DEFENSINS Knowledgebase

A collaboration between Bioinformatics Institute and the Singapore Eye Research Institute

Introduction and motivation

Antimicrobial peptides present the first line of defense in a range of organisms against invading pathogens. Defensins are cationic antimicrobial peptides that show broad-spectrum activity against a variety of microorganisms: bacteria, fungi and some enveloped viruses.

Studies demonstrate that defensin peptides non-specifically kill invading pathogens by physically disrupting their membranes. This property makes them potential therapeutics that could be used to overcome the problem of resistance posed from use of conventional antibiotics.

In addition to the large natural diversity of defensins, an equally large number of synthetic analogs are being synthesized and studied.

The rapid surge in the number of defensin related publications [Fig. 1] being generated from both academia and industry alike prompted us to work on a central repository where we could collate, systematically organize and facilitate retrieval of defensin related information.
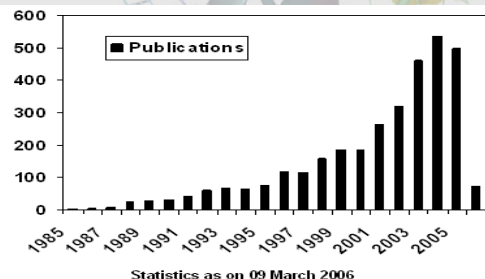

Figure 1 shows the number of publications devoted to defensins over the past 20 years
Data correct as on 09 March 2006

A curated database and information source devoted to the defensins family of antimicrobial peptides

Features of the Knowledgebase

DATABASE

- **Over 300 defensin records** have been entered till date.
- A **comprehensive query interface** is in place to search the database. This interface allows the user to **restrict and sort results** by: family, organism, expression sites, sequence length, antimicrobial targets [bacteria, fungi and viruses] and more.
- Each individual defensin record provides a brief description of the peptide, annotation, sequence and structure information
- Antimicrobial activity, cytotoxicity, mutational data and biophysical studies are captured where available.

WEBSITE

- The user can appreciate a range of other aspects on defensins from the website.
- These include information on Patents, Grants, Clinical Studies, Labs working on defensins, Literature and more.

Future Developments

- We envisage making the database more functional by adding analysis tools: Multiple Sequence Alignment and BLAST
- Addition of a structure viewing tool is also planned
- The knowledgebase will be fully documented with a user guide and more detailed write-ups will be added in the near future.
- A glossary will be linked to the database to define jargon terms
- Both database and the website will be kept constantly updated with new information

Defensins Knowledgebase

Defensins Knowledgebase is available at:

Web site: http://defensins.bii.astar.edu.sg/

E-mail: defensins@bii.a-star.edu.sg