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EDUCATION

1990	Ph.D. in Physical Chemistry (with Professor George E. Ewing) Indiana University, Bloomington, Indiana, USA
1983	M.S. in Agricultural Chemistry (with Professor Kun-Huang Houg) National Taiwan University
1981	B.S. in Agricultural Chemistry, National Taiwan University

ACADEMIC POSITIONS

8/2016 – present	Joint Appointment Professor Department of Chemistry, National Taiwan Normal University
8/2014 – present	Honorary Chair Professor Department of Chemical Engineering, National Taiwan University of Science and Technology
7/2013 – present	Distinguished Research Fellow Institute of Atomic and Molecular Sciences, Academia Sinica
8/2007 – 7/2012	Joint Appointment Professor Department of Chemistry, National Taiwan University
8/2004 – 7/2009	Joint Appointment Professor Department of Chemistry, National Taiwan Normal University
3/2000 – 7/2013	Research Fellow Institute of Atomic and Molecular Sciences, Academia Sinica
2/2002 – 7/2003	Adjunct Professor Department of Chemistry, National Taiwan Normal University
8/2000 – 1/2001	Adjunct Professor Department of Chemistry, National Taiwan University
7/1995 – 12/1995	Visiting Scientist (with Professor Yuan T. Lee) Department of Chemistry, University of California, Berkeley, California, USA
1/1994 – 3/2000	Associate Research Fellow Institute of Atomic and Molecular Sciences, Academia Sinica
7/1990 – 12/1993	Postdoctoral Fellow (with Professor William A. Klemperer) Department of Chemistry, Harvard University, Cambridge, Massachusetts, USA
8/1983 – 7/1984	Research Assistant Department of Chemistry, National Taiwan University

ACADEMIC SERVICES

2018	Chairman 10th Asian Photochemistry Conference (APC2018)
1/2015 – 12/2018	Councilor Asian and Oceanian Photochemistry Association (APA)
1/2012 – 9/2016	Deputy Executive Secretary Central Academic Advisory Committee, Academia Sinica

- 1/2012 – 12/2013 Coordinator
Molecular Science and Technology Program, Taiwan International
Graduate Program (TIGP), Academia Sinica
- 1/2006 – 9/2014 Associate Editor
Journal of the Chinese Chemical Society, Taipei
- 1/2005 – 12/2007 Panel Member
Division of Chemistry, National Science Council

HONORS AND AWARDS

- 2023 FutureTech Award, National Science and Technology Council (國科會未來科技獎)
- 2021 Academic Achievement Award, Chemical Society Located in Taipei (中國化學會學術獎章)
- 2021 National Innovation Excelsior Award of Taiwan Government (國家新創精進獎)
- 2020 Outstanding Research Award, Taiwan Nanomedicine Society (臺灣奈米生醫學會傑出研究獎)
- 2019 Best Article Award, Journal of the Chinese Chemical Society, Taipei (中國化學會會誌108年度最佳論文獎)
- 2019 National Innovation Award of Taiwan Government (第16屆國家新創獎)
- 2019 The Franco-Taiwanese Scientific Grand Prize (台法科技獎)
- 2019 – 2023 Academia Sinica Investigator Award (中央研究院深耕計畫)
- 2017 Far Eastern Y. Z. Hsu Chair Professor (有庠科技講座)
- 2017 FutureTech Demo and Breakthrough Award, Ministry of Science and Technology (科技部未來科技突破獎)
- 2015 Outstanding Research Award, Ministry of Science and Technology (科技部傑出研究獎)
- 2014 Ho Chin Tui Award (侯金堆傑出榮譽獎)
- 2014 Best Article Award, Journal of the Chinese Chemical Society, Taipei (中國化學會會誌103年度最佳論文獎)
- 2014 – 2017 Science Vanguard Research Program, Ministry of Science and Technology (科技部卓越領航研究計畫)
- 2013 – 2017 Academia Sinica Investigator Award (中央研究院深耕計畫)
- 2010 – 2013 Science Vanguard Research Program, National Science Council (國科會卓越領航研究計畫)
- 2008 Academic Award of Ministry of Education (第52屆教育部學術獎)
- 2007 – 2011 Outstanding Scholar Award of Foundation for the Advancement of Outstanding Scholarship (傑出人才基金會傑出人才講座)
- 2007 – 2011 Academia Sinica Investigator Award (中央研究院深耕計畫)
- 2003 Outstanding Research Award, National Science Council (國科會傑出研究獎)
- 2001 Distinguished Young Researcher Award of Tsing-Hua Foundation of Chemistry Technology (第2屆清華化學科技文教基金會傑出青年學者)
- 1998 Academia Sinica Research Award for Junior Researchers (中央研究院年輕學者著作獎)

