

# Payam Minoofar, Ph. D.

## Synopsis

Experienced scientist with

- Over 9 years of work experience in industries ranging from environmental chemistry and analytical chemistry to clinical diagnostics and proteomics in the clinical setting.
- Expertise in spectroscopy, materials chemistry, luminescent materials and analytical methods.
- Proven ability to work in multidisciplinary settings, in foreign countries and in foreign languages.

## Goal

Research and development position in an industrial setting, ideally in photovoltaics, materials chemistry, medical diagnostics, or any setting that requires the application of spectroscopy.

## Experience

**August 2006-present: APIC Corp. Los Angeles, California**

### Development of an Explosives Detector Based on Infrared Spectroscopy

- Designed and chemically characterized (with gas chromatography) three preconcentrators.
- Chemically characterized and integrated a commercial preconcentrator acquired from Sandia National Labs into our compact photoacoustic spectrometer which uses quantum cascade lasers.
- Numerically simulated the expected output with the profile of the quantum cascade lasers (QCL).
- Designed, developed and chemically characterized a vapor generator for high explosives.
- Chemically characterized the final QCL photoacoustic spectrophotometer.
- Developed computer algorithms for system control.
- Wrote and submitted proposals for government grants, interacted with government sponsor (DoD) and assured compliance with specifications of contract.

**April 2004-October 2007: John Wayne Cancer Institute. Santa Monica, California**

### Proteomic Analysis of Primary Hyperparathyroidism

- Microtomed, stained and performed laser capture microdissection (LCM) on human tissue.
- Processed and obtained the surface enhanced laser desorption ionization (SELDI, a modified MALDI method) mass spectra of captured cells.
- Analyzed results with classification and regression trees (CART).
- Leading the collaboration with Drs. Armando Giuliano (John Wayne Cancer Institute), Dave S. Hoon (John Wayne Cancer Institute) and Martin Eisenacher (Ruhr Universität Bochum, Germany).

**November 2004-December 2005: van't Hoff Institute for Molecular Sciences. Universiteit van Amsterdam, The Netherlands, and Wesfälische Wilhelms-Universität Münster, Germany.**

### Spectroscopy of Luminescent Materials and Devices

- Steady-state spectroscopy, transient absorption and fast (sub-picosecond) dynamics of luminescent materials (small organic molecules, cyclometalated Iridium complexes, supramolecular zinc assemblies, and conducting polymers) designed for higher efficiency electroluminescent devices.
- Fabrication and spectroscopic characterization of electroluminescent devices (sponsored by Philips Electronics).
- Quantum chemical (Gaussian 03) treatment of the electronic structures of cyclometalated iridium complexes.
- In collaboration with Professors Michael Schmittle (Uni-Siegen, Germany), Gianluca Farinola (Uni-Bari, Italy) and Drs. Igor Avilov and Jérôme Cornil (Université Mons-Hainaut, Belgium).

**September 1998-February 2004: Department of Chemistry and Biochemistry. UCLA.**

### Doped, Nanostructured Silicate Sol-Gel Thin Films and Bulk Sol-Gel Materials

- Synthesized nanostructured silicate sol-gel thin films containing europium complexes, laser dyes, and a water soluble polyparaphenylenevinylene.
- Designed, synthesized and characterized functional sol-gel thin films: thin films in which selective placement of luminescent dopants transported energy from one region to another region through resonance energy transfer (RET). Deduced information about the location of the dopants and their distribution in the films from quantitation of energy transfer according to the Förster model.
- Characterized luminescent, mesostructured silicate thin films with x-ray diffraction, luminescence, excitation and UV-Vis absorption spectroscopy with conventional and laser light sources, and time domain and frequency domain luminescence lifetime measurements.
- Performed two-photon photodeposition of gold nanoparticles in sol-gel matrices.
- Designed and constructed a humidity control chamber for improved film synthesis.
- Characterized luminescent vaults (eucaryotic ribonucleoprotein particles).
- Collaborations with Professors Bruce Dunn (UCLA Dept. of Materials Science) and Lenny Rome (UCLA School of Medicine).

**April 1996-September 1998: John Wayne Cancer Institute. Santa Monica, California**

**Etiology and Treatments of Disorders of Bone Metabolism**

- Carried out and completed the clinical analysis of a 50-center international study of the efficacy of salmon calcitonin therapy in the treatment of human osteoporosis for Sandoz Pharmaceuticals. Performed radioimmunoassays on patient serum specimens from the 50 centers, gathered and statistically analyzed data, and acted as a liaison between the research centers and the sponsor.
- Conducted a study of the relationship between declining testosterone levels in elderly men and prostate cancer patients and the increased incidence of osteoporosis in those populations.
- Developed a new test of parathyroid gland function.
- Acted as site coordinator for a clinical trial of a bisphosphonate patch in Paget's disease of bone patients for Novartis Pharmaceuticals.
- Contributed to the implementation of quantitative computed tomography at St. John's Hospital.

**1994-1995: McGaw, Inc. Irvine, California**

**Toxicology of Drugs and Pesticides**

- Performed liquid and solid phase extraction of radiolabeled drug and pesticide metabolites from plant and animal tissue.
- Developed methods, characterized and identified metabolites through HPLC and GC-MS in compliance with GLP guidelines as part of toxicology studies required by the FDA and EPA.
- Prepared reports.

