

# OMP25蛋白的序列结构功能分析

汇报人：曹小安

G10组员：田 鹏、李 坤、  
冯 丹、曹小安

# 汇报内容

- 研究背景和意义
- 序列的分析
- 蛋白功能与结构分析
- 致谢

# 研究背景和意义

- 布鲁氏菌病是一种严重的人兽共患性传染病，其病原兼性寄细胞内寄生，目前用于动物免疫接种的疫苗全为弱毒活疫苗，均能感染人并产生致病性；大量研究表明，细菌脂多糖、外膜蛋白群和T4分泌系统是该病原感染宿主和产生免疫反应的主要抗原；本研究试图用生物信息学工具对其多个基因和免疫抗原进行筛选，进行表位肽疫苗的研究。下面就以细菌外膜蛋白OMP25为例做分析和讨论。

# 序列的分析

UniProt > UniProtKB Downloads · Contact · Documentation/Help

Search Blast Align Retrieve ID Mapping \*

Search in  Query

9 results for family:omp25 in UniProtKB sorted by score descending

[Browse by taxonomy, keyword, gene ontology, enzyme class or pathway](#) | [Reduce sequence redundancy to 100%, 90% or 50%](#)

Page 1 of 1

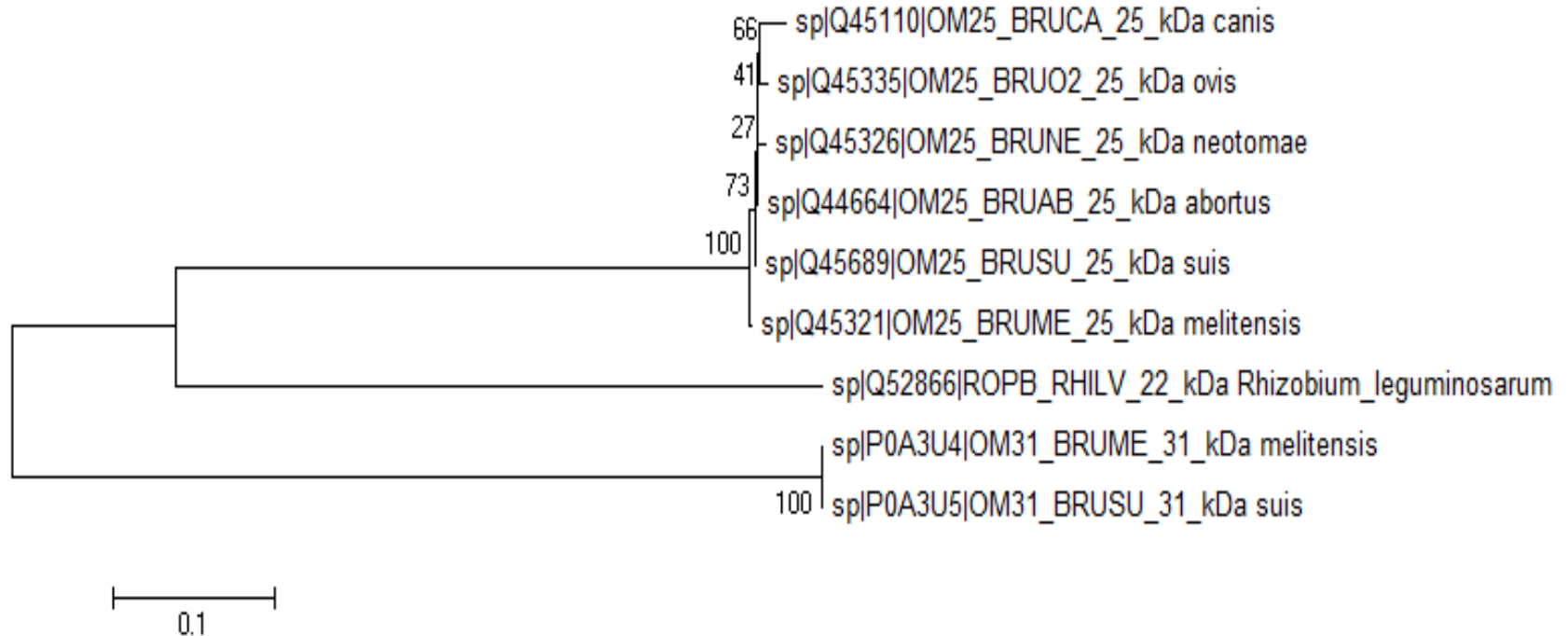
## Results

› Add columns: [Protein families](#)

Entry	Entry name	Status	Protein names	Gene names	Organism	Length
<input type="checkbox"/> Q44664	OM25_BRUAB	★	25 kDa outer-membrane immunogenic protein	omp25 BruAb1_0720	Brucella abortus biovar 1 (strain 9-941)	213
<input type="checkbox"/> Q45321	OM25_BRUME	★	25 kDa outer-membrane immunogenic protein	omp25 BMEI1249	Brucella melitensis biotype 1 (strain 16M / ATCC 23456 / NCTC 10094)	213
<input type="checkbox"/> Q45335	OM25_BRUO2	★	25 kDa outer-membrane immunogenic protein	omp25 BOV_0692	Brucella ovis (strain ATCC 25840 / 63/290 / NCTC 10512)	201
<input type="checkbox"/> Q45689	OM25_BRUSU	★	25 kDa outer-membrane immunogenic protein	omp25 BR0701 BS1330_I0697	Brucella suis biovar 1 (strain 1330)	213
<input type="checkbox"/> P0A3U4	OM31_BRUME	★	31 kDa outer-membrane immunogenic protein	omp31 BMEI0844	Brucella melitensis biotype 1 (strain 16M / ATCC 23456 / NCTC 10094)	240
<input type="checkbox"/> P0A3U5	OM31_BRUSU	★	31 kDa outer-membrane immunogenic protein	omp31 omp31-2 BRA0423 BS1330_I10420	Brucella suis biovar 1 (strain 1330)	240
<input type="checkbox"/> Q45110	OM25_BRUCA	★	25 kDa outer-membrane immunogenic protein	omp25	Brucella canis	213
<input type="checkbox"/> Q45326	OM25_BRUNE	★	25 kDa outer-membrane immunogenic protein	omp25	Brucella neotomae	213
<input type="checkbox"/> Q52866	ROPB_RHILV	★	22 kDa outer membrane protein	ropB	Rhizobium leguminosarum bv. viciae	211

