

<i>Personal Information</i>					
<b>Name</b>	Choi, Chang Kyoung	<b>Gender</b>	Male	<b>Date of Birth</b>	03/03/1971
<b>Address</b>	<b>Home:</b> 1121 Walden legacy way #932, Knoxville, Tennessee 37931 <b>Office:</b> SERF 523, Department of Mechanical, Aerospace, and Biomedical Engineering, The University of Tennessee, Knoxville, Tennessee 37996, USA				
<b>Phone</b>	865-974-1167 (O), 865-712-2930 (C)		<b>E-mail</b>	cchoi2@utk.edu	

<i>Educational Experience</i>	
08/2004 ~ 07/2007	The University of Tennessee [GPA: 4.0/4.0] <span style="float: right;">Knoxville, Tennessee, USA</span> Ph.D. received from the Department of Mechanical, Aerospace, and Biomedical Engineering Advisor: Dr. Kenneth D. Kihm, Magnovox Endowed Chair Professor Co-advisor: Dr. Anthony E. English, Assistant Professor Dissertation Title: Development of an Integrated Opto-Electric Biosensor to Dynamically Examine Cytometric Proliferation and Cytotoxicity.
08/2002/ ~ 08/2004	Texas A&M University [GPA: 3.875/4.0] <span style="float: right;">College Station, Texas, USA</span> Ph.D. candidate in Mechanical Engineering Advisor: Dr. Kenneth D. Kihm, Professor
03/1999 ~ 02/2001	Chungang University [GPA: 4.0/4.0] <span style="float: right;">Seoul, Korea</span> M.S. in Mechanical Engineering Advisor: <i>Professor</i> Young Ki Choi Thesis Title: The Performance Analysis of the Plume Abatement NWD Cooling Tower
07/1997 ~ 01/1998	Mohawk College <span style="float: right;">Hamilton, Ontario, Canada</span> Diplomas for Completion of English as a Second Language (ESL) Courses and TOEFL Courses
03/1992 ~ 02/1999	Chungang University [GPA: 3.89/4.0] <span style="float: right;">Seoul, Korea</span> Graduated with <i>Magna Cum Laude</i> in the College of Engineering (1/445) B.S. in Mechanical Engineering

<i>Professional Experience</i>	
01/2008 ~	Oak Ridge National Laboratory <span style="float: right;">Oak Ridge, Tennessee, USA</span> Post-doc fellow in Biosciences Division
08/2007 ~ 01/2008	The University of Tennessee <span style="float: right;">Knoxville, Tennessee, USA</span> Post-doc fellow in Micro/Nano-scale Fluidics and Energy Transport Laboratory [MINSFET] & Environmental Carcinogenesis Laboratory
08/2004 ~ 07/2007	The University of Tennessee <span style="float: right;">Knoxville, Tennessee, USA</span> Graduate Research Assistant in Micro/Nano-scale Fluidics and Energy Transport Lab. [MINSFET]
08/2002/ ~ 08/2004	Texas A&M University <span style="float: right;">College Station, Texas, USA</span> Graduate Research Assistant in Micro-scale Fluidics and Heat Transport Laboratory
02/2002 ~ 07/2002	Seoul National University <span style="float: right;">Seoul, Korea</span> Research Assistant in Micro Thermal System Research Center [MTSRC]
08/2001 ~ 02/2002	Kyounggi Institute of Technology <span style="float: right;">Siheung, Korea</span> Lecturer for Mechanical Design
08/2001 ~ 07/2002	Anyang University <span style="float: right;">Angyang, Korea</span> Lecturer for Calculus and Mathematics in life

08/1999/ ~ 02/2001	Chungang University Teaching Assistant for Undergraduate Courses: Engineering Analysis (08/99 ~ 02/01), Computer Programming Practice [FORTRAN] (03/00 ~ 08/00), Refrigeration and Air Conditioning (03/00 ~ 08/00), Heat and Mass Transfer (09/00 ~ 02/01).	Seoul, Korea
03/1999 ~ 07/2002	Chungang University Graduate Research Assistant in Department of Mechanical Engineering (03/00 ~ 02/01) Graduate Research Assistant, Heat Transfer Lab. (03/99 ~ 07/02)	Seoul, Korea
03/1992 ~ 06/1994	Military Service: Sergeant, The Korean Army	

## *Research Interests*

### **1. Micro/Nano-Scale Optical Imaging (Microfluidics)**

- ✓ Microfabrication
- ✓ Confocal Laser Scanning Microscopy (CLSM) to measure the velocity field in a microchannel.
- ✓ Optical Serial Sectioning Microscopy (OSSM) to examine thermometry by detecting the free Brownian motion of nano-particles suspended in mediums at different temperatures.
- ✓ Total Internal Reflection Fluorescence Microscopy (TIRFM) to examine the hindered Brownian motion of nano-particles very close to a solid surface (within 1  $\mu\text{m}$ ).

