NAME: Li, Xiao-Ping

eRA COMMONS USER NAME (agency login): XIAOPINGLI

POSITION TITLE: Associate Research Scientist

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Anhui Agricultural University, Hefei, Anhui	BAGR	02/1982	Tea and Food Science
Shenyang Agricultural University, Shengyang, Liaoning	MAGR	07/1988	Plant Physiology and Biochemistry
National University of Singapore, Singapore	PHD	04/1999	Biological Science
University of California, Berkeley, Berkeley, California	Postdoctoral Fellow	08/2004	Plant Molecular Biology and Genetics

A. Positions

Positions and Employment

1988 - 1993 Assistant Researcher, South China Institute of Botany, Chinese Academy of Science, Guangzhou

1993 - 1995 Associate Researcher, South China Institute of Botany, China Academy of Science, Guangzhou

2005 - 2012 Research Assistant Professor, Rutgers, The State University of New Jersey, New Brunswick, NJ

2012 - Associate Research Scientist, Rutgers, The State University of New Jersey, New Brunswick, NJ

Other Experience and Professional Memberships

1982 - 1985 Tea Scientist, Anhui Tea company

B. Contribution to Science

1. Identified the ribosomal stalk as the key element for the interaction of ricin A chain (RTA) with the ribosome, for depurination activity and cytotoxicity. A two-step RTA-ribosome interaction model was proposed. This model was confirmed by studying the interaction of RTA with purified ribosomal stalk complexes. According to this model RTA interacts with stalk proteins with the opposite face of active site. The interaction with the ribosomal stalk stimulates RTA activity by delivering RTA to the SRL in a proper orientation. I also showed that ribosomal stalk containing multiple copies of P-protein dimers interacts more efficiently with RTA than ribosomal stalk containing only one P-protein dimer.

    a. Li XP, Chiou JC, Remacha M, Ballesta JP, Tumer NE. A two-step binding model proposed for the electrostatic interactions of ricin a chain with ribosomes. Biochemistry. 2009 May 12; 48(18):3853-63.
    b. Li XP, Grela P, Krokowski D, Tchórzewski M, Tumer NE. Pentameric organization of the ribosomal stalk accelerates recruitment of ricin a chain to the ribosome for depurination. J Biol Chem. 2010 Dec 31; 285(53):41463-71
    c. May KL, Li XP, Martínez-Azorín F, Ballesta JP, Grela P, Tchórzewski M, Tumer NE. The P1/P2 proteins of the human ribosomal stalk are required for ribosome binding and depurination by ricin in human cells. FEBS J. 2012 Oct; 279(20):3925-36.
    d. Li XP, Kahn PC, Kahn JN, Grela P, Tumer NE. Arginine residues on the opposite side of the active site stimulate the catalysis of ribosome depurination by ricin A chain by interacting with the P-protein stalk. J Biol Chem. 2013 Oct 18; 288(42):30270-84.
    e. Grela P, Li XP, Tchórzewski M, Tumer NE. Functional divergence between the two P1-P2 stalk dimers on the ribosome in their interaction with ricin A chain. Biochem J. 2014 May 15;460(1):59-67
    f. Basu D, Li XP, Kahn JN, May KL, Kahn PC, Tumer NE. The A1 Subunit of Shiga Toxin 2 Has Higher Affinity for Ribosomes and Higher Catalytic Activity than the A1 Subunit of Shiga Toxin 1. Infect Immun. 2015 Oct 19;84(1):149-61.
    g. Jetzt AE, Li XP, Tumer NE, Cohick WS. Toxicity of ricin A chain is reduced in mammalian cells by inhibiting its interaction with the ribosome. Toxicol Appl Pharmacol. 2016 Nov 1;310:120-128.
    h. Zhou Y, Li XP, Chen BY, Tumer NE. Ricin uses arginine 235 as an anchor residue to bind to P-proteins of the ribosomal stalk. Sci Rep. 2017 Feb 23; 7:42912.
    i. Li XP, Tumer NE. Differences in Ribosome Binding and Sarcin/Ricin Loop Depurination by Shiga and Ricin Holotoxins. Toxins (Basel). 2017 Apr 11;9(4). pii: E133

