

CURRICULUM VITAE

Xiaoli Yu, Ph.D.

President and CEO
yuScience, LLC
Neuroimmunology Research

Work Address:

Bioscience Park Center
12635 East Montview Blvd., Suite 131
Aurora, CO 80045
Phone: (303) 842-7276

1. Education

- 2002 Ph.D. in Cell and Molecular Biology at Colorado State University, Ft. Collins, CO
- 2002-2003 Postdoctoral Fellow, Department of Neurology, University of Colorado at Denver Health Sciences Center, Denver, CO

2. Academic appointments

- 2004-2007 Instructor, Department of Neurology, University of Colorado at Denver Health Sciences Center, Denver, CO
- 2007-2014 Assistant Research Professor, Department of Neurology, University of Colorado Denver, Aurora, CO
- 2014-2014 Associate Research Professor, Department of Neurology, University of Colorado Denver, Aurora, CO
- 2014-present President, yuScience, LLC-Neuroimmunology Research
- 2015-present Adjunct Clinical Professor, Department of Neurosurgery, University of Colorado Denver, Aurora, CO

3. Membership in professional organizations

- 2003-present International Society of NeuroVirology
- 2004-present International Society of Neuroimmunology

4. Major Committee and Service Responsibilities

Faculty member of Planning Committee

Rocky Mountain Regional Neuroscience Group, John Sladek, PhD, President,
THURSDAY MAY 16, 2013, Anschutz Medical Campus

Faculty member

Faculty and Staff Multicultural Affairs Committee, University of Colorado Denver,
Office of Inclusion and Outreach, 2011-present

5. Inventions, intellectual property and patents held or pending

Provisional patent applications filed:
“Blood assays for early diagnosis of multiple sclerosis”

6. Teaching record:

- Have trained over 30 undergraduate students, 3 medical students (Research Track), one postdoc, and one neurology resident.

Research Support

- **CCTSI Novel Clinical and Translational Methods** 05/01/14-04/30/15

Development of high affinity phage peptide probes for rapid identification and characterization of the microbiota subsets that contribute to graft-versus-host disease (GVHD) pathogenesis
Role: Principle Investigator
- **Innovation in Translational Neuroscience Award** 02/01/12-01/31/14
Center for NeuroScience, University of Colorado
Bioinformatics Approach to Identify Antigens in Multiple Sclerosis
Role: Principle Investigator (100%)
- **Pilot Research Award** 06/01/11 - 12/31/12
National Multiple Sclerosis Society
Identification of peptide targets in neuromyelitis optica
The major goal of this project is to identify peptide antigen(s) specific for NMO recombinant antibodies.
Role: Principal Investigator (100%)
- **UC Denver School of Medicine Academic Enrichment Fund** 05/01/10-04/30/11
Role: Principle Investigator (100%)
- **Research Grant (RG 3934A1/1)** 10/01/07 – 9/30/10
National Multiple Sclerosis Society
Identification of peptide epitopes/mimotopes relevant to multiple sclerosis
The major goal of this project is to identify peptide epitopes/mimotopes in multiple sclerosis.
Role: Principal Investigator, (75%)
- **Pilot Research Award** 02/01/04 – 01/31/06
National Multiple Sclerosis Society
Identification of MS Antigens with Recombinant Antibodies Cloned from MS CSF B Cells. The major goal of this project is to analyze B cell responses in multiple sclerosis (MS) and to identify an antigen(s) specific for MS.
Role: Principal Investigator (100%)

