



## WATER RESOURCES RESEARCH GRANT PROPOSAL

**Project ID:** 2004OR47B

**Title:** Synergetic effects of colloids and organic matter on membrane fouling

**Project Type:** Research

**Focus Categories:** Water Use, Treatment, Water Quality

**Keywords:** Nanofiltration, membranes, colloid particles, dissolved organic matter

**Start Date:** 02/15/2004

**End Date:** 02/14/2005

**Federal Funds:** \$9,837

**Non-Federal Matching Funds:** \$20,194

**Congressional Districts:** Oregon 1 and 5

**Principal Investigator:**

Qilin Li

### **Abstract**

The objectives of this project are: (1) to determine the synergetic effect of combined fouling of nanofiltration membranes by colloidal material and dissolved organic matter in drinking water purification and wastewater reclamation; (2) to reveal the mechanisms of combined fouling, and (3) to develop efficient chemical cleaning strategies for membrane flux recovery. The general approach for the proposed research is to determine the roles of colloidal material and dissolved organic matter in combined fouling of NF membranes under various solution chemistries, and to test the efficiency of different chemical cleaning strategies for membranes fouled by feed water with different colloid/organic compositions. Both bench scale filtration/chemical cleaning experiments and microscopic analysis of the combined colloid/organic fouling layer will be conducted to relate the structure and stability of the fouling layer to the membrane flux decline rate and the chemical cleaning efficiency. The effect of colloidal particle size and solution chemistry on combined membrane fouling and chemical cleaning will be investigated.