

BIOGRAPHICAL SKETCH

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NAME Yung Chang, MD, PhD		POSITION TITLE Professor	
eRA COMMONS USER NAME (credential, e.g., agency login) YUNGCHANG			
EDUCATION/TRAINING (<i>Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.</i>)			
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

A. PROFESSIONAL EXPERIENCE

Professor	School of Life Sciences, Arizona State University, AZ	2012-present
Associate Professor	School of Life Sciences, Arizona State University, AZ	2003-2012
Associate Professor	Microbiology, Arizona State University, AZ	2002-2003
Assistant Professor	Microbiology, Arizona State University, AZ	1996-2002
Post-Doc. Assoc.	The Institute for Cancer Research, Fox Chase Cancer Center, PA Mentor: Melvin Bosma <i>Project: Molecular elucidation of Ig-transgene on scid B cell development</i>	1991-1995
Post-Doc. Fellow	Biochemistry, Boston University, MA, Mentor: Gail Sonenshein <i>Project: Transcriptional regulation of c-myc expression during cytokine induction</i>	1988-1990
Graduate Student	Microbiology/Pathology, University of Iowa Mentor: Richard G. Lynch <i>PhD Thesis: In vivo regulation of MOPC-31 plasmacytoma by monoclonal anti-idiotypic antibody</i>	1983-1988

B. 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

Most relevant to the current application

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 (accepted for publication)*.
2. Wang, J., X. Zhu, X. Y. Chen* and **Y. Chang***. 2012. The application of embryonic and adult zebrafish for

assessing nanotoxicology. *In Nanotoxicity: Methods and Protocols*. Editor: J. J. Reineke. Human Press 2012 (In Press).

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.* (in press).
 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 TiO₂ nanoparticles from *Daphnia* 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*). *Nanotechnology*. 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.
 16. Wang, Q., Y. Xu, X. Zhao, **Y. Chang**, Y. Liu, L. Jiang, J. Sharma, D. K. Seo & H. Yan. 2007. A facile one-step in situ functionalization of quantum dots with preserved photoluminescence for bioconjugation. *J. Am. Chem. Soc.*, 129:6380-6381.
 17. Jacobsen, E., O. Ananieva, M. L. Brown and **Y. Chang***. 2006. Growth, differentiation and malignant transformation of pre-B cells mediated by inducible activation of v-Abl oncogene. *J. Immunol*. 176:6831-6838.
 18. Bogani, F. E. McConnell, L. Joshi, **Y. Chang**, G. Ghirlanda. 2006. A designed glycoprotein analogue of Gc-MAF exhibits native-like phagocytic activity. *J. Am. Chem. Soc.* 128:7142-7143.
 19. Chen, Y., T. Fu. T. Tao, J. Yang, **Y. Chang**, M. Wang, L. Kim, L. Qu, J. Cassady, R. Scalzo & X. Wang. 2005. Macrophage activating effects of new alkamides from the roots of Echinacea species. *J. Nat. Prod*. 68: 773-776.
 20. Jacobson, E., T. Beach, Y. Shen, R. Li, & **Y. Chang***. 2004. Reduction of the Mre11 DNA repair complex in Alzheimer's Diseases. *Mol. Brain Res*. 128:1-7.
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21. Pettit, G. R., H. Hoffman, H. D. L Herald, P. M. Blumberg, E. Hamel, J. M. Schmidt, **Y. Chang**, R. K. Pettit, N. E. Lewin and L. V. Pearce. 2004. Antineoplastic agents. 499. Synthesis of hystatin 2 and related 1H-benzo[de][1,6]-naphthyridinium salts from aaptamine. *J. Med. Chem.* 47: 1775-1782.
22. Martina, C., A. Bell, J. Wayne^a and **Y. Chang***. 2003. In vivo ligation of CD3 on neonatal scid thymocytes blocks g-irradiation-induced TCRb rearrangements and thymic lymphomagenesis. *Immunol. Letter.* 85: 279-286.
23. Brown, M. L. , D. Franco, A. Bürkel and **Y. Chang***. 2002. Role of PARP in DNA- PK independent recombination. *Proc. Natl. Acad. Sci. USA* 99:4532-4537.
24. Perkins, E. J., A. Nair, D. O. Cowley, T. Van Dyke, **Y. Chang** and D. A. Ramsden. 2002. Sensing of intermediates in V(D)J recombination by ATM. *Genes & Dev.* 16:159-164.
25. Middlebrook AJ, C. Martina, **Y. Chang**, R. J. Lukas & D. DeLuca. 2002. Effects of nicotine exposure on T cell development in fetal thymus organ culture: arrest of T cell maturation. *J Immunol.* 169:2915-2924.
26. Brown, M. L and **Y. Chang***. 2000. Metabolism of recombination coding ends in scid cells. *J. Immunol.* 164:4135-4142.
27. Lew, S., D. Franco and **Y. Chang***. 2000. Activation of V(D)J recombination induces the formation of interlocus joints and hybrid joints in scid pre-B cell lines. *Mol. Cell. Biol.* 20(19):7170-7.
28. Brown, M. L., S. Lew and **Y. Chang***. 2000. The scid recombination-inducible cell line: a model to study DNA-PK-independent V(D)J recombination. *Immunol. Letter.* 75: 21.
29. **Chang, Y.*** and Brown, M. L. 1999. Formation of coding joints in V(D)J recombination-inducible scid pre-B cell lines. *Proc. Natl. Acad. Sci. USA* 96: 191-196.
30. **Chang, Y.**, M. J. Bosma and G. C. Bosma. 1999. Extended duration of DH-JH rearrangement in immunoglobulin heavy chain transgenic mice: implications for regulation of allelic exclusion. *J. Exp. Med.* 189: 1295-1305.
31. Bosma, G.C., **Y. Chang**, and M. J. Bosma, 1999. Differential effect of an immunoglobulin m transgene on development of pre-B cells in fetal and adult scid mice. *Proc. Natl. Acad. Sci. USA* 96:11952-11957.
32. **Chang, Y.** and M. J. Bosma. 1997. Immunoglobulin transgenic scid mice: requirements for the rescue of scid B cell differentiation. *Int. Immunol.* 9:373-380.
33. **Chang, Y.**, G. C. Bosma and M. J. Bosma. 1995. Development of B cells in scid mice with immunoglobulin transgenes: Implications for the control of VDJ recombination. *Immunity* 2: 607-616. [P]
34. **Chang, Y.**, D. B. Spicer, and G. E. Sonenshein. 1991. Effects of IL-3 on promoter usage, attenuation and antisense transcription of the c-myc oncogene in the IL-3-dependent Ba/F3 early pre-B cell line. *Oncogene* 6: 1979-1982.
35. Lynch, R. G., **Y. Chang**, A. Mathur, M. G. Robinson and L. Vaickus. 1988. Therapeutic implications of immunoregulatory circuits in malignant monoclonal gammopathies. *Monoclonal Gammopathies II: Clinical significance and basic mechanisms. Topics in Aging Research in Europe* 5: 69-17.
36. Urnovitz, H. B., **Y. Chang**, M. Scott, J. Fleischman and R. G. Lynch. 1988. IgA: IgM and IgA: IgA hybrid hybridomas secrete heteropolymeric immunoglobulins that are polyvalent and bispecific. *J. Immunol.* 140: 558-563.

