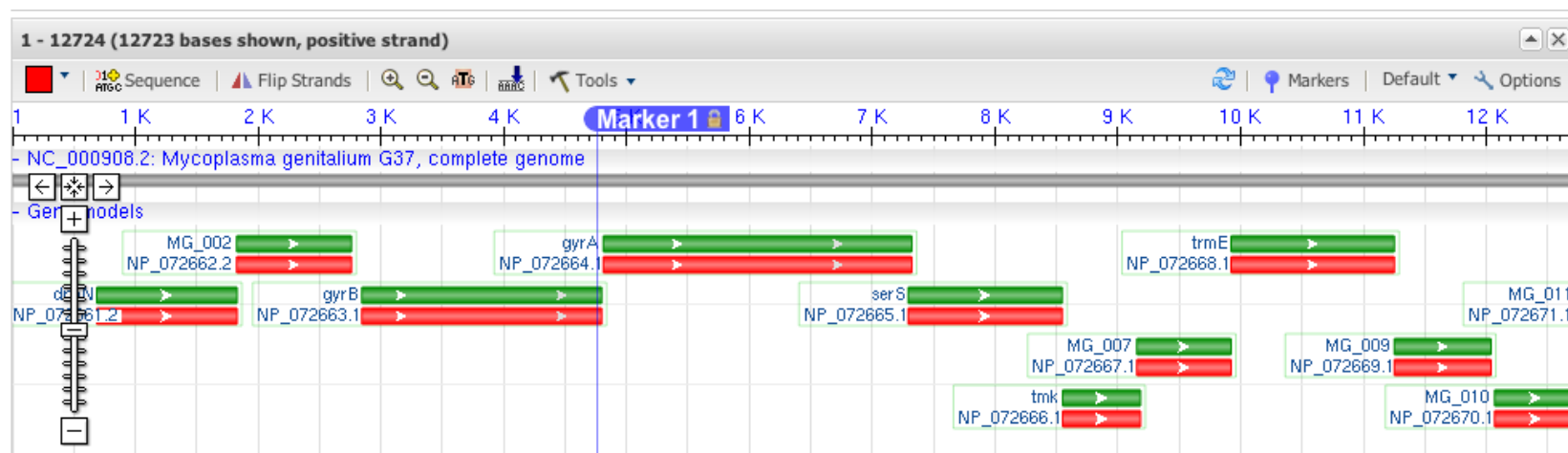
Set New Marker At Positionを選択するとマーカーが設置される