INVITED INTERNATIONAL LECTURES

- “Nanodiamonds with fluorescent quantum defects for bioimaging and biosensing applications,” in 1st International Symposium on Carbon Materials (2023 ISCM-1) for Energy, Environment, Sustainability, and Bio-applications, Tainan, Taiwan (Jan. 31 – Feb. 3,

2023).

- “Nitrogen-vacancy centers in nanodiamonds as temperature sensors and immunoassay reporters,” in Quantum Innovation 2021, the International Symposium on Quantum Science, Technology and Innovation, Tokyo, Japan (December 7-9, 2021).
- “Fluorescent nanodiamonds: Past, present, and future,” in Université Paris-Saclay, Cachan, France (November 25, 2019).
- “Diamond nanothermometry with nitrogen-vacancy centers,” in 21th Takayanagi Memorial Symposium, Hamamatsu, Japan (November 12, 2019).
- “Nanodiamond-enabled biotechnology,” in 14th Asian Congress on Biotechnology (ACB2019), Taipei, Taiwan (July 1-4, 2019).
- “Fluorescent nanodiamond: A versatile nanomaterial for bioimaging and quantum sensing,” in 2019 New Diamond and Nano Carbon Conference (NDNC 2019), Hua-Lien, Taiwan (May 12-17, 2019).
- “Nanodiamonds for nanomedicine,” in 2018 Taiwan-Japan-Korea Trilateral Conference on Nanomedicine, Tainan, Taiwan (December 13-14, 2018).
- “Promise and potential of fluorescent nanodiamonds for biomedical applications,” in Institute for Protein Research, Osaka University, Japan (November 29, 2018).
- “Bioimaging and biosensing with fluorescent nanodiamonds in cells,” in The 41st Annual Meeting of the Molecular Biology Society of Japan (MBSJ2018), Yokohama, Japan (November 28-30, 2018).
- “Fluorescent nanodiamonds: Fabrication, properties, and applications,” in 2017 International Conference of Functional Carbons (ICFC 2017), Taipei, Taiwan (November 1-4, 2017).
- “Nanoscale temperature sensing in cells with nitrogen-vacancy centers in fluorescent nanodiamonds,” in QST International Symposium, Chiba, Japan (July 25-26, 2017).
- “Materials science and technology for quantum sensing,” in Quantum Sensing Gordon Research Conference, Hong Kong, PR China (July 2-7, 2017).
- “Luminescence nanothermometry with nitrogen-vacancy centers in nanodiamonds,” in 9th Asian Photochemistry Conference (APC 2016), Singapore (December 4-8, 2016).
- “Long-term cell tracking and nanoscale temperature sensing with fluorescent nanodiamonds,” in JSAP-OSA Joint Symposia, Niigata City, Japan (September 13-16, 2016).
- “Fluorescent nanodiamonds for long-term cell tracking and nanoscale temperature sensing,” in 2016 Spring MRS Meeting, Phoenix, AZ, USA (March 28 - April 1, 2016).
- “Optical bioimaging with fluorescent nanodiamonds,” in Focus on Microscopy 2016, Taipei, Taiwan (March 20-23, 2016).
- “Diamonds in space,” in 11th Pacific Rim Conference on Stellar Astrophysics – Physics and Chemistry of the Late Stages of Stellar Evolution, Hong Kong, PR China (December 14-17, 2015).
- “Time-resolved luminescence nanothermometry with nitrogen-vacancy centers in nanodiamonds,” in AVS 62nd International Symposium and Exhibition, San Jose, CA, USA (October 18-23, 2015).
- “Engineering fluorescent nanodiamonds for nanomedicine applications,” in Second Israel-Taiwan Conference – from Basic to Translation Research in Life Sciences, Tel-Aviv, Israel (June 6-7, 2015).
- “Bioimaging and quantum sensing using nitrogen-vacancy centers in nanodiamonds,” in SPIE Photonics West, San Francisco, CA, USA (February 7-12, 2015).
- “Bioimaging and quantum sensing with fluorescent nanodiamonds,” in 2015 International Symposium toward the Future of Advanced Researches in Shizuoka University, Hamamatsu, Shizuoka, Japan (January 27-28, 2015).