### **2. Cytometric Analysis Using and Developing Opto-Electric Biosensors**

- ✓ Developed an opto-electric Indium Tin Oxide (ITO) biosensor
- ✓ Integrated dynamic live cell imaging system having the following optical techniques; Multi-spectrum Interference Reflection Microscopy (MS-IRM), TIRFM, Epi-fluorescence Microscopy, Phase Contrast Microscopy (PCM), and Differential Interference Contrast Microscopy (DICM).
- ✓ Simultaneous dynamic optical and electrical measurement using DICM image technique and electrical cell-substrate impedance sensing.
- ✓ *In vitro* cytotoxicity to examine the effect of a drug (cytochalasin D, a toxic agent) on cellular motility and cellular morphology.

### **3. Cell Proliferation and Cytotoxicity Studies Using Biochemical Sensors**

- ✓ Analysis for apoptosis, cytotoxicity, necrosis, and proliferation
- ✓ Adhesion protein analysis using IRCM & impedance measurement: LOX, COX1, & COX2
- ✓ Cell proliferation Test
- ✓ Flow cytometric analysis using FAC-Scan
- ✓ Fluorescence & Chemiluminescence Detection
- ✓ Western Blotting

*Refereed Journal Publications*

C. K. Choi, S. Baek, A. English, K. Kihm, Examination of Dose-dependent Focal/Close Contacts Changes in Endothelial Cells Using Interference Reflection Contrast Microscopy (IRCM), *Journal of Biomedical Optics*, Being submitted, 2008

C. K. Choi, S. Baek, A. English, K. Kihm, Dynamic electric-detection of cytometric adhesion and proliferation for overexpression cell lines in the human colorectal cancer cells, *Cancer Letters*, Preparation, 2008

C. K. Choi, C. H. Margraves, K. D. Kihm, and A.E. English, Dynamic Fingerprinting of Cellular Focal Contacts under Cytotoxic Conditions Using Quantitative Analysis of Natural Fringes, *Biosensor & Bioelectronics*, Being submitted, 2008

A. English, C.K. Choi, C. Margraves, and K. Kihm, A Statistical Geometric Analysis of Endothelial Cell Attachment to Electro-Optic Bioelectrodes, *Biophysical Journal*, Submitted, 2007

C.K. Choi, C. H. Margraves, A. English, and K. Kihm, Opto-Electric Cellular Biosensor Using Optically Transparent Indium Tin Oxide (ITO) Electrodes, *Sensors*, accepted, 2007

C.K. Choi, A. English, K. Kihm, and C Margraves, Dynamic Optical and Electrical Properties of Endothelial Cell Attachment on Indium Tin Oxide Bio-electrodes, *Journal of Biomedical Optics* Vol. 12, Issue 6, 064028, 2007

C.K. Choi, C. H. Margraves, and K. D. Kihm, Examination of Near-wall hindered Brownian diffusion of nanoparticles: Experimental validation of theories by Brenner (1961) and Goldman et al. (1967), *Physics of fluids*, Vol. 19, Issue 10, 103305, 2007

C.K. Choi, K. Kihm, and A. English, Opto-electric indium-tin-oxide (ITO) biosensor for simultaneous cellular imaging and micro-impedance analyses, *Optics Letters*, Vol. 32, Issue 11, pp1405-1407, 2007 **[selected for the June 15, 2007 issue of Virtual Journal of Biological Physics Research.]**

C.K. Choi, A. English, S. Jun, K. Kihm, and P. Rack, An Endothelial Cell Compatible Biosensor Fabricated Using Optically Thin Indium Tin Oxide Silicon Nitride Electrodes, *Biosensors and Bioelectronics*, Vol. 22, pp. 2585-2590, 2007

C. H. Margraves, C. K. Choi, and K. D. Kihm, Examination of the effect of salinity on the minimum elevation of nano-particles using ratiometric total internal reflection fluorescence microscopy (R-TIRFM), *Experiments in fluids*, Vol. 41, pp. 173-183, 2006

