

October 28, 2008

CURRICULUM VITAE

Name: Naoya Yuhki, Ph.D.

Citizenship and Place of Birth: Japan, Osaka, Japan

Current Title:

Naoya Yuhki, Ph.D.  
Senior Staff Scientist  
Laboratory of Genomic Diversity  
National Cancer Institute at Frederick

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Education:

|                |   |
|----------------|---|
| 1981           | D.D.S., Hokkaido University, Japan                    |
| 1985           | Ph.D. (Molecular Biology), Hokkaido University, Japan |
| 2006 - Present | Montgomery College, Information Technology Institute  |

Introduction for Computer Programming (VB.NET)  
C++ level I and level II  
Perl Programming Introduction  
Computer Programming for Bioinformatics level I and level II (Perl)  
PHP level I and level II (MySQL & PHP)  
Linux/Unix – Level I & II  
Linux/Unix – Advanced Management  
JavaScript  
Cascading Style Sheets

|      |   |
|------|---|
| 2006 | National Center for Biotechnology Information: Power scripting for EUtils |
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| 2007 | The Institute for Genome Research (TIGR): Annotation for Eukaryotic Genome |
| 2007 | Cold Spring Harbor Laboratory: Programming for Biology                     |
| 2008 | Genomatix Training Course  |
| 2008 | MatLab Training Course   |

#### MEMBERSHIPS IN NIH

- Faculty Memberships: Immunology, Systems Biology

#### CURRENT RESEARCH TOPICS AND INTERESTS

- Head of LGD sequencing core. Run ABI3730XL and Biomek Fx to conduct highly successful HLA typing system, DNA Polymorphism detection and BAC/Fosmid DNA sequences in LGD
- Algorithms for new sequencing base calling and assembly
- Cancer Genomics/NCI60/caBIG/Hapmap3 Analysis with Bioconductor, Perl, R, C, PLINK
- Genomes on Rails Development to process peta- and exabytes size data in DBMS
- Antiretroviral APOBEC3 gene complex read-through alternative splicing and hyper mutations against FIV and FeLV
- Gene conversion between CCR2 and CCR5 chemokine receptor genes for dimerization mechanism
- Genome annotation of Feline Genome and SNP analysis in MHC region
- Bioinformatics and Computational Biology using Perl, Ruby, and R, Bioconductor, Agile Programmings for Large Data Sets
- Web Development with Ruby on Rails, Ajax, JavaScript, CSS, Testing and Production, Git deployment
- Computer Programmings for Biology with Open Sources, Perl, BioPerl, R, C, Ruby on Rails, Python, Web2.0 programmings, C++, NET, PHP, Unix/Linux, SQL, Statistics, Mathematics

#### BRIEF CHRONOLOGY OF EMPLOYMENT:

|           |   |
|-----------|---|
| 1981-1985 | Department of Oral Surgery, School of Dentistry, Hokkaido University, Sapporo, Japan  |
| 1985-1988 | Visiting Fellow, Laboratory of Viral Carcinogenesis, National Cancer Institute, National Institutes of Health, Frederick, MD    |
| 1988-1991 | Visiting Associate, Laboratory of Viral Carcinogenesis, National Cancer Institute, National Institutes of Health, Frederick, MD |
| 1991-1998 | Visiting Scientist, Laboratory of Genomic Diversity, National Cancer Institute, National Institutes of Health, Frederick, MD    |

1998-present      Staff Scientist (VP), Laboratory of Genomic Diversity, National Cancer Institute, National Institutes of Health, Frederick, MD

#### SOCIETIES:

The Japanese Association of Immunology  
The Japanese Pathological Society  
The Japanese Association of Cancer  
Japan Society for Cancer Therapy  
Japan Society for Cell Biology  
The Molecular Biology Society of Japan

#### HONORS AND OTHER SPECIAL SCIENTIFIC RECOGNITION:

NIH Postdoctoral Fellowship, 1985-1988  
Faculty Member, NOAHS (New Opportunities in Animal Health Sciences) Conservation and Research Center, National Zoological Park, Smithsonian Institution, National Cancer Institute 1995-present  
Faculty Member, Conservation Genetics Course, NOAHS Conservation and Research Center, National Zoological Park, Smithsonian Institution, National Cancer Institute, 1995-present

#### COMMITTEES AND BOARDS:

Committee Member for 6th International Feline Retrovirus Research Symposium: Future Directions for FIV/FeLV/Cat Models of AIDS and Leukemia, December 2-5, 2002  
Committee Member for 8<sup>th</sup> International Feline Retrovirus Research Symposium: Cat Genomics and Infectious Diseases in the 21<sup>st</sup> Century, October 8-11, 2006