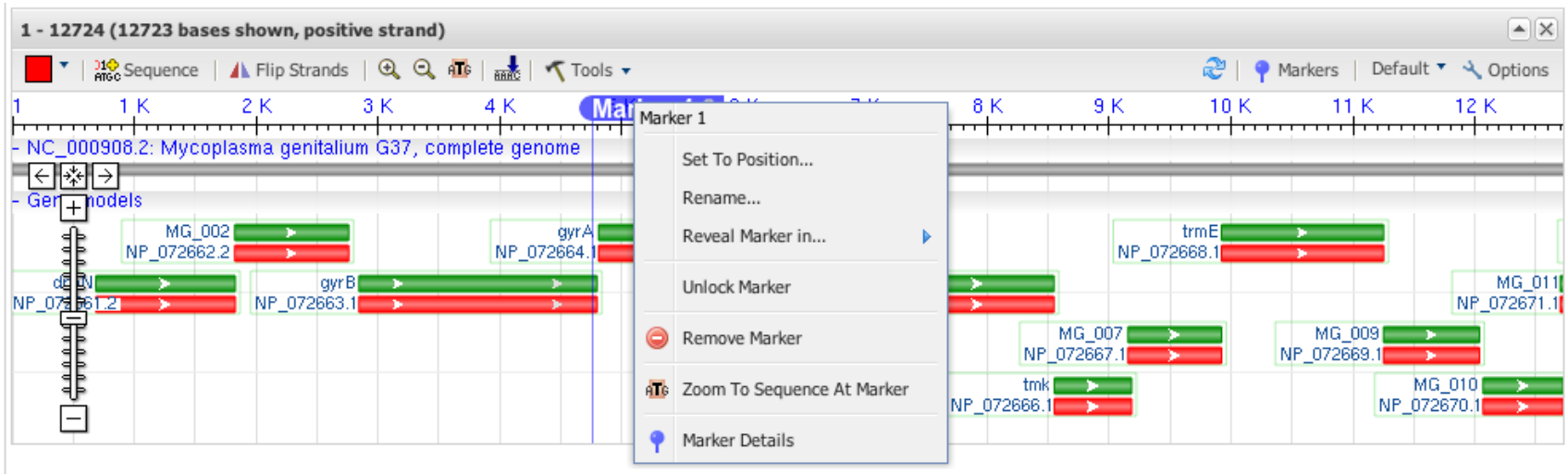




確認ダイアログでOKをクリック

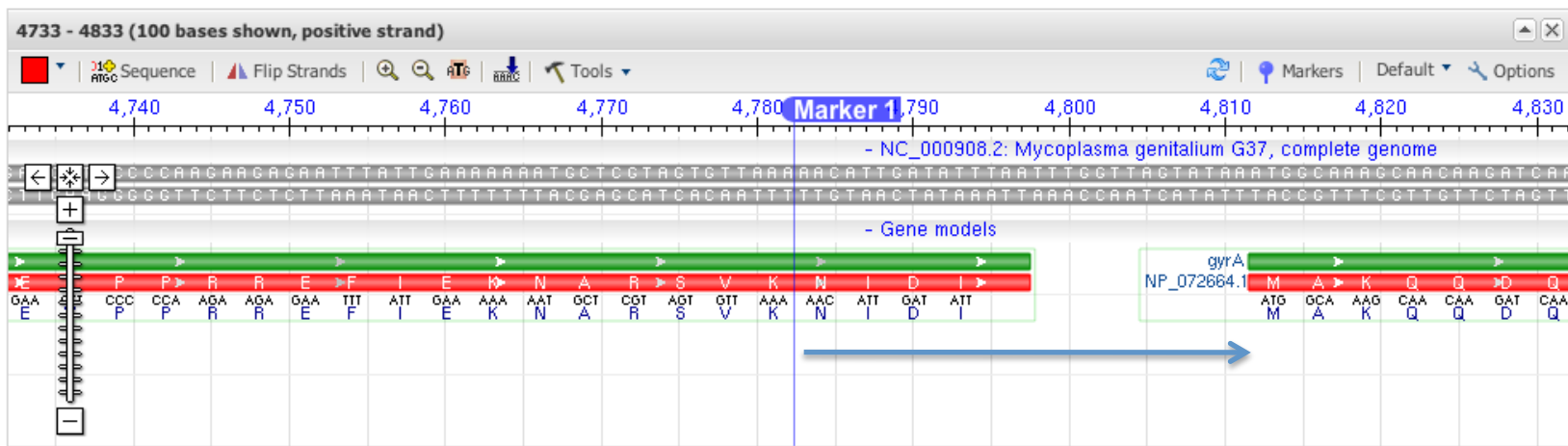
マーカーが設置される、右側に鍵マークがついている状態ではロックされているので解除する



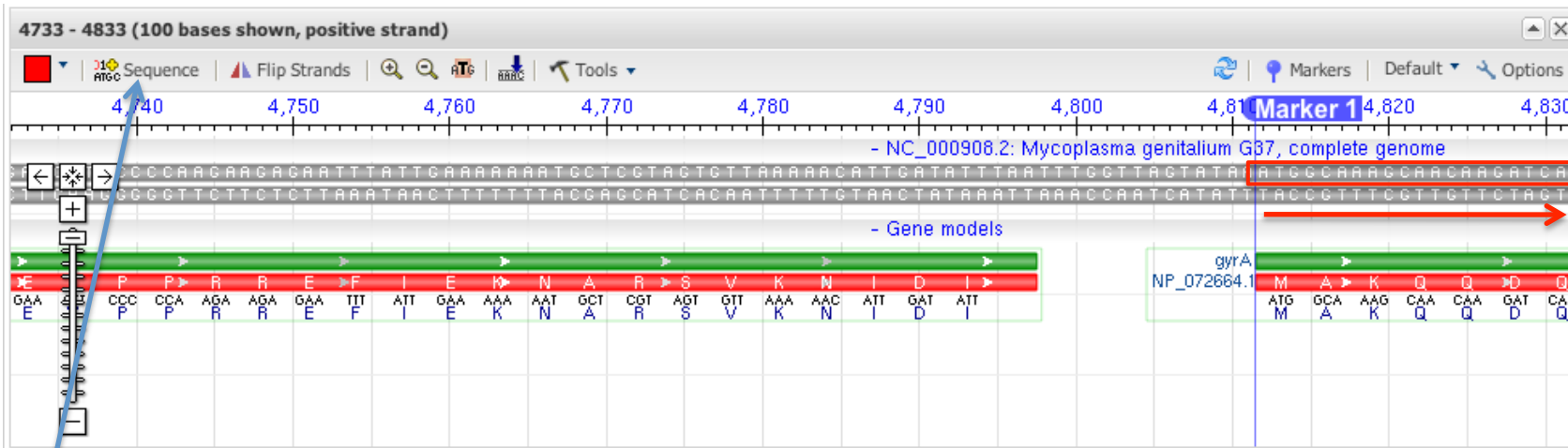


マーカー上を右クリックするとメニューが表示されるので、Unlock Markerを選択すると、ロックが解除されマーカーの位置をドラッグでスライドできる
間違っつけてマーカーはここでRemove Markerを選んで取り除くことも出来る