**1989-1991: Department of Chemistry. University of California, Berkeley**

**Synthesis of Natural Product Analogs**

Performed the total synthesis of inositol triphosphate analogs via Diels-Alder reaction with activated dienes, radical chemistry on sugars, and synthesis from 1,4-cyclohexadiene.

## Other Experience

**January-February 2006: Wavemetrics, Inc. Portland, Oregon**

**An Introductory Programming Manual for Scientists**

Authored an introductory programming manual for the data processing software IGOR Pro.

**September 1998-June December 2001: Department of Chemistry, UCLA**

**Teaching Assistant**

- Prepared and delivered lectures, devised, proctored and graded exams and quizzes in general, organic, and advanced inorganic chemistry discussion sections of 10 to 30 students.
- Taught and organized courses in general and organic laboratory techniques.
- Instructed the use of HPLC, GC-MS, XRF, and AA spectrometry methods and the theory and application of statistical analysis in an advanced instrumental analysis laboratory course.
- Mentored three undergraduate students in independent research.

## Additional Skills

- Proficiency with all major productivity software packages; programming IGOR Pro for data analysis, visualization and presentation. Programming experience in other BASIC and Pascal.
- Fluent in Farsi, intermediate French and German, some proficiency in Hebrew.

## Education

**University of California, Los Angeles. Ph.D., Inorganic Chemistry. February 2004**

Dissertation Title: "Confinement of Luminophores in Mesostructured Sol-Gel Thin Films: Deliberate Placement of Lanthanides and Laser Dyes and Quantitation of Energy Transfer"

Jeffrey I. Zink, advisor.

**University of California, Berkeley. Bachelor of Science, Chemistry. May 1992**

## Publications

- Avilov, I.; **Minoofar, P.**; Cornil, J.; De Cola, L.; "Influence of substituents on the energy and nature of the lowest excited state of heteroleptic phosphorescent Ir(III) complexes: a joint theoretical and experimental study" *Journal of the American Chemical Society*, **2007**, 129(6), 8247-8258.
- Kickhoefer, V.; Garcia, Y.; Mikyas, Y.; Johansson, E.; Zhou, J.; Raval-Fernandes, S.; **Minoofar, P.**; Zink, J.; Dunn, B.; Stewart, P.; Rome, L.; "Engineering of vault nanocapsules with enzymatic and fluorescent properties" *Proceedings of the National Academy of Sciences* **2005**, 102(12), 4348-4352.

- **Minoofar, P.;** Dunn, B.; Zink, J.; "Multiply Doped Nanostructured Silicate Sol-Gel Thin Films: Spatial Segregation of Dopants, Energy Transfer, and Distance Measurements" *Journal of the American Chemical Society* **2005**, 127(8), 2656-2665.
- **Minoofar, P.;** Hernandez, R.; Franville, A.; Chia, S.; Dunn, B.; Zink, J.; "Strategies for spatially separating molecules in mesostructured sol-gel silicate films" *Journal of Sol-Gel Science and Technology* **2003**, 26(1-3), 571.
- Garcia-Macedo, J. A., Valverde; Cruz, D.; Franco, A.; Zink; J. I.; **Minoofar, P.;** "Structure and Polyphenylenevinylene Concentration Effect on the Photoconductive Response from Mesostructured Silica Films" *Journal of Physical Chemistry B* **2003**, 107, 2249-2252.
- **Minoofar, P.;** Franville, A.; Chia, S.; Hernandez, R.; Dunn, B.; Zink, J.; "Placement and Characterization of Pairs of Luminescent Molecules in Spatially Separated Regions of Nanostructured Thin Films" *Journal of the American Chemical Society* **2002**, 124(48), 14388.
- Hernandez, R.; Franville, A.; **Minoofar, P.;** Dunn, B.; Zink, J.; "Controlled Placement of Luminescent Molecules and Polymers in Mesostructured Sol-Gel Thin Films" *Journal of the American Chemical Society* **2001**, 123, 1248.
- Singer, F.; **Minoofar, P.** "Bisphosphonate Therapy of Osteoporosis", in *The Osteoporosis Primer*; Henderson, J., Goltzman, D., Eds.; Cambridge University Press: New York, **2000**.
- Singer, F.; **Minoofar, P.;** "Bisphosphonates in the Treatment of Disorders of Mineral Metabolism" *Advances in Clinical Endocrinology and Metabolism* **1995**, 6, 259.

### Invited Lectures

"Following primary hyperparathyroidism from surgery to proteomic analysis", 3rd Münster Conference on Single Analysis, December 5, 2006, Münster, Germany.

### Presentations

- Garcia-Macedo, J. A.; Cruz, D.; Valverde, G.; Zink, J.I.; Hernandez, R.; Minoofar, P.; "Charge transport under illumination in mesoporous continuous films." Proceedings of SPIE-The International Society for Optical Engineering, 2002, 4465(Organic Photovoltaics II): 137-142.
- Minoofar, P.; Zink, J. I.; "Multiple Inclusion and Energy Transfer in Mesostructured Sol-Gel Thin Films", Poster presented at the meeting of the Materials Research Society, April 2002, San Francisco, California.

### References

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