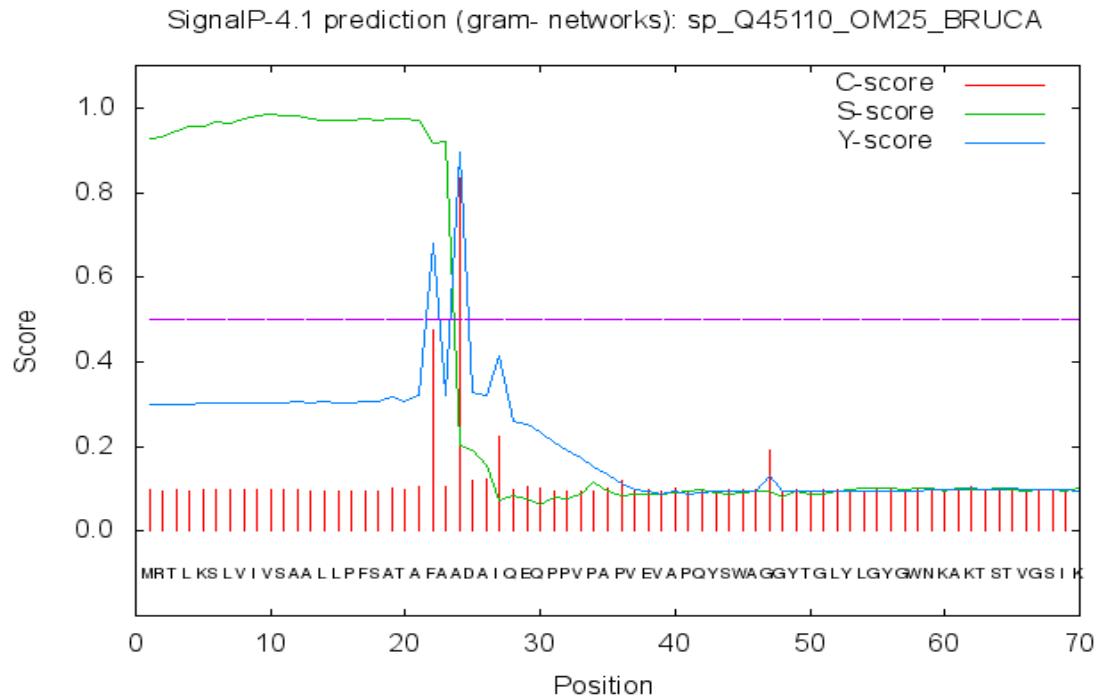
对OMP25蛋白家族swiss-prot搜索，有9个结果。

# 进化树分析



# 信号肽分析

```
# SignalP-4.1 gram- predictions  
>sp_Q45110_OM25_BRUCA 25 kDa outer_membrane immunogenic protein OS_Brucella canis GN_omp25 PE_3 SV_1
```

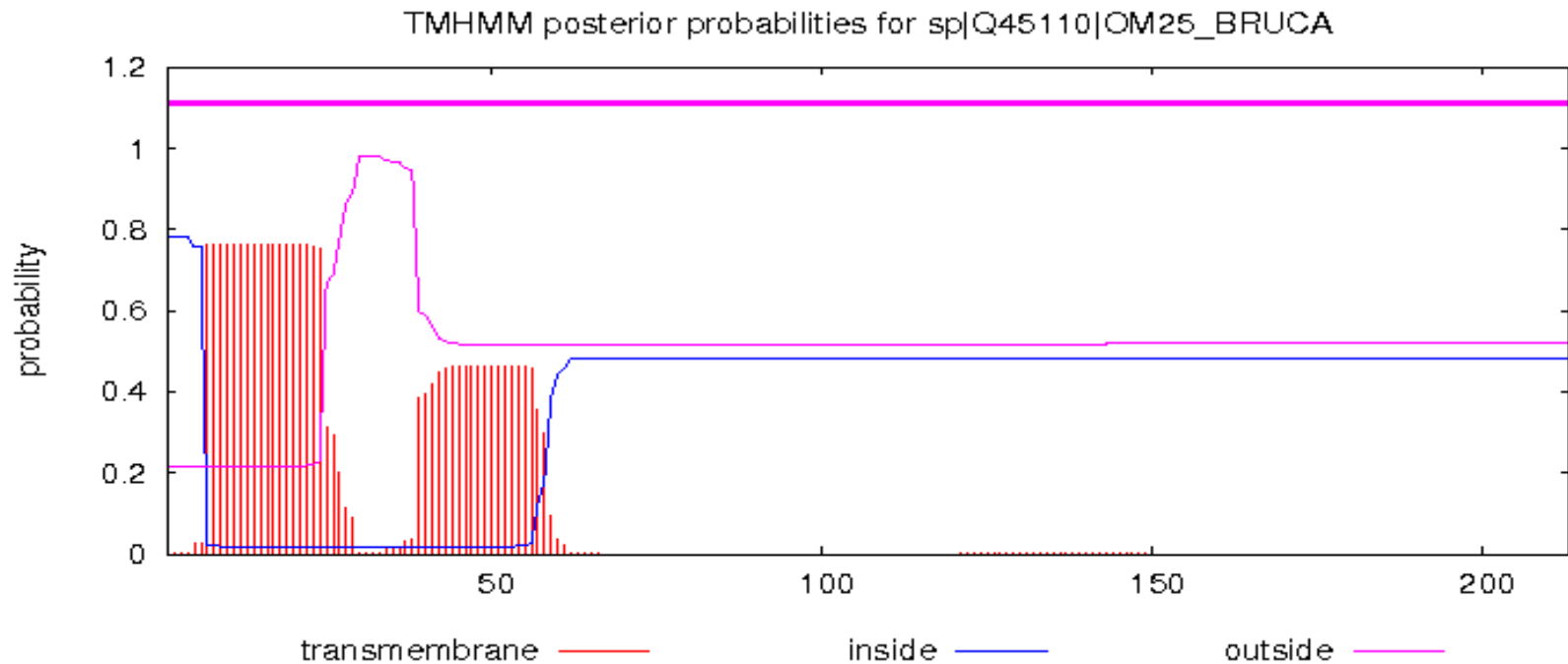


```
# Measure Position Value Cutoff signal peptide?  
max. C 24 0.835  
max. Y 24 0.897  
max. S 10 0.984  
mean S 1-23 0.963  
D 1-23 0.928 0.570 YES  
Name=sp_Q45110_OM25_BRUCA SP='YES' Cleavage site between pos. 23 and 24: AFA-AD D=0.928 D-cutoff=0.570 Networks=SignalP-noTM
```