- “Bioimaging and quantum sensing using nitrogen-vacancy centers in nanodiamonds,” in Frontiers in Optics 2014/Laser Science XXX (FiO/LS), Tucson, Arizona, USA (October 19-23, 2014).
- “Bioimaging and quantum sensing using nitrogen-vacancy centers in nanodiamonds,” in Spring 2014 E-MRS, Lille, France (May 26-30, 2014).
- “Ion-irradiated nanodiamonds as versatile contrast agents for bioimaging,” in MRS 2014 Spring Meeting and Exhibit, San Francisco, CA, USA (April 21-25, 2014).
- “Stem cell tracking using fluorescent nanodiamonds,” in 7th Pan Pacific Symposium on Stem Cells and Cancer Research (PPSSC), Taichung, Taiwan (April 12-14, 2014).
- “Bioconjugated nanodiamonds for optical imaging and therapeutic applications,” in MRS-ASAP Nanodiamond Symposium, Kyoto, Japan (September 16-20, 2013).
- “Highly fluorescent nanodiamonds protein-functionalized for fluorescence lifetime imaging *in vitro* and *in vivo*,” in Workshop on Diamond: Spintronics, Photonics, Bio-applications, Hong Kong SAR, China (April 27-29, 2013).
- “High-brightness fluorescent nanodiamonds for *in vivo* applications,” in SPIE Photonics West, San Francisco, CA, USA (February 2-7, 2013).
- “Fabrication and characterization of fluorescent nanodiamonds for bioimaging applications,” in Department of Physics, The Chinese University of Hong Kong (CUHK), Hong Kong SAR, China (April 27, 2012).
- “Fluorescent nanodiamonds for *in vitro* and *in vivo* applications,” in MRS 2012 Spring Meeting and Exhibit, San Francisco, CA, USA (April 9-13, 2012).
- “*In vitro* and *in vivo* applications of fluorescent nanodiamonds,” in SPIE Photonics West, San Francisco, CA, USA (January 21-26, 2012).
- “Development and use of functionalized fluorescent nanodiamonds,” in MRS 2011 Spring Meeting and Exhibit, San Francisco, CA, USA (April 25-29, 2011).
- “Nanodiamonds for optical bioimaging,” in 476th Wilhelm and Else Heraeus-Seminar on Diamond: Spintronics, Photonics, Bio-applications, Bonn, Germany (April 4-7, 2011).
- “Fluorescent nanodiamonds for super-resolution bioimaging and long-term cell tracking,” in 76th Israel Chemical Society Annual Meeting, Tel-Aviv, Israel (February 9-10, 2011).
- “Functionalized fluorescent nanodiamond as a novel material for bioimaging applications,” in E-MRS 2010 Spring Meeting, Strasbourg, France (June 7-11, 2010).
- “Functionalized fluorescent nanodiamonds for biological applications,” in 239th ACS National Meeting and Exhibition, San Francisco, CA, USA (March 21-25, 2010).
- “Spectroscopy of fluorescent nanodiamonds as photostable biolabels and fluorescence resonance energy transfer donors,” in 2nd Asian Spectroscopy Conference, Seoul, South Korea (November 30 - December 2, 2009).
- “Functionalized fluorescent nanodiamonds for biological applications,” in 2nd International Conference on New Diamond and Nano Carbon (NDNC-2008), Taipei, Taiwan (May 26-29, 2008).
- “Measuring masses of single viruses and biological cells with a quadrupole ion trap,” in Center of Excellence in Analytical Chemistry (CEAC), ETH, Zurich, Switzerland (January 18, 2007).
- “Biotechnological applications of nanodiamonds,” in 17th European Conference on Diamond, Diamond-Like Materials, Carbon Nanotubes and Nitrides, Estoril, Portugal (September 3-8, 2006).
- “Studying biomolecular complexes with infrared photodissociation spectroscopy and ion cyclotron resonance mass spectrometry,” in International Conference on Physics Education and Frontier Physics, the 5th Joint Meeting of the Chinese Physicists Worldwide (OCPA5), Taipei, Taiwan (June 27-30, 2006).

