

## **Peng Cao, Ph.D.,**

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### **Education :**

#### **B.S. (Sep 1997-June 2001)**

Life Sciences College, Nanjing Normal University  
Major: Biology.

#### **Ph.D. (Sep 2001- June 2006)**

Key Laboratory for Molecular and Medical Biotechnology, Life Sciences College,  
Nanjing Normal University  
Major: Molecular and Cell Biology.  
Mentor: Dr. Shuangquan Zhang

### **Research Area:**

Common variable immunodeficiency (CVID) is a group of immunodeficiency syndromes in which B cell immunity is abnormal. BAFF protein has been found to increase the antibody levels in patients with CVID, as well as other immunodeficiency conditions with mimic CVID. I established a high yield expression system and developed an efficient refolding technique, which effectively produces a large scale of therapeutic BAFF recombinant protein. Meanwhile, it has also been demonstrated that overproduction of BAFF in human is involved in the pathogenesis of B cell-mediated autoimmune diseases such as systemic lupus erythematosus (SLE), rheumatoid arthritis (RA), and Sjögern's syndrome (SS). I obtained anti-BAFF single-chain antibody fragment (scFv) by use of human phage display library and successfully obtained ten scFv neutralizing BAFF sequences. In order to find out potential molecules for the therapy of autoimmune disorders, I developed scFv-Fc fusion expression constructs and established stable expressing eukaryocyte system (CHO cells). The novel fully human antibody NjAb can inhibit the activities of BAFF *in vitro* and *in vivo*. My work had rased tremendous interests in this area and currently in collaboration with pharmaceutical company.

### **Publications:**

1. **Peng Cao**, Zhinan Xia, Wei Song, Shuangquan Zhang, Neutralizing human anti-B-cell-activating factor of the TNF family (BAFF) scFv selected from phage antibody library. *Immunology letters*, 2005 (101), 87-94.
2. **Peng Cao**, Jingjing Mei, Zhenyu Diao, Shuangquan Zhang, Expression, refolding, and characterization of human soluble BAFF synthesized in *Escherichia coli*, *Protein Expression and Purification*, 2005, 41(1):199-206.
3. **Peng Cao**, Xianming Tang, Zhenbin Guan, Zhenyu Diao, Shuangquan Zhang, Production and characterization of a bacterial single-chain antibody fragment (scFv)

specific to B-cell-activating factor of the TNF family (BAFF). *Protein Expression and Purification*. 2005, 43 (2):157-164.

4. **Peng Cao**, Shuangquan Zhang, Construction and characterization of a bi-functional GFP/sBAFF fusion protein. *Biochimie*, (2005, In press).
5. **Peng Cao**, Shuangquan Zhang, Zhunan Gong, Yunlong Hu, Development of a compact anti-BAFF antibody in *Escherichia coli*. *Applied Microbiology and Biotechnology*, (2006, in press).
6. **Peng Cao**, Meng Cao, Shuangquan Zhang, Generation and characterization of a novel fully human antibody NjAb that antagonizes the bioactivities of B-cell-activating factor of the TNF family (BAFF) in vitro and in vivo. (In preparation).
7. **Peng Cao**, Progress on B-cell-activating factor of the TNF family (BAFF), Section of Immunology, *Foreign Medical Sciences*, 2003, 26 (6): 301-304. (Review)
8. Yurong WU, **Peng Cao**, Shuangquan Zhang, Study on the heredity stability of a recombinant plasmid pET30a /hsBLyS in *E. coli* BL21(DE3), *Journal of Xinyang Normal University (Natural Science Edition)*, 2005,18(2): 165-168. (Chinese)
9. Zhenbin Guan, **Peng Cao**, Shuangquan Zhang, cloning, expression and activity analysis of human soluble BCMA in *Escherichia coli*, *Chinese Journal of Biotechnology*, 2006, 1: 46-51. (Chinese)

#### **Patents:**

Shuangquan Zhang, **Peng Cao**

Establishment of purification procedure of recombinant B-cell-activating factor of the TNF family (BAFF). 2004, patent number: 200410065816.9.

Shuangquan Zhang, **Peng Cao**

The sequence of heavy and light chain variable region genes of monoclonal antibody specific B-cell-activating factor of the TNF family (BAFF) and its application. 2005, patent number: 200510037671.6.

#### **Grants and Fellowship:**

Jiangsu Province Graduate Student Innovation Project Grant (2005-2006), "Development of a novel fully human antibody against human B lymphocyte stimulator".

#### **Skills:**

Molecular biology	DNA and RNA manipulations, subcloning, minipreps, maxipreps, RT-PCR, Overlap PCR, site-directed mutagenesis, deletional analysis, library construction, library screening (human antibody phage display library)
Protein Chemistry (Protein purification)	SUMO fusion expression biotechnology, Ion-Exchange chromatography, Gel-Filtration Chromatography, Hydrophobic-Interaction, Chromatography, Affinity Chromatography, ELISA, Western blotting, FACS
Cell Culture	Transient transfections, Stable transfections, Protein expression (eukaryocyte, bacterial, and pichia).

**Honors and Awards:**

Principal special scholarship, Nanjing Normal University,	Dec, 2005
Outstanding graduate student, Nanjing Normal University,	Nov, 2005
Zhu Jinwen scholarship, Nanjing Normal University,	Mar, 2005

**Other activities and Honors:**

Fresh undergraduate student Calligraphy game, Champion, Nanjing Normal University, Sep, 1997.

**Referees:****Shuangquan Zhang, Ph.D.,**

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