C. K. Choi and K. D. Kihm, Optical Tracking of Three-Dimensional Brownian Motion of Nanoparticles, *Journal of The Korean Society of Visualization*, Vol. 3, Issue 1, pp. 3-19, 2005

J.S. Park, C. K. Choi and K. D. Kihm, Temperature Measurement for Nanoparticle Suspension by detecting the Brownian Motion Using Optical Serial Sectioning Microscopy (OSSM), *Measurement Science and Technology*, Vol.16, pp. 1418-1429, 2005 **[Selected as one of the 2005 highlighted articles in MST - one of the very best contributions of the last year, and have received the highest praise from the Board and referees alike, whilst also being the most highly-downloaded articles throughout 2005]**

K. D. Kihm, A. Benerjee, C. K. Choi, and T. Takagi, Near-Wall Hindered Brownian Diffusion of Nanoparticles Examined By Three-Dimensional Ratiometric Total Internal Reflection Fluorescence Microscopy (3D R-TIRFM), *Experiments in Fluids*, Vol.37, Issue 6, pp. 811-824, 2004

Kenneth D. Kihm, Hyun-Jung Kim, Jae-Sung Park, Arindam Banerjee, Sang-Kwon Wee, C.K. Choi, Sok-Won Paik, Cheong-Su Seo, Heon-Ju Lee, Development and Applications of Advanced Flow Visualization Techniques for Microscale Heat and Mass Transport, *Journal of Flow Visualization and Image Processing*, Vol. 11, Issue3, pp. 153-176, 2004

J.S. Park, C. K. Choi and K. D. Kihm, Nanoparticle Tracking Using CLSM (Confocal Laser Scanning Microscopy) & OSSM (Optical Serial Sectioning Microscopy) Imaging, *ASME Journal of Heat Transfer*, Vol. 126, Issue 4, pp. 504, 2004

JS park, **C.K. Choi**, KD Kihm, Optically Sliced Micro-PIV Using Confocal Laser Scanning Microscopy (CLSM), *Experiments in Fluids*, Vol. 37, pp. 105-119, 2004

J.S. Park, **C. K. Choi** and K. D. Kihm, Optically-Sectioned Micro PIV Measurement Using Confocal Laser Scanning Microscopy (CLSM), *ASME Journal of Heat Transfer*, Vol.125, Number 4, pp. 542, 2003

**C.K. Choi** and Youngki Choi, A Numerical Study on the Performance Analysis of the Plume abatement NWD Cooling Tower, *Korean Journal of Air-Conditioning and Refrigeration Engineering*, Vol. 13, Number 11, 2001

**C.K. Choi** and Youngki Choi, Development of the Analysis Program of Smoke-free Cooling Tower, *Journal of The Research Institute of Production Engineering*, Vol. 9, Number 2, 2001

### *Conference Proceeding Publications*

J. Liggett, **C.K. Choi**, R. Donnell, A. English, K. Kihm, S. Baek, Expression of NUANCE, a potential novel oncogene, is inhibited by nonsteroidal anti-inflammatory drugs (NSAIDs) in human colorectal cancer cells, *FASEB Experimental Biology 2008, San Diego, California, April 5-9, 2008*

S. Lee, N. Whitlock, **C.K. Choi**, A. English, S. Safe, and S. Baek, Tolfenamic Acid Increases EGR-1 Expression through a PKC/ERK Dependent Pathway in Human Colorectal Cancer Cells, *FASEB Experimental Biology 2008, San Diego, California, April 5-9, 2008*

**C.K. Choi**, C. Margraves, A. English, and K. D. Kihm, Opto-electric Biosensor To Examine In Vitro Toxicity Stimuli To Endothelial Cell Motility And Morphology, *ASME 2007 Summer Biomedical Conference*, Keystone, Colorado, June 20-24, 2007

C. Margraves, **C.K. Choi**, A. English, K. D. Kihm, Seungho Lee, & Seung J. Baek, Quantitative Imaging of Nanoparticles and intracellular trafficking of vesicles using Total Internal Reflection Fluorescence Microscopy, *ASME 2007 Summer Biomedical Conference*, Keystone, Colorado, June 20-24, 2007

**C.K. Choi**, C. Margraves, and K. D. Kihm, Variabilities Affecting Near-Wall Diffusion of Nanoparticles Using 3D-TIRFM (Total Internal Reflection Fluorescence Microscopy), *6<sup>th</sup> International Symposium on Particle Image Velocimetry*, Pasadena, California, September 21-23, 2005