#### MENTORSHIPS:

|               |  |
|---------------|--|
| 1994 -present | Mentorships for Werner-Kirsten student internship program NCI at Frederick |
| 1994          | Dr. Ryuichi Masuda, Forgarty International Fellow                          |
| 1994          | Jose Lopez, Ph.D. James Madison University                                 |
| 1994          | Eric Brown, M.S. Hood College  |
| 1997          | Joelle Wentzel, M.S. Hood College  |
| 2002-2004     | Yasuko Ishida, Ph.D. Japan Society of Science Promotion (JSPS) Fellow      |
| 2007 Jun-Aug  | Summer Course of Computer Programming for CRTA and SIP students            |

#### RESEARCH INTERESTS:

Molecular Biology/Bioinformatics/Computational Biology/Molecular Genetics/Genome Function/Molecular Immunology

#### SYMPOSIUM/CONGRESS INVITED AS A SPEAKER (LAST 5YEARS):

1. 6th International Feline Retrovirus Research Symposium: Future Directions for FIV/FeLV/Cat Models of AIDS and Leukemia, Jacksonville, FL. December 2-5, 2002
2. 2nd International Meeting for Advances in Canine and Feline Genomics, St. Louis, 2002
3. 3rd International Meeting for Advances in Canine and Feline Genomics, Utrecht, The Neatherlands, 2004
4. 8th International Congress of Mammalogy, Sapporo Japan, 2005
5. 2nd International Symposium: Ryukyu University 21 st century COE Program, Wild Cats: Ecological Diversity and Conservation Strategy, Okinawa, Japan, 2005
6. 1st International Symposium of MHC Evolution, Wako, Japan, 2005
7. 4th International Meeting for Advances in Canine and Feline Genomics, Davis, CA 2006
8. 8th International Feline Retrovirus Research Symposium: Cat Genomics and Infectious Diseases in the 21 st Century, Washington DC, 2006
9. 3rd Symposium of MHC Evolution and Application for Infectious Diseases, Tsukuba, Japan, 2007

## BIBLIOGRAPHY

1. Mizushima, Y., Yuhki, N., Hosokawa, M. and Kobayashi, H. 1982. Diminution of cyclophosphamide-induced suppression of antitumor immunity by an immunomodulator PS-K and combined therapeutic effects of PS-K and cyclophosphamide on transplanted tumor in rats. *Cancer Res.* 42: 5176-5180.
2. Mizushima, Y., Koga, Y., Yuhki, N. and Kobayashi, H. 1983. The therapeutic effect of the antileukemia drug bufulfan as an immunomodulator on transplanted fibrosarcoma KMT-17 in WKA rats. *Gann* 74: 162-168.
3. Yuhki, N., Oikawa, T., Kuzumaki, N., Takeichi, N. and Kobayashi, H. 1983. Differentiating activity of ouabain resistant clones isolated from a rat myeloid leukemia cell line. *Cell Struct. Funct.* 8: 437-438.
4. Yuhki, N., Oikawa, T., Kuzumaki, N. and Kobayashi, H. 1984. Q-banded karyotype of differentiating myelomonocytic leukemia cell line in the rat. *Chromo. Infor. Serv.* 34: 15-16.
5. Oikawa, T., Yuhki, N., Yamada, T. and Kuzumaki, N. 1984. C-band patterns of chromosomes in two substrains of NZB mice. *Chromo. Infor. Serv.* 36: 26-28.
6. Oikawa, T., Katoh, H., Shoji, Y., Esaki, K., Ishikawa, M., Yuhki, N., Kuzumaki, N., Tateno, M. and Yoshiki, T. 1985. Genetic differences between two substrains of NZB mice. *J. Immunogenet.* 12: 71-73.
7. Yuhki, N., Hamada, J., Kuzumaki, N., Takeichi, N. and Kobayashi, H. 1986. Metastatic ability and expression of c-fos oncogene in cell clones of a spontaneous rat mammary tumor. *Gann* 77: 9-12.
8. Fujii, Y., Yuhki, N., Takeichi, N., Kobayashi, H. and Miyazaki, T. 1987. Differentiation therapy of a myelomonocytic leukemia (c-WRT-7) in rats by injection of lipopolysaccharide and daunomycin. *Cancer Res.* 47: 1668-1673.
9. Yuhki, N., and O'Brien, S.J. 1988. Molecular characterization and gene mapping of class I and class II MHC genes of the domestic cat. *Immunogenetics* 27: 414-425.
10. Oikawa, T., Yuhki, N., Kondoh, N., Abe, K., Yuhki, N., Ogiso, Y. and Kuzumaki, N. 1988. C-myc expression and transformed phenotypes in hybrid clones between mouse plasmacytoma S194 cells and normal spleen cells or fibroblasts. *Int. J. Cancer* 42: 435-440.
11. Yoshimura, T., Yuhki, N., Moore, S.K., Appella, E., Lerman, M.I. and Leonard, E.J. 1989. Human monocyte chemoattractant protein-1 (MCP-1): full-length cDNA cloning, expression in mitogen-stimulated blood mononuclear leukocytes, and sequence similarity, competence gene JE. *FEBS Lett.* 244: 487-493.

