# 生物信息学作业

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## homework_1

### Q1:What's the name of gene X in Mus musculus? Its accession number in GenBank database and coordinates of mouse genome

| TITLE | COLUMN |
|---|---|
| gene_name | NIMA-related expressed kinase 2 |
| accession_number | NM_010892.3 |
| chromosome | 1 H6; 1 96.94 cM |
| coordinates | 191552487..191565161 |

### Q2:The homolog of gene X in human, and its accession number

| TITLE | COLUMN |
|---|---|
| homolog in human | NEK2 |
| accession number | GenBank: BT019729 |

### Q3:In human, the protein product of this gene. Its functions, sub-cellular localizations. Whether it's an enzyme? If so, does it have a conserved functional domain?

| TITLE | COLUMN |
|---|---|
| protein product | NIMA-related kinase 2 [Homo sapiens] |

| TITLE | COLUMN |
|---|---|
| sub-cellular location | Isoform 1: Cytoplasm, Nucleus, nucleolus, centrosome, spindle pole, kinetochore, centromere<br>Isoform 2: Cytoplasm<br>Isoform 4: Nucleus, centrosome |
| function | Component, centrosome, condensed chromosome kinetochore, condensed nuclear chromosome, cytoplasm, cytosol, kinetochore, colocalizes_with kinetochore, microtubule, midbody, nucleolus, nucleoplasm, nucleus, protein-containing complex , spindle |

NIMA-related kinase 2 is an enzyme, which has a conserved functional domain STKc_Nek2 .

## Q4:Whether this gene is conserved in yeast? If so, identify its potential homolog.

It is conserved in yeast. Its potential homolog is kinase [Saccharomyces cerevisiae].

## Q5:The 3D structural information of gene X in human, but not mouse. It's accession number in PDB.

| TITLE | COLUMN |
|---|---|
| **Multimeric state** | monomeric |
| **Accessible surface area:** | 13200 $Å^2$ |
| **Buried surface area:** | 700 $Å^2$ |
| **Dissociation area:** | 350 $Å^2$ |
| **Dissociation energy ($\Delta G^{diss}$):** | -4 kcal/mol |
| **Dissociation entropy ($T\Delta S^{diss}$):** | 4 kcal/mol |
| **Interface energy ($\Delta G^{int}$):** | 1 kcal/mol |
| **Symmetry number:** | 1 |

accession number in PDBe: 2jav.

# homework_2

$P(\text{出}|\text{裤}) = \frac{P(\text{出})*P(\text{裤}|\text{出})}{P(\text{裤})}$

$P(\text{裤}) = \frac{P(\text{裤}|\text{未})*P(\text{未})}{P(\text{未}|\text{裤})}$

$P(\text{未}|\text{裤}) = 1 - P(\text{出}|\text{裤})$

则$P(\text{出}|\text{裤}) = \frac{5}{17} = 0.29$