

User guide with an example

The following instructions guide users in efficiently navigating and using VaxiGen for their research needs.

- **Home Page:** The Home page introduces the server. The top navigation bar provides access to the following functionalities:
 - **Home:** Returns the user to the Home page.
 - **Data:** The dropdown menu provides access to the Tumor and Viral Databases, containing the datasets used to develop the tumor and viral models. These datasets are available for downloading, searching, and analysis. From this menu, users can also download the datasets used for bacterial models.
 - **Help:** Directs users to the Help page, which provides instructions for using the server's functionalities.
 - **Log In / Register:** These links are displayed when the user is not logged in (Figure 2). "Log In" allows access to an existing account, while "Register" enables the creation of a new account using a username, email address, and password. Once logged in, these links are replaced with "Hello, {username}" and "Log Out," respectively.
- **Bottom Navigation Bar:** Provides additional links:
 - **Drug Design and Bioinformatics Lab:** Redirects to the website of the VaxiGen authors.
 - **VaxiJen v2.0:** Redirects to the previous version of the VaxiJen server.
 - **Cite:** Provides references for articles that users may cite if they find VaxiGen useful.
 - **Contact Us:** Allows users to contact the VaxiGen authors via email.

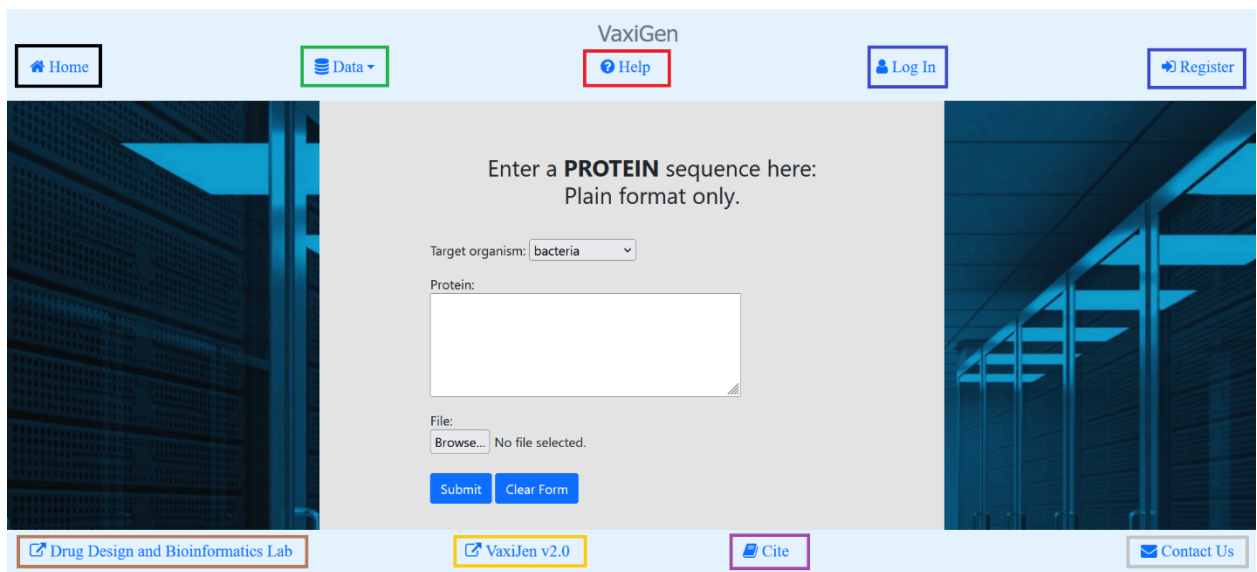


Figure 2. VaxiGen Home page.

- **Immunogenicity Assessment:** The primary function of VaxiGen – protein immunogenicity prediction – is accessible from the Home page. Users must be logged in to their account to use this feature. From the main submission form (Figure 3):
 - **Step 1:** Select the target organism (bacteria, virus, or tumor).
 - **Step 2:** Choose whether to assess a single protein or peptide (entered as plain text) or to upload a file containing multiple proteins or peptides in FASTA format, then submit the form.
- **Prediction Probability:** The probability assigned to a protein during immunogenicity assessment reflects the number of models that classify it as immunogenic or non-immunogenic. For each target organism, three models are used, yielding the following possibilities (Figure 4):
 - **None of the models classify the protein as immunogenic:** Probable non-immunogen, probability 100%.

- **One model classifies the protein as immunogenic:** Probable non-immunogen, probability 67%.
- **Two models classify the protein as immunogenic:** Probable immunogen, probability 67%.
- **All three models classify the protein as immunogenic:** Probable immunogen, probability 100%.

Enter a **PROTEIN** sequence here:
Plain format only.

Target organism:

Protein:

MCRMSFKKETPLANAAFWAARRGNLALLKLLNSGR
VDVDCRDSHGTTLLMVAAYAGHID
CVRELVQGADINLQRESGTTALFFAAQQGHNDVVRF
LFGFGASTEFRTKDGGTALLAAS
QYGHMQVVETLLKHGANIHDQLYDGATALFLAAQGG

File:

No file selected.

Figure 3. Main form of the server (example with protein input).

Results for protein MCRMSFKKETPLANAAFWAARRGNLALLKLLNSGRVDVDCRDSH
GTTLLMVAAYAGHIDCVRELVLQGADINLQRESGTTALFFAAQQGHNDVVRFLFGFGASTEF
RTKDGGTALLAASQYGHMQVVETLLKHGANIHDQLYDGATALFLAAQGGYLDVIRLLLASG
AKVNQPRQDGTAPLWIASQMGHSEVVRVMLLRGADRDAARNDGTTALLKAANKGYNDV
IKELLKFSPTLGILKNGTSALHAAVLSGNIKTVALLLEAGADPSLRNKANELPAELTKNERILRL
RSKEGPRKS:

Probable NON-IMMUNOGEN with a probability of 100%.

Figure 4. Results of protein immunogenicity assessment.