# 跨膜区

```
# sp|Q45110|OM25_BRUCA Length: 213
# sp|Q45110|OM25_BRUCA Number of predicted TMHs: 0
# sp|Q45110|OM25_BRUCA Exp number of AAs in TMHs: 23.85643
# sp|Q45110|OM25_BRUCA Exp number, first 60 AAs: 23.80694
# sp|Q45110|OM25_BRUCA Total prob of N-in: 0.78267
# sp|Q45110|OM25_BRUCA POSSIBLE N-term signal sequence
sp|Q45110|OM25_BRUCA TMHMM2.0 outside 1 213
```

ppmtogif: computing colormap... ppmtogif: 5 colors found





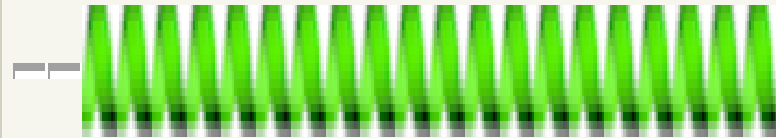


1 . . . . . 10 . . . . . 20 . . . . . 30

Sequence

M R T L K S L V I V S A A L L P F S A T A F A A D A I Q E Q P

Secondary structure



SS confidence



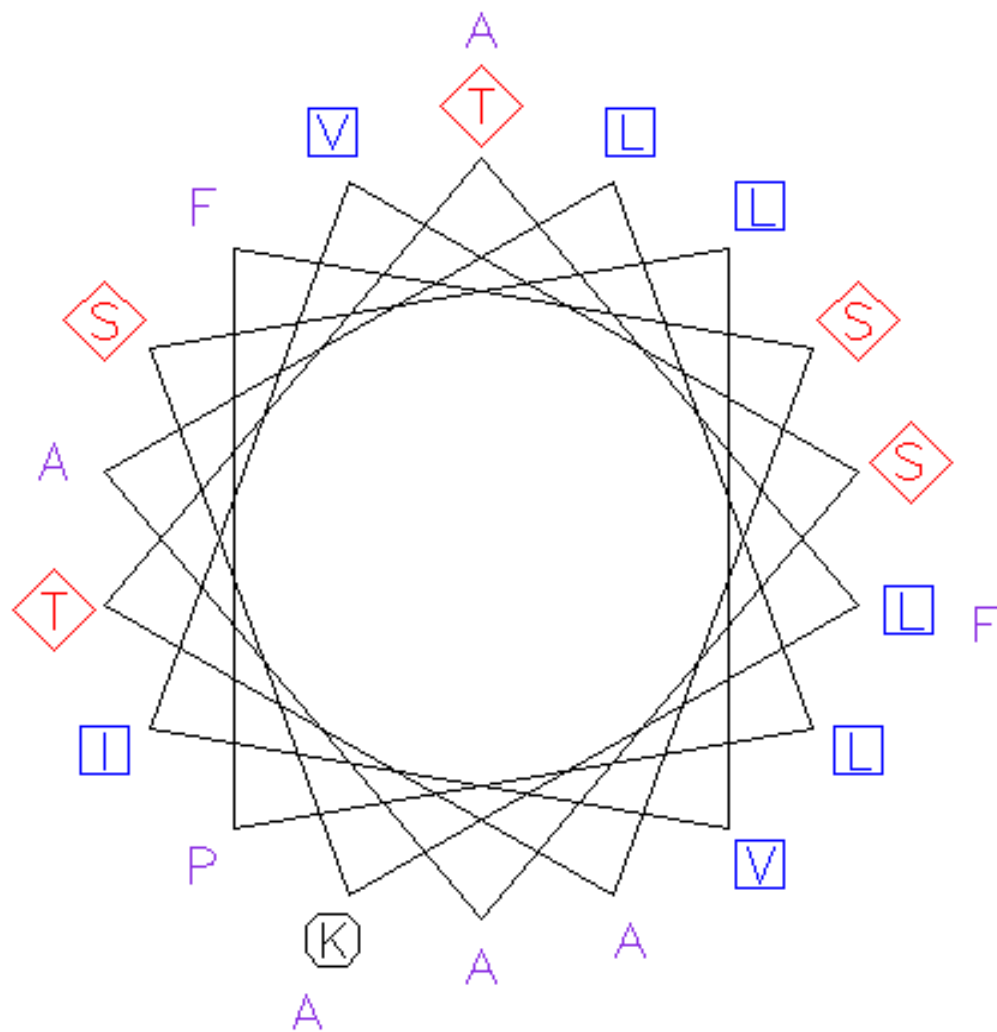
Disorder



Disorder confidence



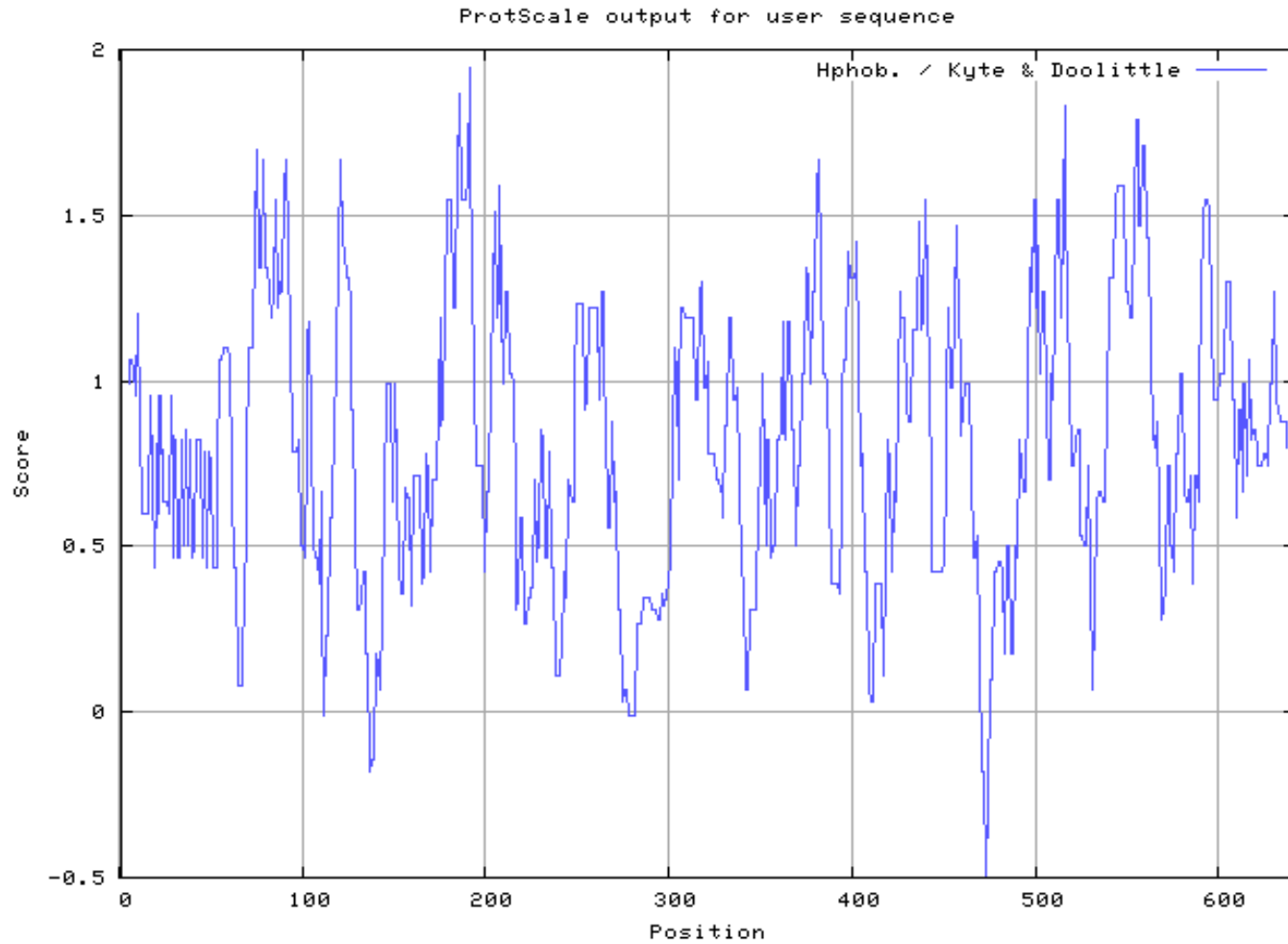
# 螺旋轮



# 氨基酸的组成

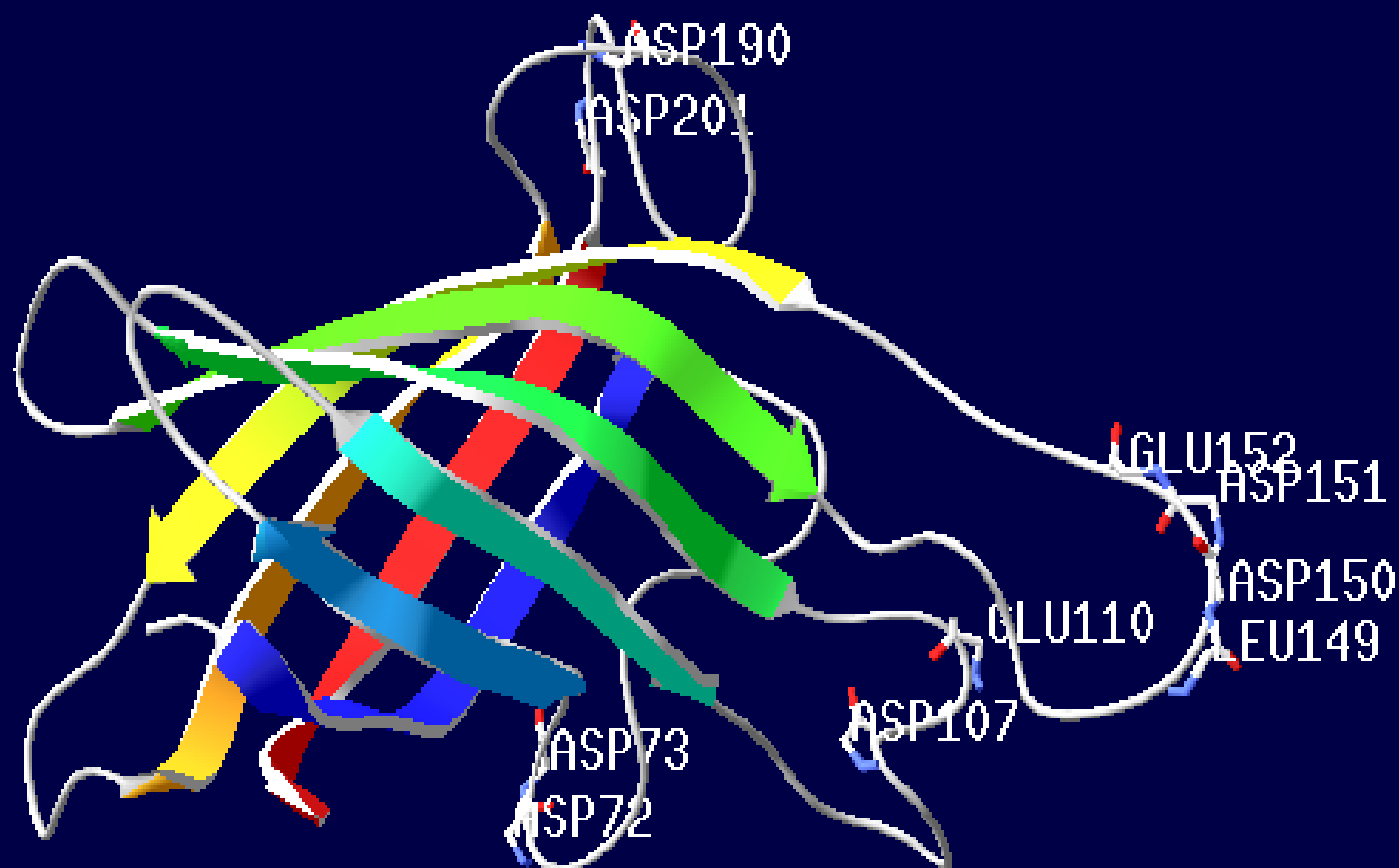
Property	Residues	Number	Mole% <sup>↓</sup>
Tiny	(A+C+G+S+T)	73	34.272 <sup>↓</sup>
Small	(A+B+C+D+G+N+P+S+T+V)	118	55.399 <sup>↓</sup>
Aliphatic	(A+I+L+V)	64	30.047 <sup>↓</sup>
Aromatic	(F+H+W+Y)	26	12.207 <sup>↓</sup>
Non-polar	(A+C+F+G+I+L+M+P+V+W+Y)	127	59.624 <sup>↓</sup>
Polar	(D+E+H+K+N+Q+R+S+T+Z)	86	40.376 <sup>↓</sup>
Charged	(B+D+E+H+K+R+Z)	44	20.657 <sup>↓</sup>
Basic	(H+K+R)	24	11.268 <sup>↓</sup>
Acidic	(B+D+E+Z)	20	9.390 <sup>↓</sup>