7. Bibliography

Papers published in peer-reviewed journals

1. **Yu, X.**, Chang, E.S., Mykles, D.L. Characterization of limb autotomy factor-proecdysis (LAF(pro), isolated from limb regenerates, that suspends molting in the land crab *Gecarcinus lateralis*. *Biol. Bull.* 202:204-212, 2002.
2. Koenders, A., **Yu, X.**, Chang, E.S., Mykles, D.L. Ubiquitin and actin expression in claw muscles of land crab, *Gecarcinus lateralis*, and American lobster, *Homarus americanus*: differential expression of ubiquitin in two slow muscle fiber types during molt-induced atrophy. *J. Exp. Zool.* 292:618-632, 2002.
3. **Yu, X.**, Mykles, D.L. Cloning of a muscle-specific calpain from the American lobster *Homarus americanus*: expression associated with muscle atrophy and restoration during moulting. *J. Exp. Biol.* 206:561-575, 2003.
4. Ritchie, A.M., Gilden, D.H., Williamson, R.A., Burgoon, M.P., **Yu, X.**, Helm, K., Corboy, J.R., Owens, G.P.: Comparative analysis of the CD19+ and CD138+ cell antibody repertoires in the cerebrospinal fluid of patients with multiple sclerosis. *J. Immunol.* 173:649-656, 2004. **PMID: 15210828**
5. **Yu, X.**, Owens, G.P., Ritchie, A.M., Burgoon, M.P., Keays, K.M., Gilden, D.H.: Single-cell RT-PCR analysis of cerebrospinal fluid B cell clonality and immunoglobulin heavy and light chain variable region gene mutation in diffuse large B-cell lymphoma. *Gene Ther. Mol. Biol.* 9:1-6, 2005.
6. Owens, G.P., Shearer, A.J., **Yu, X.**, Ritchie, A.M., Keays, K.M., Bennett, J.L., Gilden, D.H., Burgoon, M.P.: Screening random peptide libraries with subacute sclerosing panencephalitis brain-derived recombinant antibodies identifies multiple epitopes in the C-terminal region of the measles virus nucleocapsid protein. *J. Virol.* 80:12121-12130, 2006. **PMID: 17130301**
7. Burgoon, M.P., Caldas, Y.A., Keays, K.M., **Yu, X.**, Gilden, D.H., Owens, G.P.: Recombinant antibodies generated from both clonal and less abundant plasma cell IgG sequences in SSPE brain are directed against measles virus. *J. NeuroVirol.* 12:398-402, 2006. **PMID: 17065133**
8. **Yu, X.**, Gilden, D.H., Ritchie, A.M., Burgoon, M.P., Keays, K.M., Owens, G.P.: Specificity of recombinant antibodies generated from multiple sclerosis cerebrospinal fluid probed with a random peptide library. *J. Neuroimmunol.* 172:121-131, 2006. **PMID: 16371235**
9. **Yu, X.**, Owens, G.P., Gilden, D.H.: Rapid and efficient identification of epitopes/mimotopes from random peptide libraries. *J. Immunol. Methods* 316:67-74, 2006. **PMID: 17010370**
10. **Yu, X.**, Burgoon, M.P., Shearer, A.J. and Gilden, D.H.: Characterization of phage peptide interaction with antibody using phage mediated immuno-PCR. *J. Immunol Methods.* 326:33-40, 2007. **PMID: 17669417**
11. Wings, K.M., Gilden, D.H., Bennett J.L., **Yu, X.**, Ritchie A.M. and Owens G.P.: Analysis of multiple sclerosis cerebrospinal fluid reveals a continuum of clonally

related antibody-secreting cells that are predominantly plasma blasts. *J. Neuroimmunol.* 192:226-234, 2007. **PMID: 17997491**