- "Studying noncovalent biomolecular complexes with infrared photodissociation spectroscopy in an ion cyclotron resonance cell," in Sendai International Symposium on Molecular Cluster Spectroscopy, Sendai, Japan (May 29-30, 2006).
- "Laser-induced acoustic desorption mass spectrometry of single viruses and biological cells," in 7th Asia-Pacific Conference on Human Genetics (HUGO-AP2006), Taipei, Taiwan (March 6-10, 2006).
- "Microsolvation of protons in gas-phase water and biomolecular clusters," in Pacifichem2005, Honolulu, Hawaii, USA (December 15-20, 2005).
- "Probing adsorption and conformational change of interfacial proteins with total internal reflection spectroscopy," in Pacifichem2005, Honolulu, Hawaii, USA (December 15-20, 2005).
- "Solid phase extraction and elution on diamond (SPEED): A fast and general method for proteome analysis with mass spectrometry," in 8th Asian Conference on Analytical Sciences, Taipei, Taiwan (October 16-20, 2005).
- "Characterization of noncovalent biomolecular complexes in an ion cyclotron resonance cell with infrared spectroscopy," in 11th Asian Chemical Congress (ACC), Seoul, Korea (August 24-26, 2005).
- "Studies of protonated water clusters: From 2-mers to 21-mers," in Gordon Research Conferences on Molecular & Ionic Clusters, Aussois, France (September 5-10, 2004).
- "Measuring masses of single *Escherichia coli* K-12 whole cells in vacuo," in 52nd Annual ASMS Conference on Mass Spectrometry and Allied Topics, Nashville, Tennessee, USA (May 22-27, 2004).
- "Studies of molecular cluster ions: From hydrated protons to protonated biomolecules in the gas phase," in Royal Australian Chemical Institute (RACI) Conference on Physical Chemistry 2004, Hobart, Australia (February 1-5, 2004).
- "Competitive proton solvation between CH₃OH and H₂O in protonated mixed methanol-water clusters," in XXIst International Conference on Photochemistry (ICP21), Nara, Japan (July 26-31, 2003).
- "Hydrogenated diamond nanoparticles in space," in Fifth Asian International Seminar on Atomic and Molecular Physics, Nara, Japan (October 2-5, 2002).
- "Laser-induced fluorescence ion trap mass spectrometry of nanoparticles," in Institut fuer Physik, Technische Universitaet Chemnitz, Germany (August 19, 2002).
- "Infrared spectroscopy and mass spectrometry of nanodiamonds," in Institut fuer Physik, Technische Universitaet Chemnitz, Germany (August 16, 2002).
- "Ionic clusters," Discussion leader in Gordon Research Conferences on Molecular and Ionic Clusters, Ventura, California, USA (January 6-11, 2002).
- "Model studies of partial hydration of protonated peptides in the gas phase by infrared spectroscopy and ab initio calculations," in Gordon Research Conferences on Biological Molecules in the Gas Phase, New London, Connecticut, USA (June 10-15, 2001).
- "Hydrogen bond rearrangement dynamics of cluster ions containing an excess proton," in the Third Joint Meeting of Chinese Physicists World-Wide, Hong Kong (July 31 - August 4, 2000).
- "Hydrogen bond rearrangement and intermolecular proton transfer in protonated water clusters," in Gordon Research Conferences on Gaseous Ions: Structures, Energetics, and Reactions, Ventura, California, USA (February 28 - March 5, 1999).
- "Hydrogen bond rearrangement and solvation-induced proton transfer in protonated molecular clusters," in Research Workshop of the Israel Science Foundation: Proton Solvation and Proton Mobility, Neve Ilan, Israel (October 18-22, 1998).
- "Structure, isomeric transition, hydrogen bond rearrangement and solvation-induced proton transfer in protonated cluster ions," in Institut fuer Physikalische und Theoretische Chemie, Technische Universitaet Muenchen, Germany (July 16, 1998).

