

Vinayak Rastogi

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OBJECTIVE: A challenging position in an innovation driven environment bringing my technical, management, interpersonal skills and more than 5 years of experience in colloidal science and nanoscale engineering to develop new products and processes and help bring about overall growth of business.

PROFILE: Research engineer with doctorate in chemical engineering and background in colloid science; Experienced in the development of immunoassays, microfabrication, sustained release, self-assembly, particle synthesis and surface functionalization, particle manipulation using electric and magnetic fields.

EDUCATION:

Ph.D. in Chemical Engineering, North Carolina State University, USA	Aug 2004 – Jan 2010, GPA: 3.84
M.S. in Chemical Engineering, North Carolina State University, USA	Aug 2004 – Oct 2006, GPA: 3.79
B.S. in Chemical Engineering, Indian Institute of Technology, Roorkee, INDIA	Jul 1998 – May 2002, GPA: 3.50

EXPERIENCE:

Research Experience

Visiting Researcher, Department of Chemical & Biomolecular Engineering, NCSU Jan 2010 – Present

Graduate Research Assistant, Department of Chemical & Biomolecular Engineering, NCSU Aug 2004 – Dec 2009

- Developed and characterized a novel microbioassay technique based on the agglutination of bio-functionalized micro and nanoparticles inside free floating droplets captured in place using a dielectrophoretic chip
- Devised a new method for inexpensive and scalable fabrication of ready to use, three dimensional meso-scale colloidal assemblies (supraparticles) using droplet templates dispensed on superhydrophobic surface
- Synthesized and performed surface functionalization of nanoparticles, acquired knowledge and skills for stability analysis of colloids
- Currently developing a microfluidic chip for the characterization of sustained release of drug/materials encapsulated in the supraparticles assembled using superhydrophobic substrates

Undergraduate Research, Indian Institute of Technology, Roorkee, INDIA Summer 2000

- Removal of non-biodegradable toxic organic pollutants from pulp and paper mill effluent by wet air oxidation

Work Experience

Software Engineer, Infosys Technologies Limited, INDIA Aug 2002 – July 2004

Summer Intern, Jubilant Organosys Limited, INDIA May 2003 – Jul 2003

RESEARCH PUBLICATIONS:

V. Rastogi, K. P. Velikov, and O. D. Velev; Microfluidic Characterization of Sustained Release from Porous Supraparticles, *Physical Chemistry and Chemical Physics* (in preparation)

V. Rastogi, A. A. Garcia, M. Marquez and O. D. Velev; Anisotropic particle synthesis using droplet templates on superhydrophobic surface, *Macromolecular Rapid Communications*, 31, 190-195 (2010) **Featured on the back cover of special issue on 'Multifunctional Micro- and Nanoparticles'**

V. Rastogi, S. Melle, O. G. Calderón, A. A. Garcia, M. Marquez and O. D. Velev; Synthesis of light-diffracting assemblies from microspheres and nanoparticles in droplets on a superhydrophobic surface, *Advanced Materials*, 20, 4263 (2008) **Featured on the cover of special issue on 'Frontiers in Nanoparticle Research'**

V. Rastogi and O. D. Velev; Development and Evaluation of Realistic Microbioassays in Freely Suspended Droplets on a Chip, *Biomicrofluidics* 1, 014107 (2007)

A. Garg, S. Saha, **V. Rastogi** and S. Chand; Catalytic wet air oxidation of pulp and paper mill effluent, *Indian Journal of Chemical Technology*, 10, 305 (2003)

CONFERENCE PROCEEDINGS:

V. Rastogi, A. A. Garcia, M. Marquez and O. D. Velev; Anisotropic Particle Assembly in Microdroplets Suspended on Superhydrophobic Substrate, *2009 MRS Spring Meeting*, San Francisco, CA, USA (2009)

V. Rastogi and O. D. Velev; Bioassays in freely suspended microliter droplets on a chip, *2009 MRS Spring Meeting*, San Francisco, CA, USA (2009)