12. Yuhki, N ., Heidecker, G.F. and O'Brien, S.J. 1989. Characterization of major histocompatibility complex cDNA clones in the domestic cat: Diversity and evolution of MHC class I genes. *J. Immunol.* 142: 3676-3682.
13. Yuhki, N ., and O'Brien, S.J. 1990. DNA variation of the mammalian major histocompatibility complex reflects genomic diversity and population history. *Proc. Natl. Acad. Sci. USA* 87: 836-840.
14. Cofano, F., Moore, S.K., Tanaka, S., Yuhki, N ., Landolfo, S. and Apella, E. 1990. Affinity purification, peptide analysis, and cDNA sequence of the mouse interferon receptor. *J. Biol. Chem.* 265: 4064-4071.
15. Yuhki, N ., and O'Brien, S.J. 1990. DNA recombination and natural selection pressure sustains genetic sequence diversity of the feline MHC class I genes. *J. Exp. Med.* 172: 621-630.
16. O'Brien, S., Roelke, M., Yuhki, N ., Richards, K., Johnson, W., Franklin, W., Anderson, A., Bass, O., Belden, R. and Martenson, J. 1990. Genetic introgression within the Florida panther *felis concolor coryi*. *National Geographic Research* 6: 485-494.
17. Yoshimura, T. and Yuhki, N . 1990. Neutrophil attractant/activation protein-1 and monocyte chemoattractant protein-1 in rabbit: cDNA cloning and their expression in spleen cells. *J. Immunol.* 146: 3483-3488.
18. Masuda, R., Yuhki, N ., and O'Brien, S.J. 1991. Molecular cloning, chromosomal assignment, nucleotide sequence of the feline homeobox HOX3A. *Genomics* 11: 1007-1013.
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20. Janczewski, D., Yuhki, N ., Gilbert, D.A., Jefferson, G. and O'Brien, S.J. 1992. Molecular phylogenetic inference from saber-toothed cat fossils of Rancho La Brea. *Proc. Natl. Acad. Sci. USA* 89: 9769-9773.
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22. Yoshimura, T., Yuhki, N ., Wang, M.H., Skeel, A. and Leonard, E.J. 1993. Cloning, sequencing, and expression of human macrophage stimulating protein (MSP, MST1) confirms MSP as a member of the family of kringle proteins and locates the MSP gene on chromosome 3. *J. Biol. Chem.* 268: 15461-15468.

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24. Yuhki, N . and O'Brien, S.J. 1994. Exchanges of short polymorphic DNA segments predating speciation in feline major histocompatibility complex class I genes. *J. Mol. Evol.* 39: 22-33.
25. Lopez, J.V., Yuhki, N ., Masuda, R., Modi, W.S. and O'Brien, S.J. 1994. Numt, a recent transfer and tandem amplification of mitochondrial DNA in the nuclear genome of the domestic cat. *J. Mol. Evol.* 39: 174-190.
26. Brown, E.W., Yuhki, N ., Packer, C. and O'Brien, S.J. 1994. A lion lentivirus (LLV) related to feline immunodeficiency virus: Epidemiologic and phylogenetic aspects. *J. Virol.* 68: 5953-5968.
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28. Yuhki, N . and O'Brien, S.J. 1997. Nature and origin of polymorphism in feline major histocompatibility complex (MHC) class II DRA and DRB genes. *J. Immunol.* 158: 2822-2833.
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45. Beck, T., Menninger, J., Murphy, W.J., Nash, W.G., O'Brien, S.J., and Yuhki, N. . 2005. The Feline Major Histocompatibility Complex Is Rearranged by Inversion with a Breakpoint in the Distal Class I Region. *Immunogenet.* 56: 702-709.
46. Baker, C.S., Lento, G.M., Vant, M.D., Deleboat, M.L., O'Brien, S.J. and Yuhki, N. 2006. Diversity and phylogeny of major histocompatibility complex (MHC) class II genes in baleen whales. *Immunogenet.* 58(4): 283-96.
47. Fyfe, J.C., Kurzhals, R.L., Hawkins, M.G., Wang, P., Yuhki, N., Giger, U., Vab Winkle, T.J., Haskins, M.E., Patterson, D.F. and Henthorn, P.S. 2007. A complex rearrangement in GBE1 causes both perinatal hypoglycemic collapse and late-juvenile onset neuromuscular degeneration in glycogen storage diseases type IV of Norwegian forest cats. *Mol. Genet. Metabol.* 90(4): 383-392.
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53. Yuhki N, Mullikin JC, Beck T, Stephens R, O'Brien SJ. 2008. Sequences, Annotation and Single Nucleotide Polymorphism of the Major Histocompatibility Complex in the Domestic Cat. *PLoS ONE* 3(7): e2674. doi:10.1371/journal.pone.0002674
54. Rebecca LaRue, David Derse, Michael Emerman, Warner C. Greene, Stefán R. Jónsson, Nathaniel R. Landau, Martin Löchelt, Harmit S. Malik, Michael H. Malim, Carsten Muenk,

