BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2.
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NAME	POSITION TITLE
Yung Chang, MD, PhD	Professor, School of Life Sciences
eRA COMMONS USER NAME (credential, e.g., agency login) YUNGCHANG	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
Beijing Medical University, Beijing, China	M.D.	1983	Medicine
U. Iowa, Iowa City, IA	Ph.D.	1988	Immunology

B. Positions and Honors.

Positions and Employment

1988-1991 Post-Doc. Fellow, Biochemistry, Boston University, MA (mentor: G. Sonenshein)
1991-1995 Post-Doc. Associate, Fox Chase Cancer Center, PA (Mentor: M. Bosma)
1996-2003 Assistant Professor, Dept of Microbiology, Arizona State University
1997-2001 Consultant to Motorola Bioscience Division
2003-2004 Associate Professor, Dept of Microbiology, Arizona State University
2004-2005 Associate Professor, School of Life Sceinces, Arizona State University
2005-2012 Associate Professor, School of Life Sceinces, Center for Infectious Diseases and Vaccinology, Arizona State University
2012-present Professor, School of Life Sceinces, Center for Infectious Diseases and Vaccinology, Arizona State University

Other experience and Professional Memberships

1996-2002 Member, American Association of Immunology
2011-present Member, American Association for Cancer Research
2001-present Ad hoc reviewer for American Federation for Aging Research
2001-present Member (ad hoc) of several study sections for NIH and NSF

Research Activity

- Lymphocyte Development, Lymphoid Malignancy and Vaccine development
  - V(D)J recombination process: structure, function and evolution perspectives
  - Inducible pre-B cell leukemia model: induced differentiation *vs* malignant transformation
  - Modulation of innate and adaptive immune responses
- Newly Established Interdisciplinary Research Projects
  - Development of fluorescence-based detection platform to monitor V(D)J recombination reaction in real time
  - Exploration of multivalent and multi-specific aptamer-DNA scaffolds for cancer therapy
  - Construction of tunable DNA-vaccines against cancer, infectious agents and abusive drugs

C. PUBLICATIONS (2007-Present)

1. Liu., X., Y. Xu, T. Yu, C. Clifford, Y. Liu, H. Yan* & **Y. Chang***. 2012. A DNA nanostructure platform for directed assembly of synthetic vaccines. *Nano Letters* 12: 4254-4259.
2. Wang, J., X. Zhu, X. Y. Chen* and **Y. Chang*.** 2012. The application of embryonic and adult zebrafish for assessing nanotoxicology. *Methods Mol. Biol.* 2012 926: 317-329.

3. Wang, G., K. Dhar, P. C. Swanson, M. Levitus* & **Y. Chang*.** 2012**.** Real time monitoring of RAG-catalyzed DNA cleavage unveils dynamic changes in coding end association with the post-cleavage complex. *Nucl. Acid Res.* 40:6082-6093.
4. Liu, X., H. Yan, Y. Liu* & **Y. Chang*.** 2011. Targeted Cell-Cell Interactions by DNA Nanoscaffold-Templated Multivalent Bi-specific Aptamers. *Small.* 7:1673-1682.
5. Wang, J, X. Zhu, X. Zhang, Z. Zhao, H. Liu, R. George, J. Wilson-Rawls. **Y. Chang*** and Y. Chen*. 2011. Are TiO2 nanoparticles safe? Disruption of zebrafish (*Danio reior*) reproduction upon chronic exposure to low concentrations of TiO2 nanoparticles. *Chemosphere.* 83:461-467.
6. Zhu, X., **Y. Chang*** & Y. Chen. 2010. Toxicity and bioaccumulation of TiO2 nanoparticle aggregates in Daphnia magna. *Chemosphere.* 78:209-215.
7. Zhu, X, J. Wang, Y*. Zhang, **Y. Chang*** & Y. Chen*. 2010. Trophic transfer of TiO_2 nanoparticles from Daphina to zebrafish in a simplified freshwater food chain*. Chemosphere*. 79: 928-933.
8. Zhu, X, J. Wang, J.. Zhang, **Y. Chang*** & Y. Chen*. 2009. Impact of ZnO nanoparticle aggregates on the embryonic development of Zebrafish (*Danio rerio*). *Nanotechology*. 20: 195103 (1-9).
9. Franco, D. & **Y. Chang***. 2009. Accessibility of Chromosomal Recombination Breaks in Nuclei of Wild-type and DNA-PKcs-Deficient cells. *DNA Repair*. 8: 813-821.
10. Hahn, K. L., B. Beres, M. Rowton, M. Skinner, **Y. Chang**, A. Rawls, J. Wilson-Rawls. 2009. A deficiency of Lunatic fringe is associated with defects of the rete testis. *Reproduction.* 137: 79-93.
11. Pavlicek, J., Y. Lyubchenko and **Y. Chang***. 2008. Revelation of RAG-induced DNA bending by atomic force microscopy. *Biochemistry*. 47:11204-11.
12. Ke, Y., S. Lindsay, **Y. Chang,** Y. Liu and H. Yan. 2008. Self-assembled Water-soluble Nanoarrays for Label Free RNA Hybridization Assays. *Science* 319:180-183.
13. Jentarra, GM, M.C. Heck, J.W. Youn, K. Kibler, J.O. Langland, C. R. Baskin, O. Ananieva[a], **Y**. **Chang** & Jacobs BL. 2008. Vaccinia viruses with mutations in the E3L gene as potential replication-competent, attenuated vaccines: scarification vaccination. *Vaccine.* 26:2860-72.
14. Zhong, H., Z. Li, S. Lin and **Y. Chang***. 2007. Initiation of V(D)J recombination in zebrafish (Danio rerio) ovaries. *Mol. Immunol*. 44:1795-1803.
15. Li, Z. , **Y. Chang*.** 2007. V(D)J recombination in zebrafish: normal joining products with accumulation of unresolved coding ends and deleted signal ends. *Mol. Immunol*. 44:1804-1813.