JS park, **C.K. Choi**, KD Kihm, Nano-PTV Using Cofocal Microscopy, *Proceedings of 2004 ASME Heat Transfer/Fluids Engineering Summer Conference Paper No. HT-FED2004-56653*, July 2004

### *Article in a Professional Magazine*

**C.K. Choi**, Micro/Nano- Scale Fluidics and Energy Transport (MINSFET) Laboratory, *KSME Journal*, Volume 44, pp 21-23, 2004

### *Honors and Awards*

2006/09	Received the Korean Honor Scholarship from the Embassy of the Republic of Korea in the USA
2002/08 ~ 2003/05	Scholarship from the Department of Mechanical Engineering in Texas A&M University
2000/03 ~ 2001/02	Full Meritorious Scholarship from Chungang University

1999/02	Received Honorary Certificate from the President of Chungang University [ <i>Magna Cum Laude</i> in the College of Engineering (1/445)]
1998/03 ~ 1998/08	Full Meritorious Scholarship from Chungang University
1996/09 ~ 1997/08	Full Meritorious Scholarship from Chungang University
1996/03 ~ 1996/08	Scholarship from Chungang University
1995/09 ~ 1996/02	Full Meritorious Scholarship from Chungang University
1993/12	Received an Honorary Certificate from the Commander of the Army Corps
1993/06	Won the First Prize in an Intramural Oratorical Contest held in the Korean Army Corps
1992/03, 95/03~95/08	Meritorious Scholarship from Chungang University since I entered second on the Department of Mechanical Engineering
1998/11	Won the Silver Prize at the Chinese Calligraphy contest of 36th Gaecheon Art Festival, Jinju-si, Gyeongsangnam-Do, Korea

### *Proposal Writing*

- Future Promising Pioneering Research (KOSEF): SmartCELL<sup>3D</sup>: Simultaneous Multiple 3D Analysis using Renovative Test-platform for live Cells
- Development of Nano/Bio-Technology and Tool:  
Title: Discovery of Microthermal and Nanofluidic Marks for Improved Throughput Screening of Cancer/Stem Cells
- AHA proposal
- NIH proposal for the effects of phytochemicals on  $\beta$ -catenin translocation in colorectal cancer cells
- Developing New Technology to Analyze Hydrolysis of Cellulose Enzyme

### *Synergistic Activities*

- Reviewer for the American Society of Mechanical Engineers (ASME) (12/2004 ~ Present)
- Reviewer at Experiments in Fluids (08/2003 ~ Present)
- Kendo Member at Southeast US Kendo Federation (SEUSKF) and America US Kendo Federation (AUSKF) (11/2004 ~ Present)
- Volunteer to Teach Korean/Chinese Calligraphy in Knoxville Korean School
- Volunteer to Teach Kids Soccer at American Youth Soccer Association (AYSO): Region275 in Knoxville
- Soccer Member at KASC, Korean Aggie Soccer Club, Texas A&M University (08/2002 ~ 07/2004)
- Advisor for NSTOPO: Automotive Research Group, Department of Mechanical Engineering, Chungang University (03/1998~02/2000)
- I had helped handicapped children at “Yangji House” once a month from 11/1998 to 03/2001
- Soccer Member at Seokkisidai, Chungang University (03/1995 ~ 02/2000)

<i>References</i>			
<i>Name</i>	<i>Address</i>	<i>Email</i>	<i>Phone</i>
Dr. Kenneth D. Kihm, Magnovox Endowed Chair Professor	407 Dougherty Engineering Building, Department of Mechanical, Aerospace, and Biomedical Engineering, The University of Tennessee, Knoxville, TN 37996	kkihm@utk.edu	(865)974-5292
Dr. Anthony E. English, Assistant Professor	308 Perkins Hall, Department of Mechanical, Aerospace, and Biomedical Engineering, The University of Tennessee, Knoxville, TN 37996	tenglish@utk.edu	(865)974-8392
Dr. Seung J. Baek, Assistant Professor	2407 River Drive Rm. A228, Department of Pathobiology, The University of Tennessee, Knoxville, TN 37996	sbaek2@utk.edu	(865)974-8216
Dr. Young Ki Choi, Professor	The Department of Mechanical Engineering, Heuksuk-dong 221, Dongjak-gu, Seoul, Korea	ykchoi@cau.ac.kr	82-2-820-5281