# Chi-Chih (Ginny) Kang, Ph.D.

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## Professional Overview:

Extensive hands-on technical experiences in assay development, molecular biology, cell biology and optical imaging of small molecules and biologics in cancer diagnostics and cancer therapeutics. Great interest in studying translational research and high throughput assays.

## Qualifications:

- **Technical Skills:**
  - Photolithography
  - Molecular Biology (siRNA knockdown experiment, qRT-PCR, Molecular cloning, Luciferase reporter system)
  - Cell Biology (Tissue culture, Primary tissue culture, Cell-based Assay, Organelle purification)
  - Biochemistry (Western blot, 2D-gel, Immuno-precipitaion, ELISA)
  - Optics (Confocal Microscopy, Flow Cytometry, Conventional Spectroscopy)
  - Experienced and efficient in grant proposals and scientific manuscript preparation
- **Interpersonal Skills:**
  - Strong interpersonal communication skills and an effective team player in a group settings
  - Exceptional skills in interdisciplinary collaboration (Chemistry- Biology-Clinic)

## Accomplishments:

- **Honors:**
  Best Ph.D. thesis in "2010 Novel Drug Development" selected by the Chinese Chemical Society in Taiwan
- **Patents:**
  "Cancer cell detecting devices" (US Patent: 20070098233)
  "Fluorescent carbazole compounds for cancer diagnosis" (US Patent: 20110111429)

## Education:

- **2011, MBA-209f, Business Fundamentals| An introductory course at the Haas Business School, UC Berkeley**

- **Ph.D, 2004-2009**
  **Molecular Science Technology (MST) Program of Taiwan International Graduate Program (TiGP) Joint program of Academia Sinica and National Tsing-Hua University, Taipei, Taiwan**

- **B.S., 2000-2004: Department of Plant Pathology and Microbiology, National Taiwan**

**University, Taipei, Taiwan. Graduated with the highest honor of the class.**

## Professional Experience:

- **Apr, 2013- Present: Postdoctoral fellowship, Department of Bioengineering, University of California Berkeley, USA. Advisor: Professor Amy Herr**

- **Apr, 2011- Mar, 2013: Postdoctoral fellowship, Life Sciences Division, Lawrence Berkeley National Laboratory, USA. Advisor: Professor Paul Yaswen**
  - Research Project 1 (April 2011 – April 2012): The molecular mechanism study of reversible and irreversible senescence in breast cancer cells
    - Awarded one-year funding (Apr 2011-Apr 2012) of "Postdoctoral Research Abroad Program" from Department of International Cooperation, National Science Council, Taiwan
    - Established Tet inducible breast cancer cell lines.
    - Measured cell cycle, cell proliferation and cellular senescence by PI staining, EDU, colony forming assay, SAHF (Senescence associated heterochromatin foci), β-galactosidase assay.
    - Skilled in immunoprecipitation, western blot and 2D gel to measure the protein expression and phosphorylation profile.
  - Research Project 2 (May 2012 – Mar 2013): The inflammatory response induced by low dose radiation in human mammary epithelial cells
    - Part of the "Low Dose Radiation Research Program" funded by U.S. Department of Energy (DOE) Scientific Focus Area (SFA)
    - Performed qRT-PCR to evaluate the RNA expression of cytokines
    - Performed luciferase assay to evaluate the protein activation of NF-kB using the reporter system
    - Evaluated the microenvironment and cell-cell communication effect in IR induced cytokine expression and NFkB signaling.
- **Jan, 2010- Mar, 2011: Postdoctoral fellowship, Institute of Atomic and Molecular Sciences, Academia Sinica, Taiwan**
  - Chemical engineering of fluorescence probes in achieving intracellular selectivity for cancer diagnosis
    - Mentored two graduated students in cellular studies (cell viability, invasion assay) of fluorescence probes in multidrug resistance and invasion systems.
    - Established structure activity relationship studies for screening fluorescence probes (BMVC derivatives) in cancer diagnosis.
- **Ph.D, 2004-2009**
  **Molecular Science Technology (MST) Program of Taiwan International Graduate Program**

**(TiGP) Joint program of Academia Sinica and National Tsing-Hua University**
**Taipei, Taiwan**

- Ph D. Thesis: BMVC related molecules in cancer research: cancer diagnosis and photodynamic therapy. Advisor: Dr. Ta-Chau Chang
    - Characterized the cellular response of a small organic molecule, BMVC in lung carcinoma (H1299), lung adenocarcinoma (CL1-0) and normal lung fibroblast (MRC-5) cell lines.
    - Designed the staining protocol for applying BMVC in screening single cancer cells.
    - Collaborated with Dr. Ji-Yen Cheng in Academia Sinica to develop a microfluidic device for utilizing BMVC in cancer diagnosis.
    - Collaborated with Dr. Pei-Jen Lou, Dr. I-Shiow Jan in National Taiwan University Hospital for applying BMVC in screening head and neck tumors from fine needle aspiration samples, and tumors from pleural effusion.
    - Conducted siRNA experiments to identify the transport proteins for BMVC in cancer cells.
    - Set up real time imaging system and procedures for evaluating the photodynamic therapeutic effect of *o*-2B-P in cancer cells.
    - Employed confocal spectral imaging for studying pH sensitive probes between cancer and normal cells.