# 疏水性

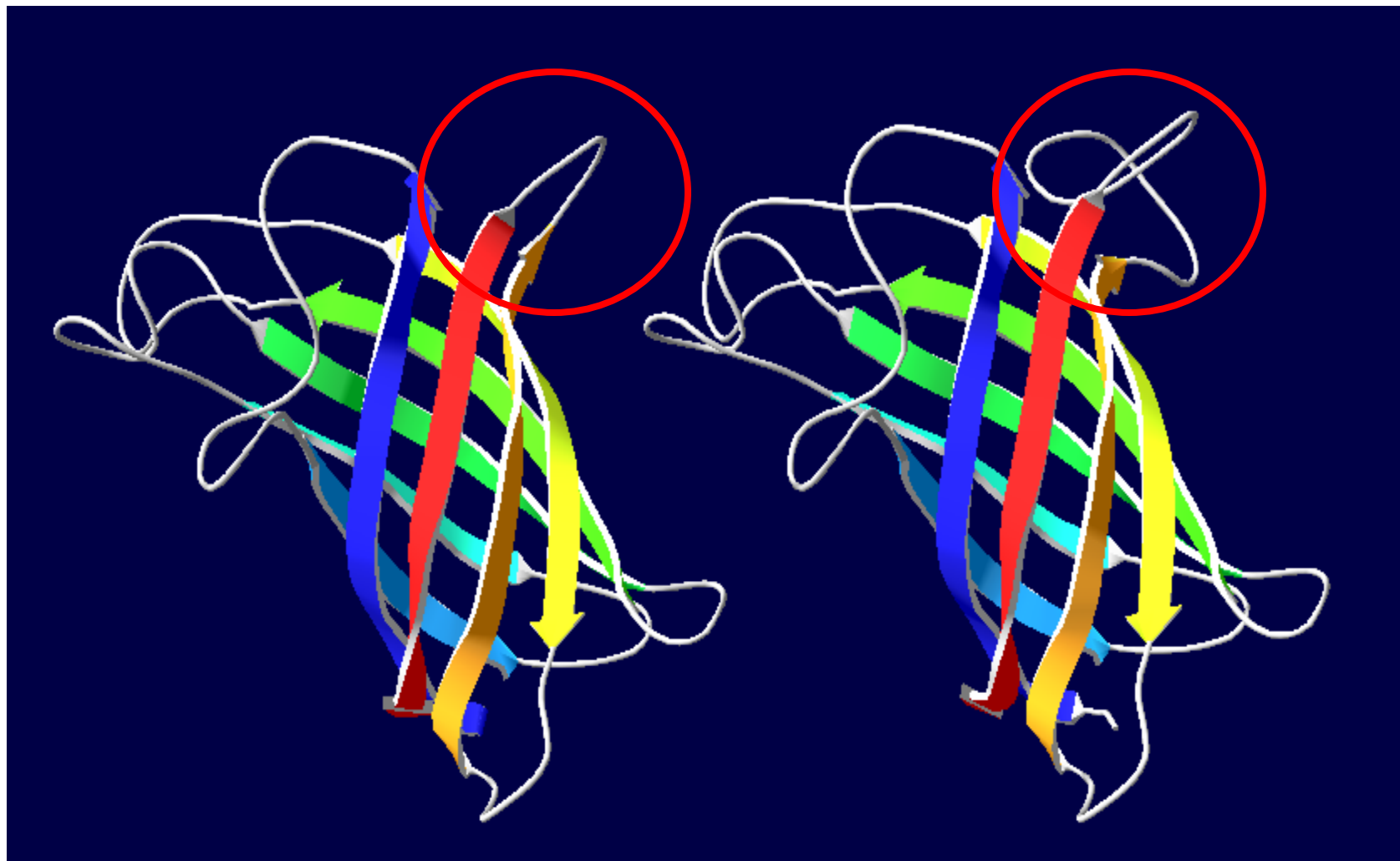


# 高级结构预测





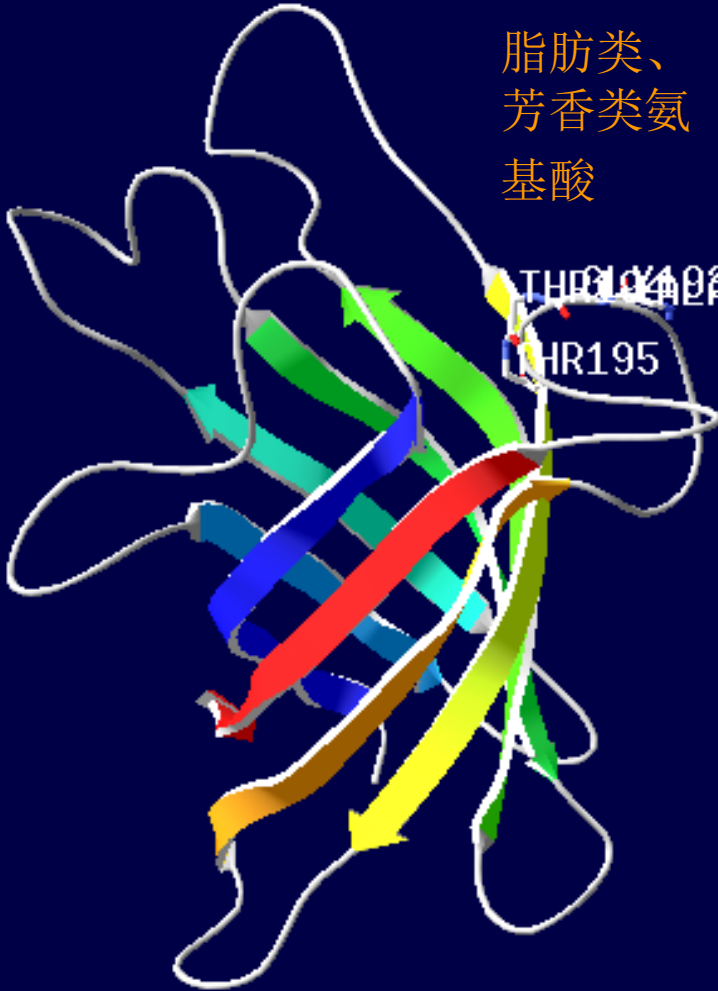






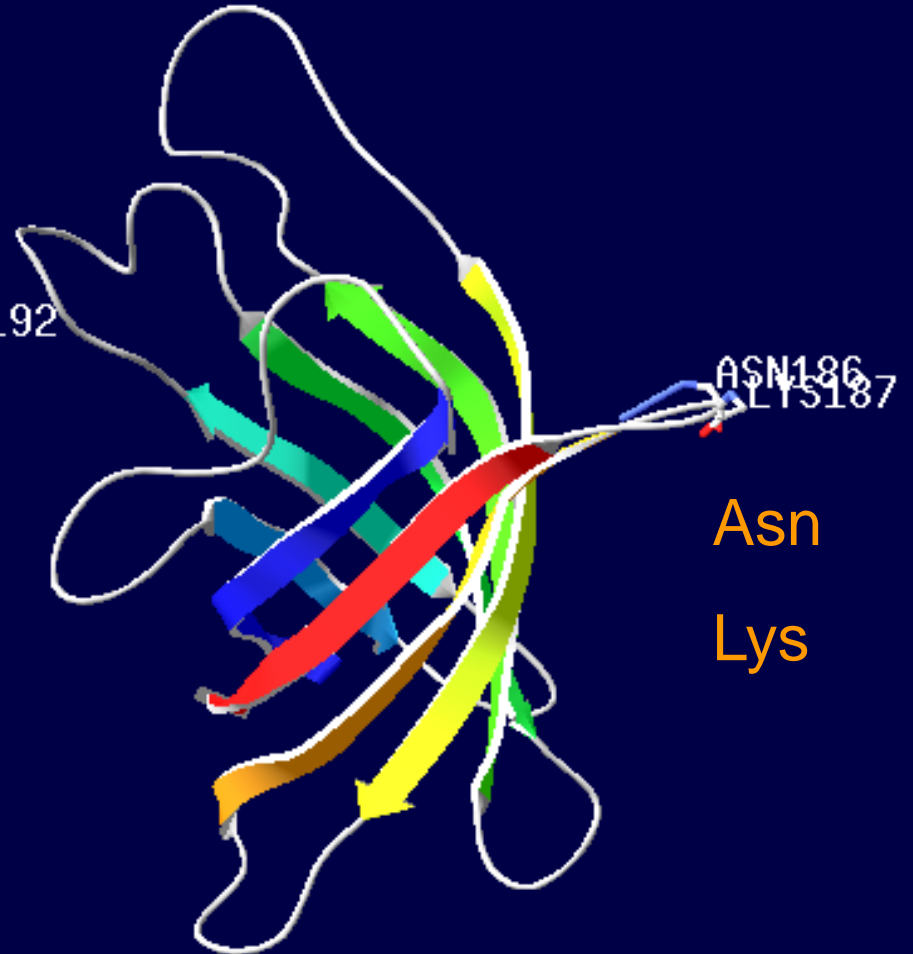
脂肪类、  
芳香类氨  
基酸

THR194  
THR195  
ASP192

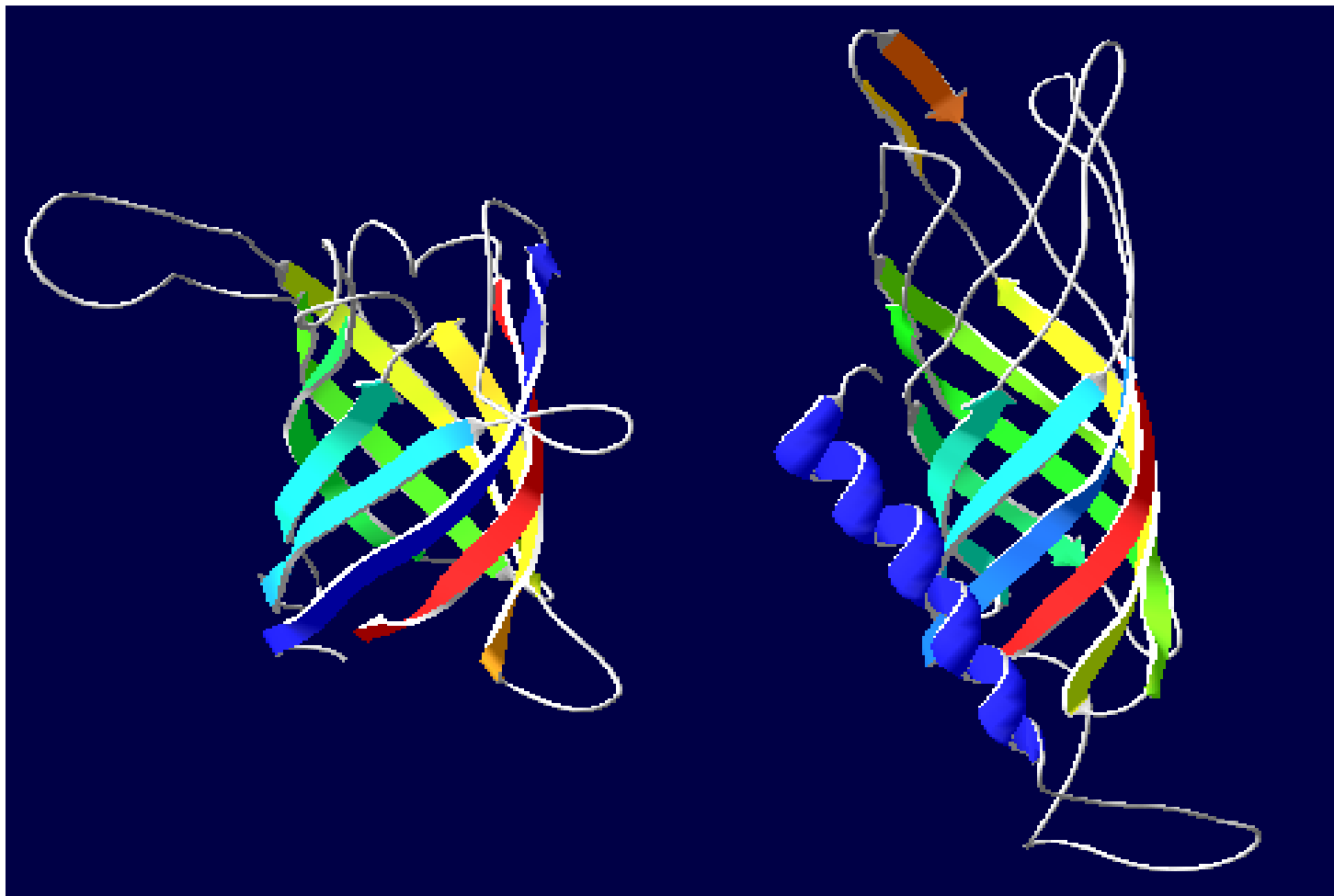