Zoom To Sequence At Markerでマーカー一部分が塩基配列も含めて拡大表示される



このままでも良いがgyrAの開始点にマーカーをそろえておこう、



gyrA開始点のアミノ酸配列はMAKQKQDQ,,
塩基配列は順方向なので上段を読んでATGGCAAACAACAAGAT,,と読み取れる

塩基配列が読み取りにくい場合
ここをクリックすると配列表示ウィンドウが開く

Go To Positionで配列上の位置(4800)
を指定、マーカーの位置が示される

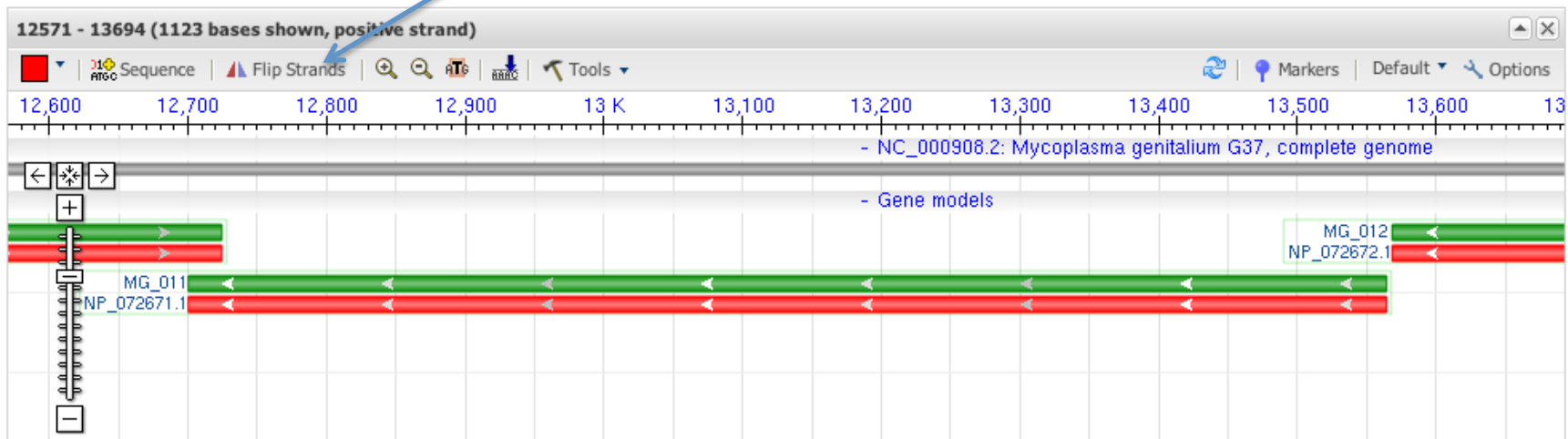


逆方向の配列を見るときには少し注意が必要である、前回見たMG_012を表示してみると

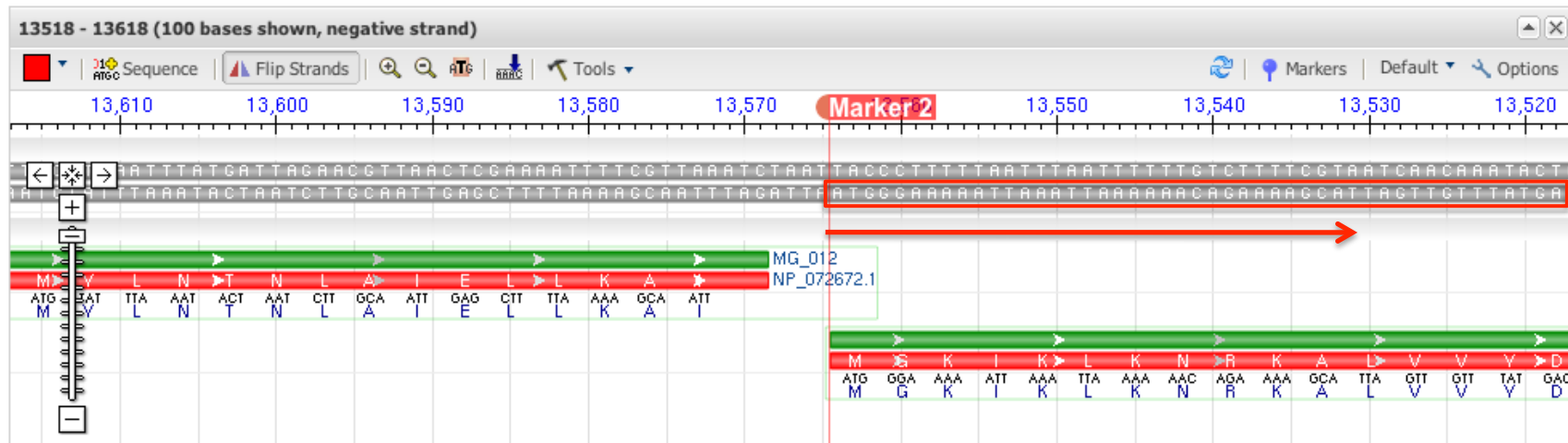


自動的に遺伝子の配置を反転してくれる、(スケール上の番号が右側が小さい)

