Identification of novel antimicrobial peptides from the skin of *Leptodactylus macrosternum* (Anura Leptodactylidae) frog in northern Argentina

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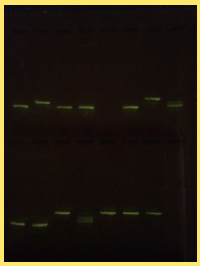
EXPLORATION OF BIODIVERSITY

RNA extraction

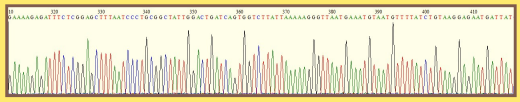
AMPs IDENTIFICATION

Molecular Cloning of cDNAs Encoding the Precursor Peptides

Inserts Purification and Amplification



Sequencing



Pre-pro-peptides

Signal Peptide	Acid Region	Mature Peptide

PEPTIDES CHARACTERIZATION

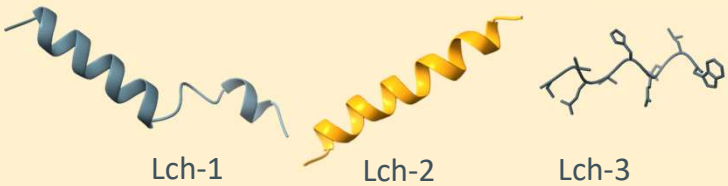
PREPRO-PEPTIDES

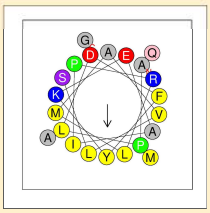
MAFLKKSLFLVLFLGLVSLSIC	DEEKRQDEEDDEDEDDDDEEKR	GLSDFYKGPSKEAIAQIMAKISQMNG
MAFLKKSLFLVLFLGLVSLSIC	DEEKRQDEEDDEDEDDDDEEKR	APLDFYKEAIPRLMAVLSQMAG
MAFLKKSLFLVLFLGLVSLSIC	DEEKREEEDEHDDEDEEEEEDVDHDVRK	SVETHQLLW

PHYSICOCHEMICAL PROPERTIES

Name	Mature Peptide Sequence	Lenght	Hydrophobic ratio (%)	Total net charge
Lch-1	GLSDFYKGPSKEAIAQIMAKISQMN-NH2	25	38	2
Lch-2	APLDFYKEAIPRLMAVLSQMA-NH2	21	55	0
Lch-3	SVETHQLLW	9	44	-1

3D THEORETICAL STRUCTURES





BIOACTIVITY PREDICTION

University of Nebraska Medical Center
APD3 ANTIMICROBIAL PEPTIDE DATABASE

Lch-1 and Lch-2
May interact with membranes and has chance to be AMPs

DBAASP Database of Antimicrobial Activity and Structure of Peptides

Lch-1 and Lch-2
General antibacterial activity

Lch-1, -2 and -3
May present antiviral activity. Not hemolytic.

DRAMP

Lch-1
Antimicrobial and non-hemolytic with SVM algorithm

CAMPR3 Collection of Anti-Microbial Peptides

Lch-1
Antimicrobial with several algorithms

OUTCOMES

- All four consulted databases predict Lch-1 as an antimicrobial peptide (AMP).
- The manual synthesis and subsequent testing of this peptide against various pathogenic strains are underway.
- These results emphasize the pivotal role of bioprospecting in unveiling distinct and unique bioactive compounds within each species.
- Furthermore, they highlight the crucial contribution of artificial intelligence in guiding this exploration.