- “Structure, isomeric transition and proton transfer in protonated molecular clusters,” in Institut fuer Physik, Technische Universitaet Chemnitz, Germany (July 15, 1998).
- “Spectroscopy, energy flow and chemistry of adsorbates on dielectric single crystal surfaces,” in Institut fuer Physik, Technische Universitaet Chemnitz, Germany (July 10, 1998).
- “The structures and clustering kinetics of isomeric $\text{NH}_4^+(\text{H}_2\text{O})_{3-6}$ in a free jet expansion: From single to double rings,” in Symposium on Frontiers of Chemistry, the Second Conference for Worldwide Chinese Young Chemists, Kowloon, Hong Kong (December 20-23, 1997).
- “Infrared spectroscopic studies of vibrational relaxation and hydrogen etching on diamond single and nanocrystal surfaces,” in The Second Joint Meeting of the World-Wide Chinese Physicists in Honor of Prof. Ta-Yu Wu on the Occasion of His 90th Birthday, Taipei, Taiwan (August 11-15, 1997).
- “High overtone spectroscopy and photodissociation of molecular complexes,” in Department of Chemistry, Indiana University, Bloomington, IN, USA (February 11, 1994).
- “High overtone spectroscopy and photodissociation of molecular complexes,” in Department of Chemistry, Harvard University, Cambridge, MA, USA (February 3, 1994).

PROFESSIONAL MEMBERSHIPS

- Member, American Chemical Society (ACS)
- Full Member, Taiwan Society for Mass Spectrometry (TSMS)
- Full Member, Chinese Chemical Society (CCS)

STUDENT AND POSTDOCTORAL ADVISEES

• *Postdoctoral Researchers*

Yong Cai, Ph.D.
 Hai-Chou Chang, Ph.D.
 Chanchal Chaudhuri, Ph.D.
 Jeson Chen, Ph.D.
 Yen-Wei Chen, Ph.D.
 Chia-Liang Cheng, Ph.D.
 Orestis Faklaris, Ph.D.
 Yuri D. Glinka, Ph.D.
 Wesley W.-W. Hsiao, Ph.D.
 L.-C. Lora Huang, Ph.D.
 Yuen Yung Hui, Ph.D.
 Jyh-Chiang Jiang, Ph.D.
 Xianglei Kong, Ph.D.
 Trong-Nghia Le, Ph.D.
 Hung-Cheng Li, Ph.D.
 Yingqi Li, Ph.D.
 Chih-Kai Lin, Ph.D.
 Hsin-Hung Lin, Ph.D.
 Yen-Yiu Liu, Ph.D.
 Nitin Mohan, Ph.D.
 Zongxiu Nie, Ph.D.
 Dinh Minh Pham, Ph.D.
 Hualin Shu, Ph.D.
 Shingo Sotoma, Ph.D.
 Pei-Chang Tsai, Ph.D.
 V. Vijayanthimala, Ph.D.
 Yi-Sheng Wang, Ph.D.
 Chih-Che Wu, Ph.D.
 Teng-I Yang, Ph.D.