12. **Yu, X.**, Barmina, O., Burgoon M.P. and Gilden, D.H. Identification of measles virus epitopes using an ultra-fast method of panning phage-displayed random peptide libraries. *J. Virol. Methods.* 156: 169-173, 2009. **PMID: 19095007**
13. Owens, GP, Bennett, JL, Lassmann, H, O'Connor, KC, Ritchie, AM, Shearer, A, Lam, C, **Yu, X.**, Birlea, M, DuPree, C, Williamson, RA, Hafler, DA, Burgoon, MP, Gilden, D. Antibodies produced by clonally expanded plasma cells in multiple sclerosis CSF. *Annals of Neurology*, 19: 65(6):639-649, 2009. **PMID: 19557869**
14. Wu, F.F., Chen, L., Liu, X., Su, P. Li, M, **Yu, X.**, Li, Q. A novel CD29-like protein expressed in Japanese lamprey (*Lethenteron japonicum*) and involved in immune response. *Fish & Shellfish Immunology.* 29: 407-413, 2010. **PMID: 20488245**
15. **Yu, X.**, Gilden, D., Chambers, L., Barmina, O., Burgoon, M., Bennett, JL, and Owens, GP. Peptide reactivity between multiple sclerosis (MS) CSF IgG and recombinant antibodies generated from clonally expanded plasma cells in MS CSF. *J. Neuroimmunol.* 233: 192-203, 2011. **PMID: 21176973**
16. **Yu, X.**, Green M., Gilden, D., Lam C., Bautista A., Bennett, L. Identification of peptide targets in neuromyelitis optica. *J. Neuroimmunol.* 236 (1-2): 65-71, 2011. **PMID: 21621279**
17. **Yu, X.**, Burgoon, M., Green M., Barmina O., Dennison K., Pointon T., Davis M and Gilden D. Intrathecally synthesized IgG in multiple sclerosis cerebrospinal fluid recognizes identical epitopes over time. *J. Neuroimmunol.* 240-241. 129–136. 2011.
18. Owens, G.P., Gilden, D.H., Burgoon, M.P., **Yu, X.**, Bennett, J.L. Viruses and Multiple Sclerosis. *The Neuroscientist.* 2011. 17: 659 **PMID: 21531984**
19. **Yu, X.**, Seitz, S., Pointon, T., Bowlin, J., Cohrs, R., Jonjić, S., Haas, J., Wellish, M. and Gilden, D. Varicella zoster virus infection of highly pure terminally differentiated human neurons. *J. Neurovirol.* 19:75–81, 2013.
20. Grose, C, **Yu, X.**, Cohrs, R., Carpenter, J., Johnson, J., and Gilden, D. Aberrant Virion Assembly and Limited gC Production in Varicella Zoster Virus Infected Neurons. *Journal of Virology.* doi:10.1128/JVI.01506-13, 2013.
21. Baird, N, **Yu, X.**, Cohrs, R, and Gilden, D. VZV-Human Neuron Interaction. *Viruses*, 5, 2106-2115. 2013.

Book chapters

1. Bennett, J.L., **Yu, X.**, Gilden, D.H., Burgoon, M.P., Owens, G.P.: Infectious agents and multiple sclerosis. *In: Multiple Sclerosis: A Comprehensive Text* (C.S. Raine, H.F. McFarland, R. Hohlfeld, eds.) Elsevier, Inc., 2008.

Scientific abstracts published or presented at scientific meetings

Oral Presentation

Yu, X., Gilden, D.H., Ritchie, A.M., Burgoon, M.P., Keays, K.M., Owens, G.P. Probing the Specificity of MS Recombinant Antibodies with a Random Peptide Library. 7th International Congress, International Society of Neuroimmunology, Venice, Italy. 2004.