**: corresponding author*

D. RESEARCH SUPPORT

Current Support

NIDA R01DA035554 ($3.3 millions) PI: Chang 04/01/13-03/31/2016

Rational design and targeted selection of effective DNA-scaffolded nicotine vaccines

In this application, we propose to develop a new technology to rationally design and construct nicotine vaccines. Specifically, we will explore programmable DNA-nanostructures to assemble nicotine and other immunogenic components to enhance the immunogenicity and efficacy of the vaccines.

Role: PI

NIDA R21DA030045 ($361,7317) PI: Chang 4/1/11-3/31/14

Tunable Nicotine DNA-Nanovaccines

We propose to develop novel DNA nanovaccines against nicotine. Through rationale design and stepwise screenings, we aim to create effective nicotine vaccines to treat nicotine-dependence.

Completed Research Support

NIH R21 CA141021 ($352,000) PI: Chang 5/1/10 – 4/30/13
Tunable DNA-nanostructure to induce NK-mediated killing of tumor cells
A tumor-killing DNA-nanostructure will be developed, in which multimeric cell recognition aptamers will be assembled onto tunable and programmable DNA-nanoscaffolds to engage immune cells to attack tumor cells.

ASU-MCA ($40,000) PI: Chang 1/1/12 – 12/31/12
Anti-tumor immunomodulating DNA-nanostructures
To create DNA-nanoscaffolded tumor vaccines to induce tumor immunity against breast cancer cells in a mouse model.

ASU-MCA 08029754 ($10,000 to ASU) PI: Chang (MCA) 1/1/10 – 12/31/10
Overcoming Drug Resistance in Breast Cancer Stem Cells (BCSC)
To develop effective therapeutic approach to target multi-drug resistant breast cancer cells by genetic manipulations to hyper-sensitize these cancer cells.
Role: co-PI, contributing to the characterization of tumor stem cells

CDMRP (DOD) BC085523 ($106,000) PI: Chang 10/15/09 –10/14/10
Multi-Specific aptamer-nanoscaffolds to induce aptamer-dependent cellular cytotoxicity (ApDCC) against breast cancer cells
The ultimate goal is to create controllable nanoscale super-complexes to engage immune cells and molecules, and mobilize multiple signaling pathways and effector mechanisms to maximize the killing of tumor cells.

NIH ($380,000) PI: Chen 7/20/08-6/1/2010
Development of a Fish Model for Dyskeratosis Congenita and Cancer Research
A medeka fish model is developed to study human genetic disease, Dyskeratosis Congenita and cancer.
Role: co-PI, providing guidance in medeka immune system characterization

EPA RD83332701 ($403,861) PI: Chen 5/1/07– 4/31/10
Methodologies Development for Manufactured Nanomaterial Bioaccumulation Test
We attempt to develop methodologies to assess the potential risks of bioaccumulation of manufactured nanomaterials in aquatic organisms. So that we can understand their potential impacts and avoid serious environmental consequences.
Role: co-PI, leading the effort in characterizing environmental impact of several metal oxide nanoparticles in aquatic organisms.

A NIH 2RO1CA73857 ($1,530,612) PI: Chang 1/1/03 – 12/31/09
Effect of V(D)J recombination on scid B cell development
Investigate how scid lymphocytes resolve recombination intermediates and determine how end resolution affects scid cells in vitro.