

XUEZHEN KANG

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OBJECTIVE

- To find a challenging research and development position which would profit from my technical skills as a biochemical engineer. Specifically desire to apply engineering principles to fermentation and bioseparation processes, utilize and increase knowledge of cGMPs, and facilitate bioprocess development.

EDUCATION

- **Ph.D. in Chemical Engineering**, Expected: 08/02, GPA 3.6/4.0
University of Maryland, Baltimore County (UMBC), Baltimore, Maryland
- **M.S. in Biochemical Engineering**, 07/98, GPA 86/100
Chinese Academy of Sciences (CAS), Beijing, China
- **B.S. in Microbiology**, 07/95, GPA 90/100
Shandong University, Jinan, China
- **Biotechnology Regulatory Program Certificate**, UMBC
Regulatory Issues in Biotechnology (Fall, 1999)
Good Manufacturing Practices for Bioprocesses (Spring, 2000)
Quality Control/Quality Assurance of Biotechnology Products (Fall, 2000)
Biotechnology GMP Facility Design, Construction and Validation (Spring, 2001)
- **Computer Science Minor Certificate**, 07/95, Shandong University

TECHNICAL SKILLS

- **Cell Culture and Fermentation:** Plant cell culture, bacterial and fungal fermentation using standard stirred tank reactor (STR), air-lift bioreactors and other novel bioreactors.
- **Separation and Purification Using HPLC and FPLC:** SEC, IEC, RPC, HCIC, chromatofocusing, and affinity chromatography.
- **Analytical Techniques:** IEF, SDS PAGE, native PAGE, 2D-PAGE, Western blot, and ELISA.
- **Computer Skills:** C, Pascal, Sybase, VB, HTML, and ASP.
- **Other Skills:** Packing HPLC and FPLC columns, bioreactor design, and bioprocess scale-up.

PROFESSIONAL EXPERIENCE

Analytical- and Preparative-Scale Protein Purification using Novel Chromatofocusing Methods
PhD thesis, 08/98 to present

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- Fast (2 minutes or less) high-resolution separation of proteins at both analytical- and preparative-scales using simple buffer mixtures.
- Developed computer software to design a pH gradient of a desired shape.
- Developed novel methods such as cation-exchange chromatofocusing and hydrophobic charge induction chromatofocusing to extend the range of application of chromatofocusing.

Characterization of Novel Chromatographic Column Packings

Collaborative project with Grace Vydac, 08/00 to present

- Investigated a novel silica-based column packing to be used in affinity chromatography of monoclonal antibodies.
- Characterized novel types of column packings, optimized the particle size, pore size, protein A loading, and prepared the technical parameters used for marketing.

Production of Scleroglucan by *Sclerotium glaucanicum* in an Air-Lift Bioreactor with an Internal Loop

Master's thesis, 07/96 to 07/98

- Designed and successfully used a novel air-lift bioreactor with an internal loop (ALR-IL) in the production of scleroglucan, a type of polysaccharide with high anti-tumor activity.
- Studied effect of airflow rate on the synthesis of scleroglucan.
- Investigated the mixing behavior and hydrodynamic characteristics of the highly viscous fungal broth in ALR-IL.
- Based on these understandings, the operation conditions were optimized to reach a high level of polysaccharide productivity compared to that in STR.

Artemisinin Production by Hairy Roots and Adventitious Shoots of *Artemisia annua* L. in a Novel Mist Bioreactor

Additional work done at CAS, 09/95 to 07/96

- Cultured hairy roots and adventitious shoots of *Artemisia annua* L. in a novel mist bioreactor specifically designed for plant cell culture.
- Investigated effect of light, temperature and cultivation modes on growth and artemisinin synthesis.

Optimization of 2-Keto-L-Gulonic Acid (2KGA) Fermentation Process in the Mixture Culture of Vitamin C Two-Step Fermentation

Bachelor's thesis done at Tsinghua University, Beijing, China, 02/91 to 07/91

- Clarified the previously unknown relationship between the two kinds of bacteria, *Bacillus megaterium* and *Gluconobacter oxydans*, in the mixture culture system for 2KGA fermentation.
- Tested the influence of *B. megaterium* on the population growth of *G. oxydans* and 2KGA production at different ratios of initial inoculation densities.

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PUBLICATIONS

1. **X. Kang** and D. D. Frey "High Performance Chromatofocusing Using Linear and Convex pH Gradients Formed with Polybuffer and Simple Buffer Mixtures Using Cation-Exchangers" (in preparation).
2. **X. Kang**, Y. Wang, and B. McNeil "Hydrodynamic Characteristics and Mixing Behavior of the Scleroglucan Fermentation System in an Airlift Reactor with an Internal Loop" (in preparation).
3. H. Wang, **X. Kang**, Y. Wang and B. McNeil "Kinetic Models of Scleroglucan Fermentation in a Standard Stirred Tank and Air-Lift Bioreactors" (in preparation).
4. **X. Kang** and D. D. Frey "Chromatofocusing Using Micropellicular Column Packings with Computer-Aided Design of the Elution Buffer Composition" (*Analytical Chemistry*, in press).
5. R. Bates, **X. Kang**, and D. D. Frey "High Performance Chromatofocusing Using Linear and Concave pH Gradients Formed with Simple Buffer Mixtures I. Effect of Buffer Composition on the Gradient Shape," *J. Chromatogr. A*, 890, 25-36, 2000.
6. **X. Kang**, R. Bates, and D. D. Frey "High Performance Chromatofocusing Using Linear and Concave pH Gradients Formed with Simple Buffer Mixtures II. Separation of Proteins," *J. Chromatogr. A*, 890, 37-43, 2000.
7. **X. Kang**, Y. Wang, L. M. Harvey and B. McNeil "Effect of Air Flow Rate on Scleroglucan Synthesis by *Sclerotium glaucum* in an Airlift Bioreactor with an Internal Loop," *Bioprocess Engineering*, 23(1), 69-74, 2000.
8. C. Liu, Y. Wang, **X. Kang**, F. Ouyang, C. Ye, and F. Li "Investigation of Light, Temperature and Cultivated Modes on Growth and Artemisinin Synthesis of *Artemisia annua* L. Shoots," *Acta-Phytophysiologica-Sinica*, 25(2), 105-109, 1999.
9. C. Liu, Y. Wang, **X. Kang**, F. Ouyang, C. Ye, and F. Li "Artemisinin Production by Adventitious Shoots of *Artemisia annua* in a Novel Mist Bioreactor," *Acta-Botanica-Sinica*, 41(5), 524-527, 1999.