Bailin Zhang, Ph.D.
Zhiqiang Zhu, Ph.D.

- **Ph.D. Students**

Yi-Sheng Wang, Ph.D. 2001
Chih-Che Wu, Ph.D. 2002
Wen-Ping Peng, Ph.D. 2004
Tse-Luen Wee, Ph.D. 2008
Nitin Mohan, Ph.D. 2011
V. Vijayanthimala, Ph.D. 2011
Yan-Kai Tzeng, Ph.D. 2014
Chia-Yi Fang, Ph.D. 2014
Chandra Prakash Epperla, Ph.D. 2016
Long-Jyun Su, Ph.D. 2018
Feng-Jen Hsieh, Ph.D. 2019
Be-Ming Chang, Ph.D. 2019
Terumitsu Azuma, Ph.D. 2021

- **M.S. Students**

More than 30 students: Shan-Jen Kuo *et al.*

PUBLICATIONS AND PATENTS

- **Books**

1. Y. Y. Hui, H.-C. Chang, H. Dong, and X. Zhang (Eds.), *Carbon Nanomaterials for Bioimaging, Bioanalysis, and Therapy*, Wiley (2019) (376pp).
2. H.-C. Chang, W. W.-W. Hsiao, and M.-C. Su, *Fluorescent Nanodiamonds*, Wiley (2019) (296pp).

- **Research Articles**

239. T.-N. Le, M. J. N. Descanzo, W. W.-W. Hsiao, P.-C. Soo, W.-P. Peng, and H.-C. Chang*, "Fluorescent nanodiamond immunosensors for clinical diagnostics of tuberculosis," *J. Mater. Chem. B* (in press).
238. H.-Y. Wu*, G. Kabacaoğlu, E. Nazockdast, H.-C. Chang, M. J. Shelley, and D. J. Needleman, "Laser ablation and fluid flows reveal the mechanism behind spindle and centrosome positioning," *Nat. Phys.* **20**, 157–168 (2024).
237. N. Varkentina, Y. Avad, S. Y. Woo, F. Castioni, J.-D. Blazit, M. Tencé, H.-C. Chang, J. Chen, K. Watanabe, T. Taniguchi, M. Kociak, and L. H. G. Tizei*, "Excitation lifetime extracted from electron-photon (EELS-CL) nanosecond-scale temporal coincidences," *Appl. Phys. Lett.* **123**, 223502 (2023).
236. T.-I. Yang, Y.-Y. Hui, J.-I. Lo, Y.-W. Huang, Y.-Y. Lee, B.-M. Cheng*, and H.-C. Chang*, "Imaging extreme ultraviolet radiation using nanodiamonds with nitrogen-vacancy centers," *Nano Lett.* **23**, 9811–9816 (2023).
235. H.-H. Lin, C.-Y. Wang, F.-J. Hsieh, F.-Z. Liao, Y.-K. Su, M. D. Pham, C.-Y. Lee, H.-C. Chang*, and H.-H. Hsu*, "Nanodiamonds in oil emulsions elicit potent immune responses for effective vaccination and therapeutics," *Nanomedicine* **18**, 1045–1059 (2023).
234. H. Wen, D. Kordahl, I. Kuschnerous, P. Reineck, A. Macmillan, H.-C. Chang, C. Dwyer, and S. L. Y. Chang*, "Correlative fluorescence and transmission electron microscopy assisted by 3D machine learning reveals thin nanodiamonds fluoresce brighter," *ACS Nano* **17**, 16491–16500 (2023).
233. T.-N. Le, H.-Y. Chen, X. M. Lam, C.-C. Wang, and H.-C. Chang*, "Antibody-conjugated nanodiamonds as dual-functional immunosensors for *in vitro* diagnostics," *Anal. Chem.* **95**, 12080–12088 (2023).

