Topical Workshops (2002-2005)

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Biomimetics-III

Nature of Protein/Inorganic Interfaces

August 27-30, 2002 (2.5 days)

Friday Harbor Marine Laboratory, San Juan Island, WA

Organizer: **Mehmet Sarikaya Univ. of Washington**
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The **Purpose** of the workshop is to explore ways to understand the nature of protein binding onto inorganic surfaces, including experimental and theoretical approaches, by bringing together experts in biochemistry, genetics, biotechnology, biophysics, chemistry, materials sciences and engineering.

Background: As one of the building blocks of all living systems, proteins play enormous variety of roles: some transport and store small molecules, others make up large part of the structural framework of cells and tissues, and still others carry out enzymatic reactions. Recently, proteins, big and small, have been used in non-traditional sciences and technologies including nanobiotechnology, drug-delivery, tissue engineering and molecular biomimetics. Designer proteins, off-the-shelf molecules, proteins selected via combinatorial mutagenesis, and those extracted from hard tissues are used for tissue regeneration, bone and dental biomineralization, as linkers for nanoparticles and polymers (molecularly hybrid systems), and as structural and functional biopolymers integrated into nanosystems.

The **format** of the workshop will follow that of Gordon Conferences (i.e., morning sessions, free afternoons, posters, dinner and evening talks) with plenty of free time for discussions. Friday Harbor Marine Laboratory is located on beautiful San Juan Island, at the NW coast of WA state, near Canada. There would be plenty of outdoor activities include kayaking, bird and whale watching, fishing, bicycling, boating, and many more..

The **registration** is on-line at the web-site:
https://www.engr.washington.edu/~uw-epp/wpi/regform.html
Further information about the workshop is at:
http://depts.washington.edu/bionano/PHP/workshops.php

Tentative Schedule:

August 27 – Arrival at FHL, Registration & Dinner

Aug. 28, Wednesday:

8:30 a.m. *Opening Remarks – Proteins in biology and materials science*
Mehmet Sarikaya, MSE, University of Washington, Seattle

9:00 a.m. *Amelogenins – Role in enamel structure and function –*
Malcolm Snead, Craniofacial Molecular Genetics, USC, LA

9:40 a.m. *Organic/Inorganic interaction in the vertebrate skeleton –*
– William Landis, Biochemistry and Molecular Pathology,
NE Ohio Univ. College of Medicine, Rootstown, OH

10-20 – 10:45 Coffee Break

10:45 a.m. *Protein engineering for inorganic surfaces – Combinatorial biology approaches*
Beth Traxler & Francois Baneyx, Microbiol. & Chem. Eng., Univ. of Washington, Seattle

11:25 a.m. *Protein functionalized SAMs as biosensors*
Charlie Campbell, Chemistry, Univ. of Washington, Seattle

12:00-1:00 p.m. Lunch

1:00 – 4:00 p.m. Free Time

4:00 – 6:00 p.m. Poster Session

6:30 – 7:30 p.m. Dinner

7:30 p.m. *Bacterial surface-layer proteins – From biology to*
– *technology*
John Smit, Microbiology, U. of British Columbia, Canada

8:15 p.m. Thermophile Bacteria – Life at the Edge
Jonathan Trent, NASA Ames, Moffett Field, CA

9:00 p.m. *Single-Photon Detection – How does rhodopsin do it*?
Kris Palczewski, Ophthalmology, U. Washington, Seattle

- **Aug. 29, Thursday:**

- 8:30 a.m. *Protein interactions with controlled surfaces*
  – Shaoyi Jiang, Chemical Engineering, U. Washington, Seattle
- 9:15 a.m. *Peptide helix induction on a self-assembling nanocluster*
  – David Wright, Chemistry, Vanderbilt Univ., Nashville, TN
- 10:00 – 10:30 Coffee Break
- 10:30 a.m. *Biological interface with inorganics: The best of both worlds*
  – Morley Stone, AFR Labs, Wright-Patterson AFB, Dayton, OH
- 11:15a.m. *Silicatein – A biological enzyme for silicate synthesis*
  – Jan Sumerel & Dan Morse, Molecular Biology, UCSB, Santa Barbara

- 12:00-1:00 p.m Lunch

- 1:00 – 4:00 p.m. Free Time
- **4:00 – 6:00 p.m. Poster Session**
- 6:30 – 8:30 p.m. B-B-Q Dinner

- 8:30 p.m. *Scanning probes as tools for nano- and bio-technology*
  Calvin F. Quate, Physics, Stanford University

- **Aug. 30, Friday:**

- 8:30 a.m. *Mischief in the Abalone Shell: Polypeptide sequences which influence calcite nucleation*, Jim Evans, Chemistry, New York Univ., New York, NY
- 9:15 a.m. *Nature of the protein binding on hydroxyapatite – A solid-state NMR investigation*
  Wendy Shaw, Pacific Northwest National Laboratory, Richland, WA
- 10-00 – 10:15 Coffee Break
- 10:15 a.m. *Engineered polypeptide/inorganic interaction – A Molecular dynamics simulation*
  Rosemary Braun & Klaus Schulten, Univ. of Illinois, Urbana, IL
- 11:00 a.m. *Molecular design, single molecular imaging, and spectroscopy for molecular electronics*
  Alex Jen, MSE, Univ. of Washington, Seattle, WA
- 11:45-12:15 Closing Discussions, Remarks, & Future Topical Workshops

- 12:15-1:15 Lunch
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- **1:30 – 3:00 p.m. Departure from FHL**

Workshop Registration can be accomplished on-line at: http://www.washington.edu/~uw.epp/wpi/regform.html, by e-mail or requesting a fax-form (see contact information below)

Cost: The cost of the registration, accommodations, food, and transportation is $500/person (see on-line registration). Students and post-docs are $100 if they present a poster.

Location of the Workshop is at Friday Harbor Marine Laboratory (a University of Washington, Facility) on San Juan Island, WA (http://depts.washington.edu/fhl)

Hotel: FHL facilities will be used for accommodations and food. If you prefer otherwise, please contact nearby hotels at San Juan Island (http://www.sanjuanisland.org)

How to get from SeaTac airport to San Juan Island: The transportation from SeaTac to San Juan Island requires 2 hr drive and 1 hr 20 min ferry ride from Anacortes. Therefore, we will provide a van service for each of the attendees who is flying into Seattle-Tacoma International Airport. After the workshop, you will be transported back to the Airport with a van again. The workshop van service is also available from the UW Campus the day before the workshop and back.

Internet Access: -There will be direct access to the Internet from the workshop site and at the FHL library which is open 24 hrs/day.

What else to do at Friday Harbor? – Well, if you find time from wonderful workshop presentations, you could go to whale watching, fishing, bicycling, ocean viewing, strolling around the cute town of Friday Harbor or at the FHL facilities, visiting the Marine Library, or just relaxing.

What is needed from you before your arrival? All you need is to tell us (e-mail to Stacy below) your flight schedule (or UW Campus schedule) so that there would be a van readied to pick you up at the time of your arrival .

Contacts and Questions:
Stacy Williamson, Coordinator (stacyw@u.washington.edu) or Mehmet Sarikaya (sarikaya@u.washington.edu).