*: corresponding author

D. RESEARCH SUPPORT

Current Support

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.

NIDA R21DA030045 (\$361,7317) PI: Chang 4/1/11-3/31/13

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.

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.

NIH R25 (\$569,048) PI: Newfeld 03/1/12-02/28/16

Initiative for Maximizing Student Diversity (IMSD) at ASU

The proposed IMSD at ASU program will have both an undergraduate and a graduate component. Both are designed to increase the recruitment, retention, and success of students from groups underrepresented in the life sciences in pathways leading to careers in research.

Role: Co-PI, to direct the graduate program of the IMSD at ASU

Completed Research Support

NIH/NCRR PI: Duch 4/1/11-3/31/12

Acquisition of a Leica TCS SP5 Laser Scanning Confocal Microscope

This grant aims to obtain a high-resolution fluorescence microscopy system.

Role: Co-PI.

NIH/NIAID U01 A1066326 (\$673,321) PI: Jacobs 7/10/05 – 6/30/11

Disabling Vaccinia Ifnr: A New Smallpox Vaccine

The proposed studies intend to develop an effective and safer vaccine to protect against Smallpox.

Role: Co-PI.

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 medaka fish model is developed to study human genetic disease, Dyskeratosis Congenita and cancer.

Role: co-PI, providing guidance in medaka 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.

ASU-MCA 08029754(\$40,000) PI: Chang 1/1/08 – 12/31/09

Novel Cellular Model to Study Chromosomal Abnormality

To apply the state-of-the art technology to conduct chromosomal profiling to search for chromosomal abnormalities and identify genes that are targeted for alteration during active recombination.

VA-Hayden Center (\$9,500) PI: Chang 09/01/07-8/31/09

Surface Phenotyping Of endothelial Progenitors Isolated From PBL.

This project examines the frequency and differentiation potentials of vascular progenitor cells isolated from diabetic patients and control individuals.

0541835 NSF (\$500,000) PI: Petuskey 02/15/06-01/31/09

Purchase of an Instrument for Ultrafast, Multidimensional Fluorescence Detection and Imaging

This state-of-the art instrument allows multi-fluorochrome detection of biological process in cells and animals
Role: Co-PI

NIH/NIDA (\$349,928) PI: Deluca 4/1/2004-3/31/2008

Nicotine Regulation Of T Cell Development

This grant focuses on the effect of nicotine on human T cell development and formation of T cell repertoire.
Role: PI (subcontract from University of Arizona), leading the characterization of early T cell differentiation gene expression affected by the nicotine exposure.

030789 Gaia Herbs, Inc (\$151,183). PI: Chang 01/02/03-12/31/05

Evaluation of Echinacea: its Toxicity and Immune Modulation

This grant intends to evaluate activities of herbal extracts on both innate and adaptive immune responses.

1S10RR019034 NCRR (\$416,850) PI: Chang 04/01/04-03/31/05

The BD FACSAria, a new flow cytometer sorter

This proposal is a joined effort to obtain a newly developed FACSAria Cell Sorter to conduct a variety of biomedical studies at ASU.