2. Using molecular and genetic approaches I demonstrated that the PsbS protein of photosystem II is an essential element in the regulation of light-harvesting. I further demonstrated with genetic, molecular and biophysical evidence that the psbS gene dosage determines the PsbS protein level and consequently the capacity for energy dissipation (qE). We generated Arabidopsis lines with extra psbS gene copies to synthesize more PsbS protein and achieve higher qE capacities. Using these higher qE lines along with double and triple mutants of different xanthophyll biosynthesis genes I showed that qE is important for photoprotection of photosystem II under short-term high light stress. Further using PCR-based site-directed mutant techniques, I showed that two key glutamate amino acid residues in lumen exposed regions of the PsbS are responsible for sensing of the chloroplast thylakoid lumen pH in the qE mechanism. With femtosecond transient absorption

experiments we showed the first direct evidence that zeaxanthin accepts singlet excited state energy from chlorophyll a as a fundamental process in PSII thermal energy dissipation.

a. Li XP, Björkman O, Shih C, Grossman AR, Rosenquist M, Jansson S, Niyogi KK. A pigment-binding protein essential for regulation of photosynthetic light harvesting. Nature. 2000 Jan 27; 403(6768):391-5. PubMed PMID: 10667783.
b. Li XP, Gilmore IS, Niyogi KK. Molecular and global time-resolved analysis of a psbS gene dosage effect on pH- and xanthophyll cycle-dependent nonphotochemical quenching in photosystem II. J Biol Chem. 2002 Sep 13; 277(37):33590-7. PubMed PMID: 12110676.
c. Li X, Phippard A, Pasari J, Niyogi K. Structure–function analysis of photosystem II subunit S (PsbS) in vivo. Functional plant biology: FPB. 2002 October 18; 29(10):1131-1139.
d. Li XP, Muller-Moule P, Gilmore AM, Niyogi KK. PsbS-dependent enhancement of feedback de-excitation protects photosystem II from photoinhibition. Proc Natl Acad Sci U S A. 2002 Nov 12; 99(23):15222-7. PubMed PMID: 12417767; PubMed Central PMCID: PMC137571.

3. I demonstrated that free radical induced lipid peroxidation plays a major role in leaf senescence. I cloned three superoxide dismutases genes (Mn-SOD, and chloroplast Zn-SOD and Fe-SOD) from gametophyte of Acrostichum aureum (a Mangrove fern). I documented that oxygen free radicals are induced under salt stress and different SOD genes respond differently to the stress in gametophyte of Acrostichum aureum.

a. Li XP, Hu WY. The effect of light and hormones on leaf senescence. Acta Botanica Sinica. 1990; 32:957-965.
b. Li XP, Ong BL. Tolerance of gametophytes of Acrostichum aureum (L.) to salinity and water stress. Photosynthetica. 1997; 34:21-30.
c. Li XP, Ong BL. Responses of photosynthesis to NaCl in gametophytes of Acrostichum aureum. Physiologia plantarum. 1998; 102:119-127.

Complete List of Published Work in My Bibliography:

https://www.ncbi.nlm.nih.gov/myncbi/collections/bibliography/48205960/

C. Research Support

Ongoing Research Support

2R01AI072425-10A1

Tumer, Nilgun E (PI)

02/01/17-01/31/22

NIH/NIAID

Inhibitors targeting ribosome interactions of ricin

The major goal of this project is to use fragment based ligand discovery to identify inhibitors against the catalytic activity and toxicity of ricin.

Role: Co-investigator

Completed Research Support

R01AI072425-06A1, NIH/NIAID
Tumer, Nilgun E (PI)
08/20/12-07/31/16

What makes ricin toxic?

The major goal of this project is to identify ribosome binding site of ricin and cellular targets of ricin in mammalian cells
Role: Co-investigator

1R21AI092011-01A1, NIH/NIAID
Tumer, Nilgun E (PI)
03/01/12-02/28/14

Role of the ribosomal stalk in the activity of Shiga toxins

Determine if differences in the interaction of Shiga toxins 1 and 2 with ribosomal stalk are critical for their depurination activity and cytotoxicity
Role: Co-investigator

R03TW008418, NIH
Tumer, Nilgun E (PI)
01/21/10-12/31/13

Interaction of ricin A chain with the ribosomal stalk

Investigate the interaction of RTA with the yeast stalk mutants
Role: KP

U01AI082120, NIH
Pang, YP (PI)
04/06/09-03/31/13

Optimization of small molecule inhibitors of Shiga and ricin toxins

Develop small molecule inhibitors against ricin and Shiga toxin
Role: KP