232. C.-S. Huang, C.-H. Hsiao, Y.-C. Chang, C.-H. Chang, J.-C. Yang, J. L. Gutmann, H.-C. Chang, H.-M. Huang*, and S.-C. Hsieh*, “A novel endodontic approach in removing smear layer using nano and submicron diamonds with intracanal oscillation irrigation,” *Nanomaterials* **13**, 1646 (2023) (16pp).
231. V. Elakkat, E. Tessema, C.-H. Lin, X. Wang*, H.-C. Chang, Y.-N. Zheng, Y.-C. Huang, G. Gurumallappa, Z.-Y. Zhang, K. L. Chan, H. A. Rahayu, J. S. Francisco, and N. Lu*, “Unusual changes of C–H bond lengths in chiral zinc complexes induced by noncovalent interactions,” *Angew. Chem. Int. Ed.* **62**, e202215438 (2023) (8pp).
230. T.-I. Yang, T. Azuma, Y.-W. Huang, Y.-Y. Hui, C.-T. Chiang, and H.-C. Chang*, “Stimulated emission cross sections and temperature-dependent spectral shifts of neutral nitrogen-vacancy centers in diamonds,” *J. Chin. Chem. Soc.* **70**, 451–459 (2023).
229. T.-N. Le, W. W.-W. Hsiao*, Y.-Y. Cheng, C.-C. Lee, T.-T. Huynh, M. D. Pham, M. Chen, M.-W. Jen, H.-C. Chang*, and W.-H. Chiang*, “Spin-enhanced lateral flow immunoassay for high-sensitivity detection of nonstructural protein NS1 serotypes of dengue virus,” *Anal. Chem.* **94**, 17819–17826 (2022).
228. T.-I. Yang, Y.-W. Huang, P. Bista, C.-F. Ding, J. Chen, C.-T. Chiang*, and H.-C. Chang*, “Photoluminescence of nitrogen-vacancy centers by ultraviolet one- and two-photon excitation of fluorescent nanodiamonds,” *J. Phys. Chem. Lett.* **13**, 11280–11287 (2022).
227. W. W.-W. Hsiao*, N. Sharma, T.-N. Le, Y.-Y. Cheng, C.-C. Lee, D.-T. Vo, Y.-Y. Hui, H.-C. Chang, and W.-H. Chiang*, “Fluorescent nanodiamond-based spin-enhanced lateral flow immunoassay for detection of SARS-CoV-2 nucleocapsid protein and spike protein from different variants,” *Anal. Chim. Acta* **1230**, 340389 (2022) (8pp).
226. Y. Y. Hui, Y.-X. Tang, T. Azuma, H.-H. Lin, F.-Z. Liao, Q.-Y. Chen, J.-H. Kuo, Y.-L. Wang, and H.-C. Chang*, “Design and implementation of a low-cost portable reader for thermometric lateral flow immunoassay,” *J. Chin. Chem. Soc.* **69**, 1356–1365 (2022).
225. T. Azuma, Y. Y. Hui, O. Y. Chen, Y.-L. Wang, and H.-C. Chang*, “Thermometric lateral flow immunoassay with colored latex beads as reporters for COVID-19 testing,” *Sci. Rep.* **12**, 3905 (2022) (12pp).
224. A. A. Patil, M. J. N. Descanzo, J. B. A. Agcaoili, C.-K. Chiang, C.-L. Cheng, H.-C. Chang, and W.-P. Peng*, “Carboxylated/oxidized diamond nanoparticles for quantifying immunoglobulin G antibodies using mass spectrometry,” *ACS Appl. Nano Mater.* **4**, 8922–8936 (2021).
223. S. Meuret*, L. H.G. Tizei, F. Houdellier, Y. Auad, S. Weber, H.-C. Chang, M. Kociak and A. Arbouet*, “Time-resolved cathodoluminescence in an ultrafast transmission electron microscope,” *Appl. Phys. Lett.* **119**, 062106 (2021) (6pp).
222. J. Chen*, O. Y. Chen*, and H.-C. Chang*, “Relaxation of a dense ensemble of spins in diamond under a continuous microwave driving field,” *Sci. Rep.* **11**, 16278 (2021) (12pp).
221. T. T. Ho, V. T. Pham, T. T. Nguyen, T. V. Bao, V. T. Trinh, Q. M. Dang, H.-H. Lin, H. T. Bui, P. T. M. Nguyen, N. B. Pham, T. B. L. Thi, C. V. Phan, H.-C. Chang, W. W.-W. Hsiao, H. H. Chu*, and M. D. Pham*, “Effects of size and surface properties of nanodiamonds on the immunogenicity of recombinant H5 protein of A/H5N1 virus in mice,” *Nanomaterials* **11**, 1597 (2021).
220. Y. Y. Hui, O. Y. Chen, H.-H. Lin, Y.-K. Su, K. Chen, C.-Y. Wang, W. W.-W. Hsiao, and H.-C. Chang*, “Magnetically modulated fluorescence of nitrogen-vacancy centers in nanodiamonds for ultrasensitive biomedical analysis,” *Anal. Chem.* **93**, 7140–7147 (2021).
219. N. Prabhakar*, I. Belevich, M. Peurla, X. Heiligenstein, H.-C. Chang, C. Sahlgren, E. Jokitalo, and J. M. Rosenholm, “Cell volume (3D) correlative microscopy facilitated by intracellular fluorescent nanodiamonds as multi-modal probes,” *Nanomaterials* **11**, 14 (2021) (10pp).

