

**Contact Information:**

Phone: (602) 827-2051
Email: fzenhaus@arizona.edu



Frederic Zenhausern, Ph.D., MBA

Director of Center for Applied NanoBioscience and Medicine (ANBM) at the College of Medicine - Phoenix.
Director of Biomedical Engineering (BME) at the University of Arizona College of Medicine - Phoenix
Endowed Chair Professor of Basic Medical Sciences at the College of Medicine – Phoenix
Professor of Radiation Oncology and Biomedical Engineering at the University of Arizona

Background

Dr. Zenhausern is the founding Director of the Center for Applied NanoBioscience and Medicine (ANBM) at The University of Arizona (UA), College of Medicine - Phoenix. He is also the Director of Biomedical Engineering (BME) and Endowed Chair Professor of Basic Medical Sciences (BMS) at the College of Medicine – Phoenix. Prior to joining The University of Arizona, Prof. Zenhausern was Director of the Center for Applied NanoBioscience at the Arizona State University's (ASU) Biodesign Institute. While at Arizona State University, he was co-founder and director for the first phase of the Flexible Display Center at ASUMacroTechnology Works. Dr. Zenhausern was also tenured professor with both the Electrical Engineering Department and the School of Materials at ASU's Ira A. Fulton School of Engineering. Dr. Zenhausern is a Senior Investigator and Associate Director of Molecular Diagnostics and Target Validation Division at the Translational Genomics Research Institute (TGen).

Another of Dr. Zenhausern's responsibilities is leading the Laboratory for Research in Personalized Medicine at Scottsdale Healthcare Research Institute. Together with Dr. Jeffrey Trent, Dr. Zenhausern co-founded Nanobiomics Inc. which merged with the Molecular Profiling Institute that was acquired by Caris Diagnostics in 2008. Dr. Zenhausern also serves on several corporate scientific boards and international consortia in life sciences.

Dr. Zenhausern received his B.S. in biochemistry from the University of Geneva, a M.B.A. in finance from Rutgers University and his Doctorate Es Science in Applied Physics from the department of Condensed Physics Matter at the University of Geneva in Switzerland. Dr. Zenhausern has co-authored more than 70 scientific publications and is named on more than a dozen issued U.S. patents. Dr. Zenhausern has held several corporate research position, including: Visiting Scientist (IBM T.J. Watson Research Center, NY), Head of Physical Measurements Group (Firmenich Inc., NJ), Vice President Advanced Technology (Alpha-MOS America, Inc., NJ), and Manager of Microdevice Physics (Motorola Labs, AZ).

Research

Dr. Zenhausern applies interdisciplinary science approaches to medicine that are aimed at early diagnostics of human diseases, in particular, cancer, infectious and cardiovascular diseases. His team is developing platform technologies to translate molecular analysis into clinical tools through large scale prototyping with compliant regulation for future commercialization, and adoption of novel technologies for point-of-care applications. Nanobioscience enables understanding of biological interactions at multiple length scales for validating emerging drug/biomarkers development. Early molecular profiling and target identification in tumor microenvironment combined with physical science metrology open new approaches for tailoring treatments and personalizing medicine. Innovative platform technologies include gene expression based biosimetry for radio-oncology and imaging, rapid DNA testing for early stage detection of bacterial infections, as well as, forensic DNA fingerprinting for human identification or other public health countermeasures. Exploratory research developments within the center include single cell manipulation, volatile molecule profiling as a diagnostic, nanocomposite materials for biospecimen collection and preservation, and alternative bioenergy.

Selected Publications

Ashlee F. Harris, Jerome Lacombe, Sumedha Liyanage, Margaret Y. Han, Emily Wallace, Sophia Karsunky, Nouredine Abidi and Frederic Zenhausern, Supercritical carbon dioxide decellularization of plant material to generate 3D biocompatible scaffolds, *Nature Scientific Reports*, (2021) 11:3643 | <https://doi.org/10.1038/s41598-021-83250-9>

Devasier Bennet, Ashlee F. Harris, Jerome Lacombe, Carla Brooks, Nina Bionda, Aaron D. Strickland, Tony Eisenhut and Frederic Zenhausern, Evaluation of supercritical CO₂ sterilization efficacy for sanitizing personal protective equipment from the coronavirus SARS-CoV-2, *Science of the Total Environment*, (2021), 780, <https://doi.org/10.1016/j.scitotenv.2021.146519>

Devasier Bennet, Tuan Vo-Dinh, Frederic Zenhausern, Current and emerging opportunities in biological medium-based computing and digital data storage, *Nano Select*, 07 November (2021) <https://doi.org/10.1002/nano.202100275>

J. Yang, M. Kidd, A. R. Nordquist, S. D. Smith, C. Hurth, I. M. Modlin, F. Zenhausern, A Sensitive, Portable Microfluidic Device for SARS-CoV-2 Detection from Self-Collected Saliva, *Inf. Dis. Rep.* (2021), 13, 1061–1077. <https://doi.org/10.3390/idr130400975>

Jasmine Pramila Devadhasan, Jian Gu, Peng Chen, Stanley Smith, Baiju Thomas, Marcellene Gates-Hollingsworth, Derrick Hau, Sujata Pandit, David AuCoin, and Frederic Zenhausern, Critical Comparison between Large and Mini Vertical Flow Immunoassay Platforms for *Yersinia Pestis* Detection, *Analytical Chemistry*, 93,

27, 9337–9344, May 14, 2021, <https://doi.org/10.1021/acs.analchem.0c052786>

Jian Gu, Brett Duane, Mikhail Repin, David J. Brenner and Frederic Zenhausern, Transportation container for pre processing cytogenetic assays in radiation accidents, (2021) 11:10398, <https://doi.org/10.1038/s41598-021-89832-x7>

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Harris, A.F.; Lacombe, J.; Zenhausern, F. The Emerging Role of Decellularized Plant-Based Scaffolds as a New Biomaterial. *Int. J. Mol. Sci.* (2021), 22, 12347. <https://doi.org/10.3390/ijms2222123479>

Patrick Ostheim, Sally A. Amundson, Christophe Badie, Dimitry Bazyka, Angela C. Evans, Shanaz A. Gandhi, Maria Gomolka, Milagrosa López Riego, Peter K. Rogan, Robert Terbrueggen, Gayle E. Woloschak, Frederic Zenhausern, Hanns L. Kaatsch, Simone Schüle, Reinhard Ullmann, Matthias Port & Michael Abend, (2021), Gene Expression for Biodosimetry and Effect Prediction Purposes: Promises, Pitfalls and Future Directions - Key Session ConRad 2021, *International Journal of Radiation Biology*, <https://www.tandfonline.com/action/showCitFormats?doi=10.1080/09553002.2021.1987571>

Progress in Molecular Biology and Translational Science, Micro/nanofluidics and lab-on-chip based emerging technologies for biomedical and translational research applications – Part B, volume 187, edited by A. Pandya and V. Singh, Elsevier, ISBN: 978-0-323-85303-3, (2022); Chapter 3, Jerome Lacombe, Maria Soldevila and Frederic Zenhausern, From organ-on-chip to body-on-chip: The next generation of microfluidics platforms for in vitro drug efficacy and toxicity testing.