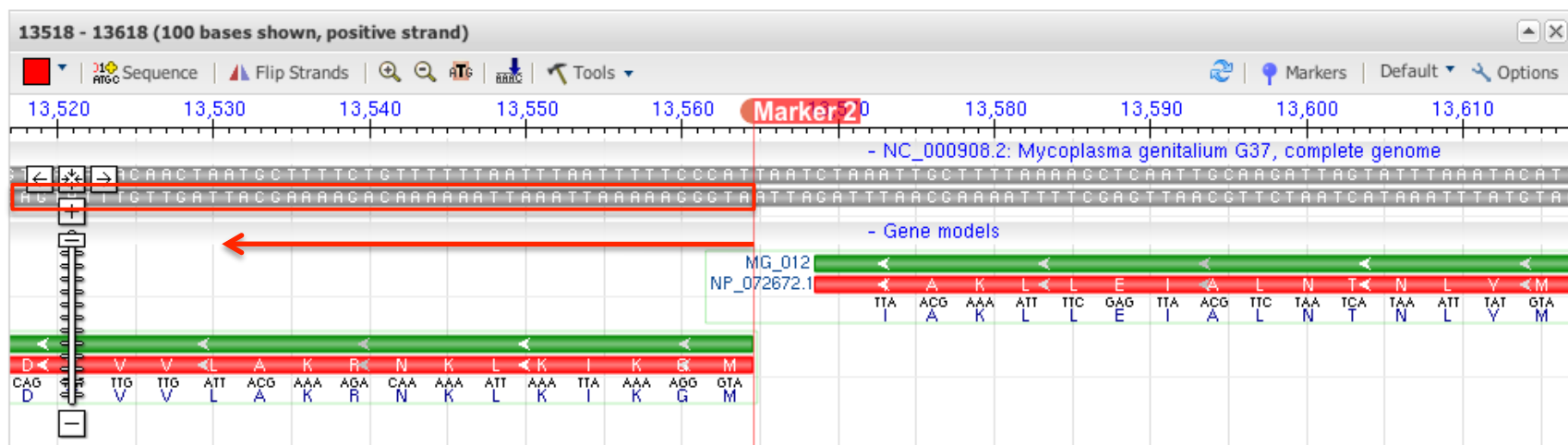
反転表示がかえって判りにくいヒトはFlipStrandsをクリックすると順方向の表示に戻せる



反転表示のままで先ほどと同様Markerを打って拡大表示、この場合アミノ酸配列はそのままMGKIK,,,と読めば良いが、塩基配列は相補鎖なので下の段を読んで、ATGGGAAAAATTAAA,,,となる点に注意



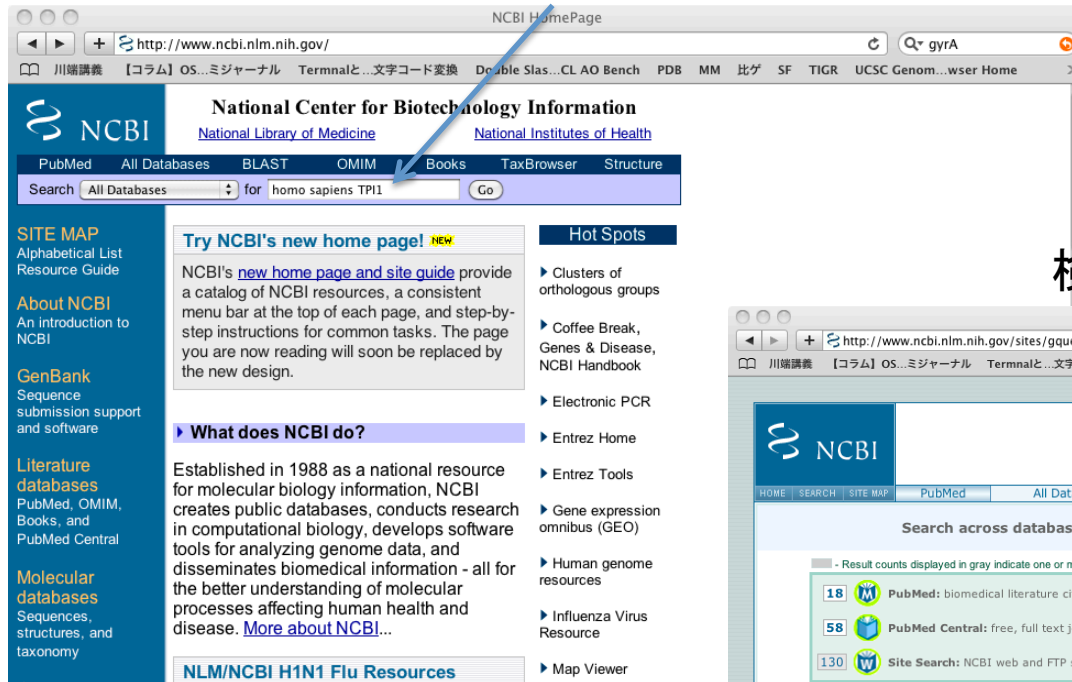
同じ部分を反転表示をしないで示すと下のようになる。アミノ酸配列を右から左へ、MGK,,,と読み、塩基配列は下の段を右から左へATGGGAAAAATTAAA,,,と読む