218. S. Meuret, Y. Auad, L. Tizei, H.-C. Chang, F. Houdellier, M. Kociak, and A. Arbouet, "Time-resolved cathodoluminescence in a transmission electron microscope applied to NV centers in diamond," *Microsc. Microanal.* **26** (S2), 2022-2023 (2020).
217. D. Duan, V. K. Kavatamane, S. R. Arumugam, Y.-K. Tzeng, H.-C. Chang, and G. Balasubramanian*, "Tapered ultra-high NA optical fiber tip for nitrogen-vacancy ensembles based endoscope in a fluidic environment," *Appl. Phys. Lett.* **116**, 113701 (2020) (6pp).
216. H.-C. Lu*, J.-I. Lo, Y.-C. Peng, S.-L. Chou, B.-M. Cheng*, and H.-C. Chang*, "Nitrogen-vacancy centers in diamond for high-performance detection of vacuum ultraviolet, extreme ultraviolet and X-rays," *ACS Appl. Mater. Interfaces* **12**, 3847–3853 (2020).
215. S.-J. Kuo, S.-W. Chang, Y. Y. Hui, O. Y. Chen, Y.-W. Chen, C.-C. Lin, D. Wan, H.-L. Chen*, and H.-C. Chang*, "Fluorescent microdiamonds conjugated with hollow gold nanoparticles as photothermal fiducial markers in tissue," *J. Mater. Chem. C* **7**, 15197–15207 (2019).
214. B.-M. Chang, L. Pan, H.-H. Lin, and H.-C. Chang*, "Nanodiamond-supported silver nanoparticles as potent and safe antibacterial agents," *Sci. Rep.* **9**, 13164 (2019) (11pp).
213. Y. Xu, Y. Su, Y. Yu, Y. Y. Hui, J. Cheng, H.-C. Chang, Y. Zhang, Y. R. Shen, and C. Tian*, "Mapping dynamical magnetic responses of ultra-thin micro-size superconducting films using nitrogen-vacancy centers in diamond," *Nano Lett.* **19**, 5697–5702 (2019).
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