Poster Presentations

1. **Yu, X.,** Mykles, D.L. Cloning of a muscle-specific calpain from the American lobster *Homarus americanus*. FASEB Summer Research Conference: "The Calpain System in Health and Disease", Copper Mountain, CO. 1999.
2. **Yu, X.,** and Mykles D.L. Characterization of limb autotomy factor-proecdysis (LAF (pro), isolated from limb regenerates, that suspends molting in the land crab *Gecarcinus lateralis*. Society of Integrative and Comparative Biology, Atlanta, Georgia. 2000.
3. **Yu, X.,** Mykles, D.L. Cloning of a muscle-specific calpain from the American lobster *Homarus americanus*: expression associated with muscle atrophy and restoration during moulting. FASEB Summer Research Conference. "The Calpain System in Health and Disease", Whitefish, Montana. 2001.
4. Gregory P. Owens, Alanna M. Ritchie, **Xiaoli Yu,** Mark P Burgoon, R. Anthony Williamson and Donald H. Gilden. Single-cell repertoire analysis demonstrates that clonal expansion is a prominent feature of the B cell response in multiple sclerosis cerebrospinal fluid. 5th International Symposium on Neurovirology. Baltimore, MD, 2003.
5. Gregory P Owens, Alanna Ritchie, Jeffrey Bennett, Kurt Haubold, **Xiaoli Yu,** Mark P Burgoon, R. Anthony Williamson and Donald H. Gilden. A comparative single-cell analysis of the CD19+ and CD138+ cell antibody repertoires in the cerebrospinal fluid of patients with multiple sclerosis. 7th International Congress, International Society of Neuroimmunology, Venice, Italy. 2004.
6. Mark P. Burgoon, Kathryn M. Keays, Gregory P. Owens, Alanna Ritchie, **Xiaoli Yu,** Donald H. Gilden. Laser microdissection and single-cell RT-PCR analysis of IgG repertoire in SSPE brain. 7th International Congress, International Society of Neuroimmunology, Venice, Italy. 2004.
7. Gregory P Owens, Andrew J Shearer, **Xiaoli Yu,** Alanna M Ritchie, Kathryn M Keays, Jeffrey L Bennett, Donald H. Gilden, and Mark P Burgoon: Screening random peptide libraries with SSPE brain-derived recombinant antibodies identifies multiple epitopes in the C-terminal region of the measles virus nucleocapsid protein. 7th International Symposium on Neurovirology, Philadelphia, PA, 2006.
8. Mark P. Burgoon, Yupanqui A. Caldas, Kathryn M. Keays, Gregory P. Owens, **Xiaoli Yu,** Donald H. Gilden: Both clonally expanded and less abundant plasma cells dissected by LCM from SSPE brain produce IgG against disease-relevant antigens. 7th International Symposium on Neurovirology, Philadelphia, PA, 2006.
9. Kimberly M. Wings, Gregory P. Owens, Jeffrey L. Bennett, **Xiaoli Yu,** PhD, John R. Corboy, and Donald H. Gilden. Plasmablasts are the predominant clonally expanded cells in multiple sclerosis cerebrospinal fluid. Prague, 23rd Congress of the European Committee for the Treatment and Research in Multiple Sclerosis, Czech Republic. 2007.
10. **Xiaoli Yu,** Cecily Dupree, Greg Owens and Donald Gilden. Identification of Epstein Barr virus epitopes in multiple sclerosis cerebrospinal fluid using phage-displayed random peptide libraries. 8th International Symposium for Neurovirology, San Diego, CA, 2007.
11. Mark P. Burgoon, Yupanqui A. Caldas, Jeffrey L. Bennett, **Xiaoli Yu,** Gregory P. Owens, and Donald H. Gilden. The B cell repertoire in SSPE brain shares most features with the plasma cell repertoire. 8th International Symposium for Neurovirology, San Diego, CA, 2007.