- **Aug-Oct, 2008: Visiting Student, Department of Molecular Biology, University of Texas Southwestern Medical Center, USA. Advisor: Professor Lily Huang**
    - Study the effect of clathrin dependent or caveolae dependent endocytosis pathway on BMVC.
    - Learned *in vivo* bioimaging of BMVC in MCF-7 planted nude mice.
    - Learned microinjection experiment in Prof. Joachim Seemann's lab.
- **Summer, 2006: Visiting Student, Department of Chemistry, Iowa State University, USA. Advisor: Professor Edward S. Yeung**
    - Designed and developed a simple method and device aiming for the diagnosis of cancer cells from normal cells.
    - Learned single molecule detection of enzyme kinetics by means of total internal reflection fluorescence microscopy (TIRFM).
- **2003: National Science Council Undergrad Student Research Project, Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan. Advisor: Professor Ta-Chau Chang**
    - Title: "Investigation of selectivity of ligand to human quadruplex structure"
        - Learned Surface Enhanced Raman Spectroscopy (SERS), competition dialysis, Circular Dichroism (CD), absorption and fluorescence.

**Publications:**

1). **C.-C. Kang**, C.-C. Chang, J.-Y. Cheng and T.-C. Chang, "Simple method in diagnosing cancer cells by a novel fluorescence probe BMVC" ***Journal of the Chinese Chemical Society***, **2005,** *52*, 1069-1072

2). C.-C. Chang, J.-F. Chu, H.-H. Kuo, **C.-C. Kang**, S.-H. Lin, T.-C. Chang, "Solvent effect on photophysical properties of a fluorescence probe: BMVC" ***Journal of Luminescence***, **2006,** *119*, 84-90.

3). Y.-L. Tsai, C.-C. Chang, **C.-C. Kang** and T.-C. Chang, "Effect of different electronic properties on 9-aryl-substituted BMVC derivatives for new fluorescence probes" ***Journal of Luminescence***, **2007**. 127, 41-47.

4). C.-C. Chang, C.-W. Chien, Y.-H. Lin, **C.-C. Kang** and T.-C. Chang, "Investigation of spectral conversion of $d(TTAGGG)_4$ and $d(TTAGGG)_{13}$ upon potassium titration by a G-quadruplex recognizer BMVC molecule" ***Nucleic Acids Research***, **2007,** 35, 2846-2860.

5). **C.-C. Kang**, C.-C. Chang, T.-C. Chang, L.-J. Liao, P.-J. Lou and W. J. Xie and E. S. Yeung, "A handheld device for potential point-of-care screening of cancer" ***Analyst***, **2007**. 132, 745-749.

6). **C.-C. Kang**, C.-T. Chen, C.-C. Cho, Y.-C. Lin, C.-C. Chang, and T.-C. Chang, "A dual selective antitumor agent and fluorescence probe: the binary BMVC-porphyrin photosensitizer." ***ChemMedChem***, **2008**, 3, 725-728.

7). L.-J. Liao, **C.-C. Kang**, I-S. Jan, H.-C. Chen, C.-L. Wang, P.-J. Lou, T.-C. Chang, "Improved diagnostic accuracy of malignant neck lumps by a simple BMVC staining assay" ***Analyst***, **2009**, 134, 708-711.

8). **C.-C. Kang**, W.-C. Huang, C.-W. Kouh, Z.-F. Wang, C.-C. Cho, C.-C. Chang, C.-L., Wang, T.-C. Chang, J. Seemann, L.J-S. Huang, "Chemical principles for the design of a novel fluorescent probe with high cancer-targeting selectivity and sensitivity" ***Integrative Biology***, **2013**, DOI: 10.1039/C3IB40058A

9). I-T. Lin, Y.-L. Tsai, **C.-C. Kang**, W.-C. Huang, C.-L. Wang, P.-J. Lou, I-S. Jan, T.-C. Chang, "BMVC test, an improved fluorescence assay for detection of malignant pleural effusions" Submitted to ***Clinical Chemistry***.

**Presentations:**

- "Investigation of BMVC transport between cancer and normal cell lines" (Poster)
  -3rd AACR International Conference on Molecular Diagnostics in Cancer Therapeutic Development, Philadelphia, USA, Sep 22-25, 2008
- "A fluorescence probe for cancer research" (Oral and Poster)
  -Meeting of Dynamic and Spectroscopy of Small Molecules and Biomolecules, Taipei, Taiwan, Nov 9-12, 2008
- "The mechanism and structure localization relationship studies of a small organic molecule as a fluorescent tumor marker" (Poster)

-AACR Annual Meeting, Washington D.C., USA, Apr 17-21, 2010

- “Long term effects of radiation on NFκB activation and cytokine signaling” (Poster)
  -2012 BioSciences Young Investigator Retreat, Berkeley, USA, Nov 30, 2012.