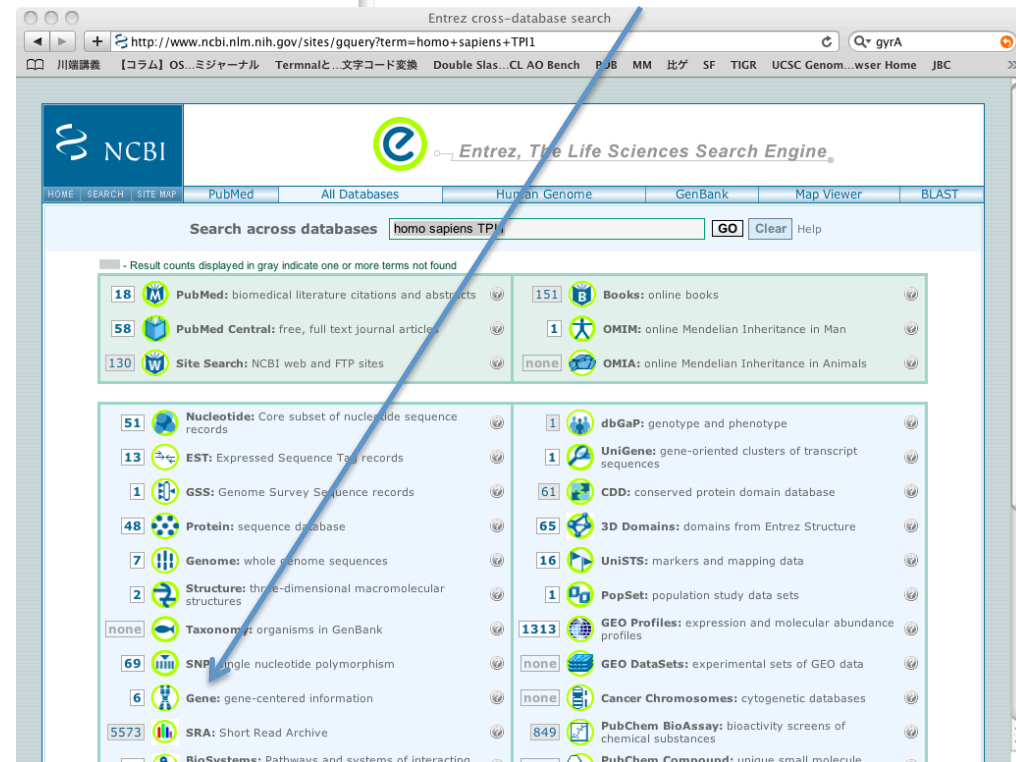
真核生物の塩基配列

ヒト (Homo sapiens) の遺伝子 (例: TPI1) を探す

NCBIのホームページで、homo sapiens TPI1として検索



検索結果でgene (遺伝子) を選択



一つ目のエントリーがヒトのTPI1

The screenshot shows the NCBI Entrez Gene search results for the query 'homo sapiens TPI1'. The browser address bar shows the URL: <http://www.ncbi.nlm.nih.gov/sites/entrez?db=gene&cmd=search&term=homo%20sapiens%20TPI1>. The search results are displayed in a table with 6 items. The first item, TPI1, is highlighted with a blue arrow pointing to its title. The details for TPI1 are as follows:

- 1: TPI1** (Official Symbol TPI1 and Name: triosephosphate isomerase 1 [*Homo sapiens*])
 - Other Aliases: MGC88108, TPI
 - Chromosome: 12; Location: 12p13
 - Annotation: Chromosome 12, NC_000012.11 (6976706..6979992)
 - MIM: 190450
 - GeneID: 7167
- 2: RCTPI1** (TPI1 pseudogene [*Homo sapiens*])
 - Chromosome: 1; Location: 1p31.1
 - Annotation: Chromosome 1, NC_000001.10 (77165449..77166665)
 - GeneID: 729708
- 3: SPSB2** (Official Symbol SPSB2 and Name: spiA/ryanodine receptor domain and SOCS box containing 2 [*Homo sapiens*])
 - Other Aliases: FLJ17395, GRCC9, MGC2519, SSB2
 - Other Designations: SPRY domain-containing SOCS box protein SSB-2; gene-rich cluster protein C9
 - Chromosome: 12; Location: 12p13.31
 - Annotation: Chromosome 12, NC_000012.11 (6980099..6982452, complement)
 - MIM: 611658
 - GeneID: 84727
- 4: CFL1** (Official Symbol CFL1 and Name: cofilin 1 (non-muscle) [*Homo sapiens*])
 - Other Aliases: CFL
 - Chromosome: 11; Location: 11q13
 - Annotation: Chromosome 11, NC_000011.9 (65622282..65625804, complement)

The 'Recent activity' panel on the right shows the following search history:

- homo sapiens TPI1 (6)
- TPI1 triosephosphate isomerase 1 [*Homo sapiens*]
- TPI1 homo dspirnd (7)
- TPI1 (55) **Gene**
- TPI1 (26) **Genome**

» See more...

タンパク質名：
Triosephosphate isomerase 1

All Databases PubMed Nucleotide Protein Genome Structure OMIM PMC Journals Books

Search Gene for Go Clear

Limits Preview/Index History Clipboard Details

Display Full Report Send to

1: TPI1 triosephosphate isomerase 1 [*Homo sapiens*]
 GeneID: 7167 updated 16-Oct-2009
 Summary

Official Symbol	TPI1	provided by HGNC
Official Full Name	triosephosphate isomerase 1	provided by HGNC
Primary Source	HGNC:12009	
See related	Ensembl:ENSG00000111669 ; HPRD:01833 ; MIM:190450	
Gene type	protein coding	
RefSeq status	REVIEWED	
Organism	Homo sapiens	
Lineage	<i>Eukaryota</i> ; <i>Metazoa</i> ; <i>Chordata</i> ; <i>Craniata</i> ; <i>Vertebrata</i> ; <i>Euteleostomi</i> ; <i>Mammalia</i> ; <i>Eutheria</i> ; <i>Euarchontoglires</i> ; <i>Primates</i> ; <i>Haplorrhini</i> ; <i>Catarrhini</i> ; <i>Hominidae</i> ; <i>Homo</i>	
Also known as	TPI; MGC88108; TPI1	
Summary	This gene encodes an enzyme, consisting of two identical proteins, which catalyzes the isomerization of glyceraldehydes 3-phosphate (G3P) and dihydroxy-acetone phosphate (DHAP) in glycolysis and gluconeogenesis. Mutations in this gene are associated with triosephosphate isomerase deficiency. Pseudogenes have been identified on chromosomes 1, 4, 6 and 7. Alternative splicing results in multiple transcript variants. [provided by RefSeq]	

遺伝子の構成
7つのコーディング領域
:エキソン

Genomic regions, transcripts, and products

(plus) Go to [reference sequence details](#) [Try our new Sequence Viewer](#)