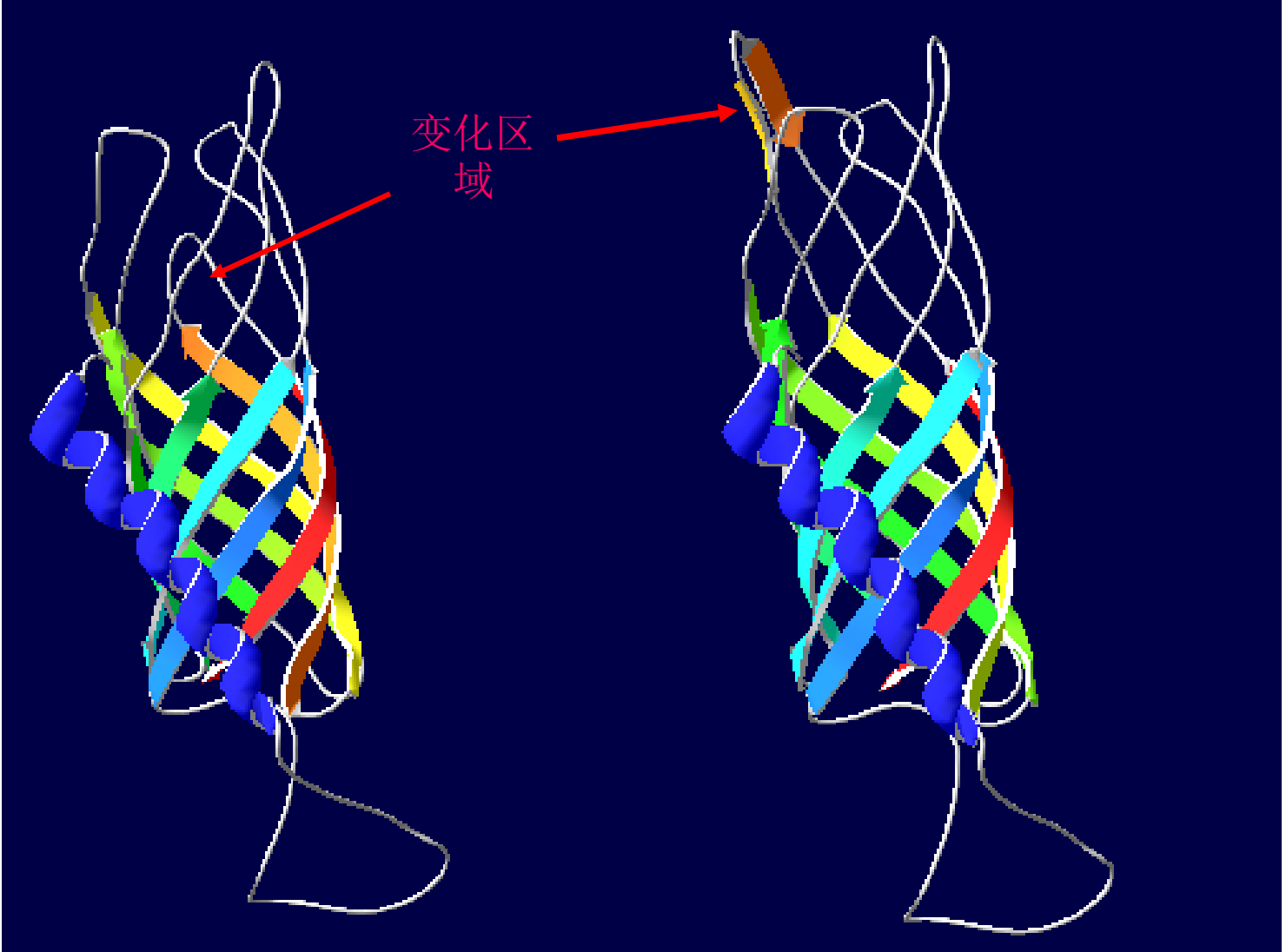
ASN186  
LYS187

Asn  
Lys



# 不同方法模型比较





# 抗原表位

- 可能的抗原表位：
- 第一段： 59-76：  
NKAKTSTVGSIKPDDWKA
- 第二段： 100-110： SWAKKSKDGLE
- 第三段： 141-157： IKLNNGLDGESKF