12. Gregory P. Owens, Alanna M. Ritchie, Andrew Shearer, Mark P. Burgoon, **Xiaoli Yu**, Jeffrey L. Bennett, and Donald H. Gilden. Expanded Plasma Cell Clones in Multiple Sclerosis CSF do not Produce Antibody against Abundant Myelin Proteins. World Congress on Treatment and Research in Multiple Sclerosis, the first joint meeting of ACTRIMS, ECTRIMS and LACTRIMS. Montreal, Canada. 2008.
13. **Xiaoli Yu**, Miyoko Green, Rengasamy Asokan, Chiwah Lam, Katherine Bautista, Donald H Gilden and Jeffrey L Bennett. Identification of Peptide Targets in Neuromyelitis Optica. 10th International Congress, International Society of Neuroimmunology, Sitges, ES, 2010.
14. Mark P Burgoon, Sarah A Anderson, Breanna Miller, **Xiaoli Yu**, Jeffrey L Bennett, Don Gilden and Gregory P Owens, 2010. Reactivity to human antigens of antibodies produced in multiple sclerosis plaques. 10th International Congress, International Society of Neuroimmunology, Sitges, ES, 2010.
15. Fenfang Wu, Liyong Chen, **Xiaoli Yu**, Xin Liu, Huaying Wang , Peng Su, Yinglun Han, Mo Li, Bo Feng, Xu Qiao, Jing Zhao, Ning Ma, Meng Liang, Huijie Liu, Zhen Zheng, and Qingwei Li. Lamprey variable lymphocyte receptors mediate complement-dependent cytotoxicity. The 99th AAI Annual Meeting, Boston, MA. 2012.
16. **Xiaoli Yu**, Scott Seitz, Ling-Jia Hu, Randy Cohrs, Ravi Mahalingam, Don Gilden. Varicella-Zoster Virus Infection of Terminally Differentiated Human Neurons. 11th International Symposium on Neurovirology. New York, NY. 2012.
17. Nicholas L. Baird, Jacqueline L. Bowlin, Kenneth L. Jones, **Xiaoli Yu**, Randall J. Cohrs and Don Gilden. Neurons are not killed by varicella zoster virus. 12th International Symposium on Neurovirology. Washington DC, 2013.
18. Charles Grose, Jacqueline Bowlin, Tiffany Pointon, Dicle Gunaydin, Randall Cohrs, Don Gilden, and **Xiaoli Yu**. Ultrastructural and gC expression analysis of VZV-infected human neurons. Rocky Mountain Branch of the American Society for Microbiology Spring meeting, Colorado State University, Ft. Collins, CO. 2013.
19. Charles Grose, Jacqueline Bowlin, Tiffany Pointon, Dicle Gunaydin, Randall Cohrs, Don Gilden, and **Xiaoli Yu**. Ultrastructural and gC expression analysis of VZV-infected human neurons. Rocky Mountain Regional Neuroscience Group Annual Meeting. Anschutz Medical Campus, Aurora, CO. 2013.
20. Jacqueline Bowlin, Charles Grose, Randall Cohrs, Nicholas Baird, **Xiaoli Yu**, and Don Gilden. Varicella Zoster Virus – Human Neuron Interaction. 2nd Annual CDI User Group Meeting, Madison, WI. 2013.
21. T. Curley, T. Pointon, H. Collins, K. Dennison, G. Im, M. Graner, D. Wagner, **X. Yu**. Reduced level of sialylated IgG antibody in the CSF of patients with multiple sclerosis. 2014 Joint ACTRIMS-ECTRIMS Meeting, Boston, Sep 10-13, 2014.
22. T. Pointon, S. Manton, M. Davis, G. Braiotta, L. Chambers, T. Edwards, B. Polonsky, M. Graner, M. Burgoon, **X. Yu**. Intrathecal IgG from patients with multiple sclerosis target patient-specific phage peptides. 2014 Joint ACTRIMS-ECTRIMS Meeting, Boston, Sep 10-13, 2014.
23. H. Collins, D. Gunaydin, K. Tamanito, A. Dolei, **X. Yu**. EBV nuclear antigen-1 epitope reactive to intrathecal antibodies in the cerebrospinal fluid of patients with multiple sclerosis. Joint ACTRIMS-ECTRIMS Meeting, Boston, Sep 10-13, 2014.
24. I. Stewart, X. Li, M. Graner, T. Vollmer, **X. Yu**. Serum immunoglobulin G antibodies in multiple sclerosis are elevated. Keystone Symposia: Neuroinflammation in Diseases of the Central Nervous System, January 25—30, 2015, Taos, New Mexico, USA.
25. Ian Stewart, Xiaomeng Li, Yiting Liu, Michael Graner, **Xiaoli Yu**. Thermal Stable Immunoglobulin G Antibodies in Multiple Sclerosis. The 67th AAN Annual Meeting at the Walter E. Washington Convention Center in Washington, DC, April 18-25, 2015.