ここをクリックして
Sequence viewerを起動

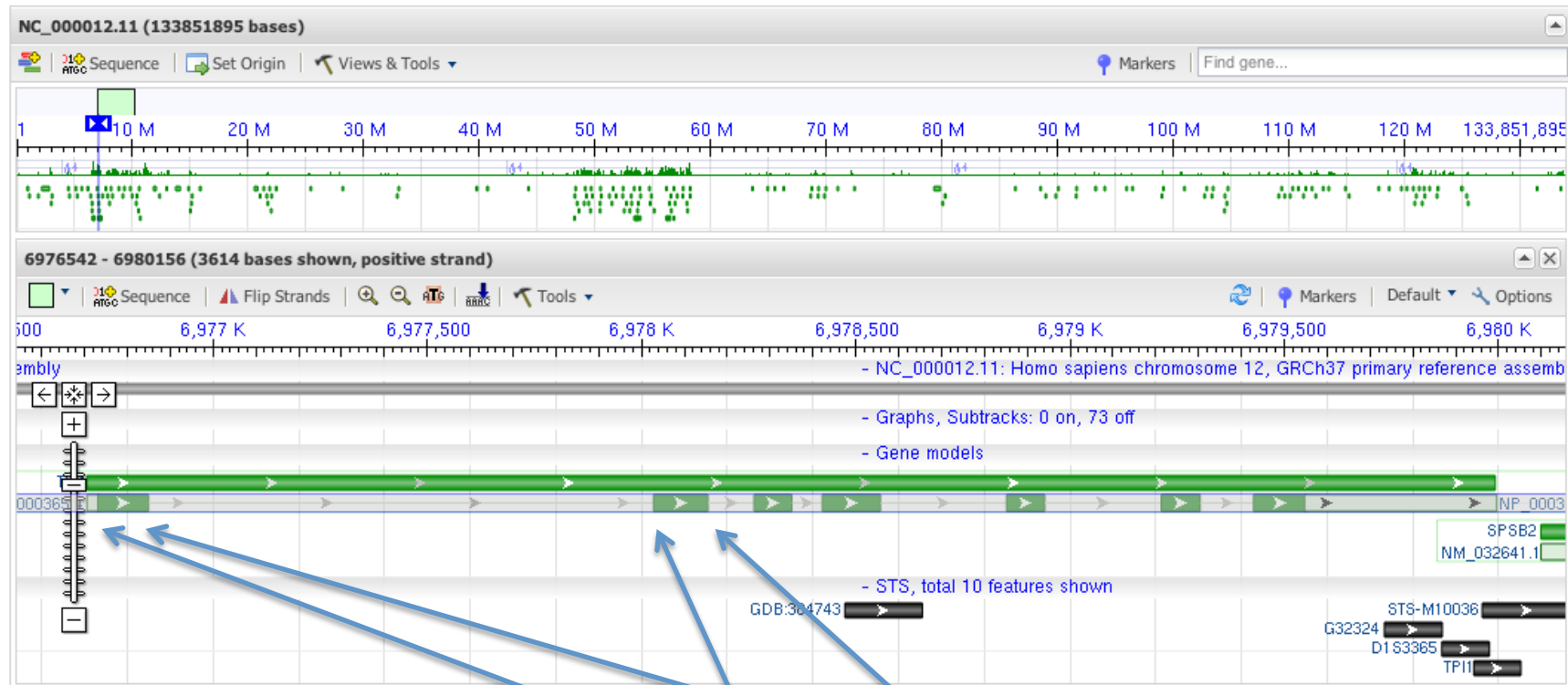
Bibliography

Sequence Viewerが立ち上がる、 TPI1は12番染色体上にある、

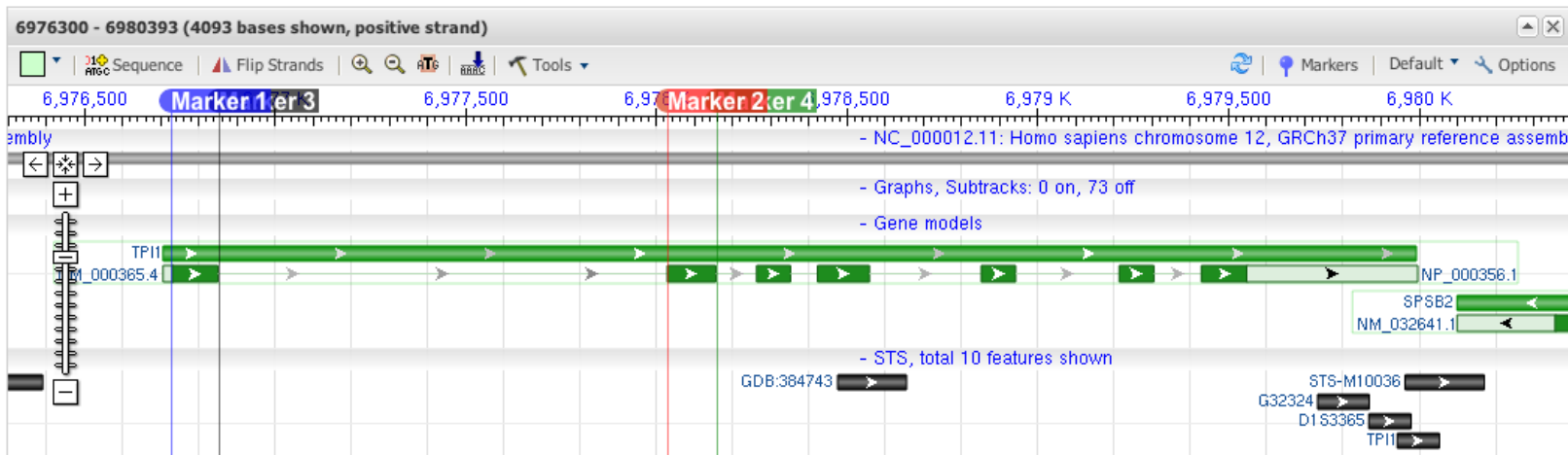
NCBI Reference Sequence: NC_000012.11

Homo sapiens chromosome 12, GRCh37 primary reference assembly

[Link To This Page](#) | [Help](#) | [Feedback](#) | [Printer-Friendly Page](#)