- 第四段： 187-201： KNYDLAGTTVRNKLD

# 体会

- 正如罗老师刚开课时讲的那样，最好是带着自己的课题来上课。我认为，在自己学习过程中，不断思考，将所学的东西融入自己的课题，不断整理和评估自己课题的设计，这样通过学习既能找到想要的答案，也能使自己的思路越来越明朗。逐步使自己的试验得到完善。

# 致谢

- 感谢罗老师几个月的教导；
- 感谢我们组成员：李坤、田鹏和冯丹；一起讨论，相互学习与进步；
- 感谢任磊及班级其他人，在软件、技术和方法等方面的交流和帮助。

# 美丽的兰州



古丝绸之路要地



黄河穿城而过





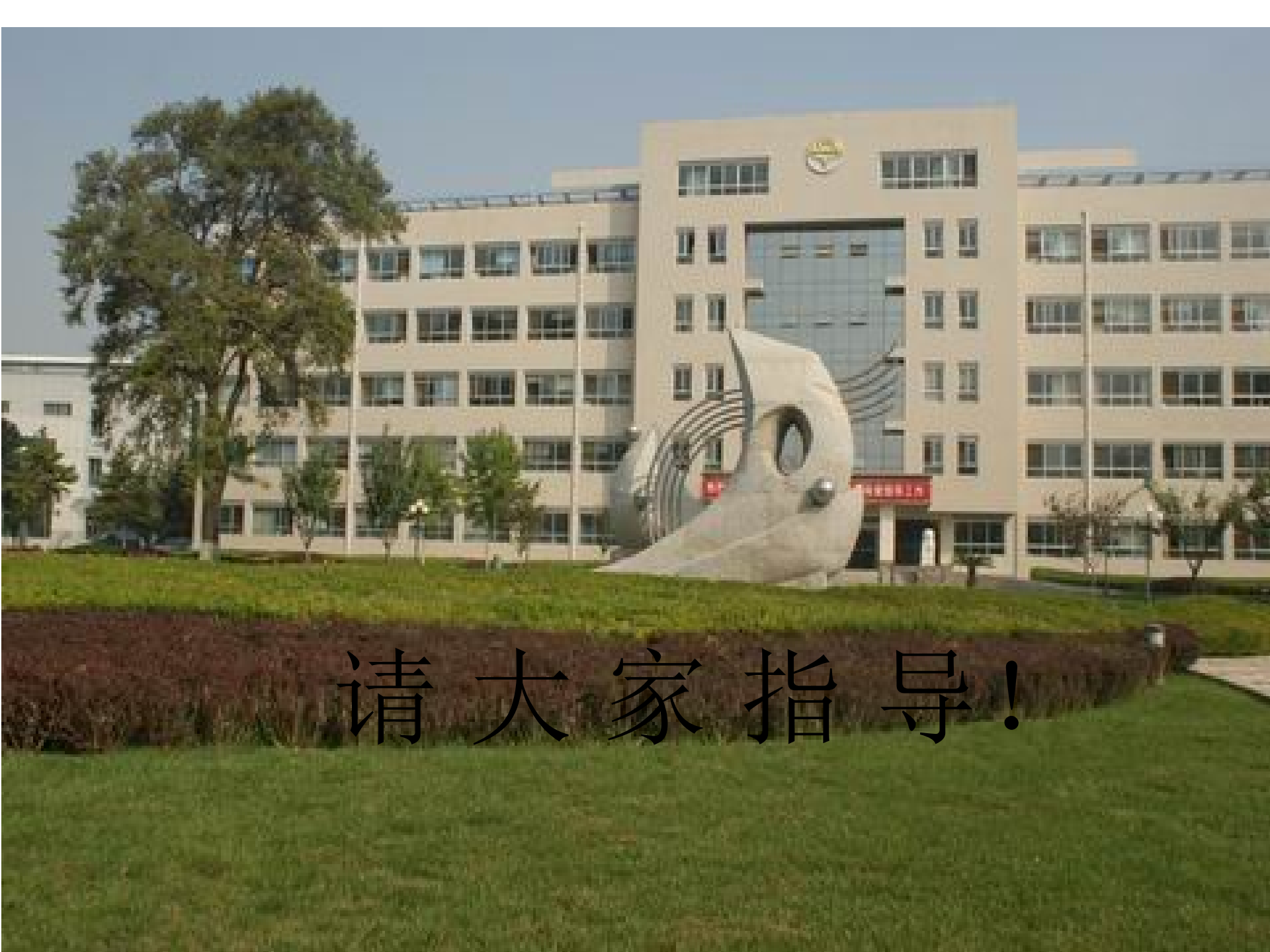
美丽的夜景



昵图网 [www.nipic.com](http://www.nipic.com) BY: YY2012fighting

NO:20111205164505873000

正宗的牛肉拉面



请大家指导!