Stephen J. O'Brien, Vinay K. Pathak, Klaus Strebel, Simon Wain-Hobson, Xiao-Fang Yu ,  
Naoya Yuhki and Reuben S. Harris. Guidelines for Naming Non-Primate APOBEC3 Genes  
and Proteins. *J. Virol.* In Press. 2008.

## BOOK CHAPTERS

1. Hosokawa, M., Yuhki N., Morikawa, K., Suzuki, Y., Mizukoshi, T., Sugawara, M. and Kobayashi, H. 1985. The Effect of an Immunostimulatory Protein-Bound Polysaccharide (PSK) on 3-Methylcholanthrene-Induced Tumors in Autochthonous c57bl/6 Mice when Administered in Conjunction with Chemotherapy or Surgery. Ishigami, J. (Ed.), In: *Recent Advances in Chemotherapy, Anticancer Section 2*, pp. 768-769.
2. Winkler, C., Yuhki, N. and O'Brien, S.J. 1990. The Major Histocompatibility Complex of the Felidae. Clegg, M. and O'Brien, S.J. (Eds.), In: *Proceedings of the UCLA Symposium on Molecular and Cellular Biology*, Alan R. Liss, New York, pp. 29-50.
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5. Wentzel, J., Stephens, J.C., Johnson, W.E., Menotti-Raymond, M., Slattery, J.P., Yuhki, N., Carrington, M., Quigley, H., Miquelle, D.G., Tilson, R., Manansang, J., Brady, G., Zhi, L., Wenshi, P., ShiQuiang, H., Johnston, L., Sunquist, M., Karanth, K.U. and O'Brien, S.J. 1999. Subspecies of Tigers: Molecular Assessment Using "Voucher Specimens" of Geographically Traceable Individuals. Seidensticker, J., Christie, S. and Jackson, P. (Eds.), In: *Riding the Tiger: Tiger Conservation in Human-Dominated Landscapes*, University Press, Cambridge, UK, pp. 40-49.
6. Johnson, W.E., Shinyashiku, F., Menotti-Raymond, M., Driscoll, C., Leh, C., Sunquist, M., Johnston, L., Bush, M., Wildt, D., Yuhki, N. and O'Brien, S.J. 1999. Molecular Genetic Characterization of Two Insular Asian Cat Species, Bornean Bay Cat and Iriomote Cat. Wasser, S.P. (Ed.), In: *Evolutionary Theory and Processes: Modern Perspectives*, Kluwer Academic Publishers, New York, pp. 40-49.

## REVIEWS

1. Yuhki, N. 2006. Comparative Structure of Feline and Canine Major Histocompatibility Complex Determined by Whole Genome Shotgun Sequence and BAC Sequences. (IN JAPANESE). MHC: Major Histocompatibility Complex 12(3): 203-214.
2. Yuhki, N. 2007. MHC Typing Systems against Feline Immunodeficiency Virus and Feline Leukemia Virus. (IN JAPANESE) J. Vet. Med., 60(11): 929-932.
3. Yuhki, N. 2008. Topics: The Origin of the Domestic Cat Is Lybica Wild Cat in the Near East. (IN JAPANESE). IDEN., 62(1): 10-12.
4. Yuhki, N. 2008. The Coat Color Gene Mutations in the Domestic Cat. (IN JAPANESE) IDEN. 62(11):20-25.