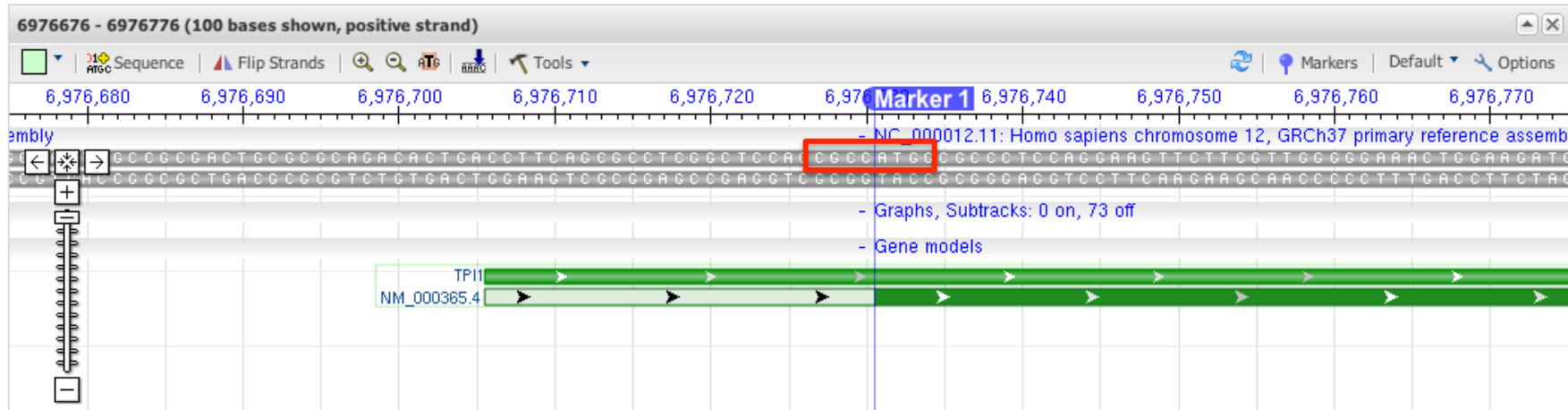


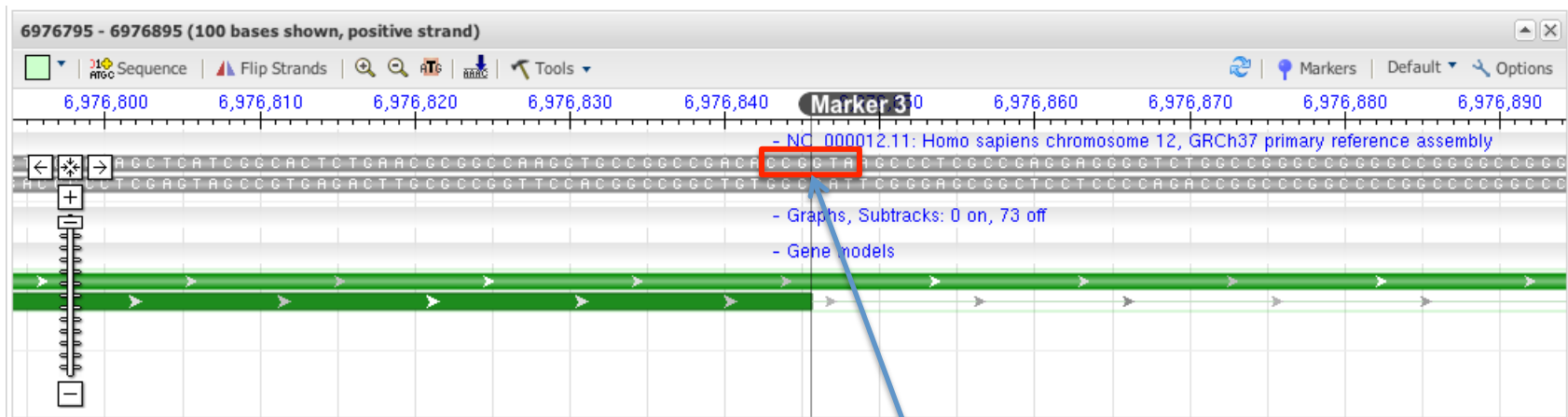
第一エクソンと第二エクソンの開始点、と終止点にマーカーを打つ



4カ所のマーカーを設定した状態

第一エクソンの開始点の前後の配列: GCC | ATG





第一エキソンの終止点

ATP5A1とATP5Bについて同様に、おこなう

相補鎖に注意