V. Rastogi, D. M. Kuncicky, L. B. Jerrim and O. D. Velev; Scalable Meniscus-Directed Fabrication of Assemblies from Microspheres and Nanoparticles on Hydrophobic and Superhydrophobic Surfaces, *AIChE Annual Meeting*, Philadelphia, PA, USA (2008)

V. Rastogi, S. Melle, O. G. Calderón, A. A. Garcia, M. Marquez and O. D. Velev; Synthesis of light-diffracting assemblies using sessile droplet templates on a superhydrophobic surface, *SoftMatter*, Raleigh, NC, USA (2008)

V. Rastogi, S. Melle, O. G. Calderón, A. A. Garcia, M. Marquez and O. D. Velev; Synthesis of Light-Diffracting Colloidal Crystal Assemblies from Microspheres and Nanoparticles in Droplets on a Superhydrophobic Surface, *82nd ACS Colloid and Surface Science Symposium*, Raleigh, NC, USA (2008)

V. Rastogi and O. D. Velev; Development and Evaluation of Realistic Microbioassays in Freely Suspended Droplets on a Chip, *81st ACS Colloid and Surface Science Symposium*, Newark, DE, USA (2007)

V. Rastogi, S.-T. Chang and O. D. Velev; Microbioassays based on nanoparticle agglutination and evaporation driven separations inside droplets on a chip, *2007 MRS Spring Meeting*, San Francisco, CA, USA (2007)

S.-T. Chang, **V. Rastogi** and O. D. Velev; Evaporation driven particle microseparations in droplets on a Chip: Fundamentals and applications in materials assembly and microbioassays, *75th Gordon Conference (Colloidal, Macromolecular & Polyelectrolyte Solutions)*, Ventura, CA, USA (2006)

INVITED TALKS:

V. Rastogi and O. D. Velev; Microdroplet Engineering for Microbioassay and Synthesis of Functional Structured Porous Particles, *MRS NCSU Seminar Series*, Department of Material Science & Engineering, NCSU, Raleigh, NC, USA (2009)

V. Rastogi and O. D. Velev; Development and Evaluation of Realistic Microbioassays in Freely Suspended Droplets on a Chip, *Surfactants & Colloids Group Workshop*, University of Hull, Hull, UK (2007)

V. Rastogi and O. D. Velev; Synthesis of Diffracting Particle Assemblies on Superhydrophobic Surfaces, *Surfactants & Colloids Group Workshop*, University of Hull, Hull, UK (2007)

AWARDS & HONORS:

1st Place, *Edward M. Schoenborn Oral Presentation Competition*, CBE, NCSU (2008 – 2009)

3rd Place, *Edward M. Schoenborn Poster Presentation Competition*, CBE, NCSU (2007 – 2008)

Summer Undergraduate Research Award, Indian Institute of Technology, Roorkee, INDIA (Summer 2000)

PUBLICITY GENERATED:

Research published in *Advanced Materials* on colorful and spherical nanoscale assemblies on superhydrophobic surfaces hits the news headlines

Nature Chemistry: <http://www.nature.com/nchem/reshigh/2008/0808/full/nchem.50.html>

Science Daily: <http://www.sciencedaily.com/releases/2008/07/080730155342.htm>

PhysOrg.com: <http://www.physorg.com/news136647907.html>

Photonics.com: <http://www.photonics.com/content/news/2008/August/1/92734.aspx>

EurekAlert!: http://www.eurekalert.org/pub_releases/2008-07/asu-nme073008.ph

ACTIVITIES:

Member - American Chemical Society (ACS) (2008 – Present)

Member - Materials Research Society (MRS) (2007 – Present)

Secretary - Materials Research Society (MRS) NCSU Chapter (2008)

Executive Member - Organizing Committee ACS Colloids Symposium (2008)

Webmaster - Department of Chemical & Biomolecular Engineering, NCSU (2005 – 2009)

Webmaster - Velev Research Group (2005 – 2009)

REFERENCES:

Dr. Orlin D. Velev

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