



Laramie Duncan

Assistant Professor of Psychiatry and Behavioral Sciences (Major Laboratories and Clinical Translational Neurosciences Incubator)

 Curriculum Vitae available Online

Bio

ACADEMIC APPOINTMENTS

- Assistant Professor, Psychiatry and Behavioral Sciences
- Member, Bio-X
- Member, Wu Tsai Neurosciences Institute

HONORS AND AWARDS

- Jaswa Innovator Award, Stanford Psychiatry and Behavioral Sciences (2022)
- Bio-X Star Mentor Award, Bio-X, Stanford University (2021)
- Rising Star Oral Presentation Session, Society of Biological Psychiatry (2021)
- Chairman's Award: Advancing Science, Stanford Psychiatry and Behavioral Sciences (2020)
- Excellence in Teaching Award, Stanford Psychiatry Residency (2019)
- Reviewer's Choice Award, American Society for Human Genetics (2017)
- ISPG Travel Award, World Congress of Psychiatric Genetics (2012)
- Oral Presentation Award Finalist, World Congress of Psychiatric Genetics (2012)
- Fulker Award, Best paper in Behavioral Genetics (2010)
- University Scholarship, University of Georgia (2004)
- Presidential Scholar, University of Georgia (2003)
- Foundation Fellowship (full scholarship + international travel), University of Georgia (1998)
- Governor's Scholarship, University of Georgia (1998)
- National Merit Scholarship, University of Georgia (1998)
- Robert C. Byrd Honors Scholarship, University of Georgia (1998)
- Scholar Athlete Award, Rotary Club (1998)

PROFESSIONAL EDUCATION

- Postdoc, Harvard Medical School , Statistical Genetics (2016)
- Internship, Harvard Medical School , Clinical Psychology (2011)
- PhD, University of Colorado , PhDs Clinical Psychology & Neuroscience (2011)
- BS, University of Georgia , Honors Interdisciplinary Studies (2003)

LINKS

- Lab website: IMHL: <https://www.laramieduncan.com>
- Google Scholar: <https://scholar.google.com/citations?user=tR9NhrQAAAAJ&hl=en>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

We study genetic and environmental effects on mental health. Much of our work is computational and it relies upon genetic data, collected from millions of individuals, from around the world. We use genetic approaches because the overall goal of the lab is to discover fundamental information about psychiatric disorders, and ultimately to build more rational approaches to classification, prevention, and treatment.

Teaching

COURSES

2022-23

- The Personal Genomics Revolution: Focus on Mental Health: PSYC 56N (Win)

2021-22

- The Personal Genomics Revolution: Focus on Mental Health: PSYC 56N (Aut)

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Naghmeh Shahverdizadeh Shargh

Doctoral Dissertation Co-Advisor (AC)

Hanyang Shen

Postdoctoral Research Mentor

Yaffa Serur Schwarzman

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Epidemiology (Masters Program)
- Epidemiology (Phd Program)
- Genetics (Phd Program)
- Neurosciences (Phd Program)

Publications

PUBLICATIONS

- **Integrative analyses highlight functional regulatory variants associated with neuropsychiatric diseases.** *Nature genetics*
Guo, M. G., Reynolds, D. L., Ang, C. E., Liu, Y., Zhao, Y., Donohue, L. K., Siprashvili, Z., Yang, X., Yoo, Y., Mondal, S., Hong, A., Kain, J., Meservey, et al
2023
- **HOT FLASH GWAS REVEALS SUBSTANTIAL GENETIC OVERLAP WITH PSYCHIATRIC DISORDERS AND A TOP LOCUS THAT SIGNALS A HIGHLY EFFECTIVE AND NOVEL TREATMENT TARGET**
Werwath, K., Lawn, R., Shen, H., Salem, M., Li, T., Koenen, K., Martin, N., Gordon, S., Vemuri, M., Duncan, L.
ELSEVIER.2023: S80
- **Correlates of preconception and pregnancy hair cortisol concentrations.** *Research square*

- Juvinao-Quintero, D. L., Künzel, R. G., Larabure-Torrealva, G., Duncan, L., Kirschbaum, C., Sanchez, S. E., Gelaye, B.
2023
- **Lifelong restructuring of 3D genome architecture in cerebellar granule cells.** *Science (New York, N.Y.)*
Tan, L., Shi, J., Moghadami, S., Parasar, B., Wright, C. P., Seo, Y., Vallejo, K., Cobos, I., Duncan, L., Chen, R., Deisseroth, K.
2023; 381 (6662): 1112-1119
 - **Are novel treatments for brain disorders hiding in plain sight?** *Neuropsychopharmacology : official publication of the American College of Neuropsychopharmacology*
Duncan, L., Deisseroth, K.
2023
 - **Cerebellar Granule Cells Develop Non-neuronal 3D Genome Architecture over the Lifespan.** *bioRxiv : the preprint server for biology*
Tan, L., Shi, J., Moghadami, S., Wright, C. P., Parasar, B., Seo, Y., Vallejo, K., Cobos, I., Duncan, L., Chen, R., Deisseroth, K.
2023
 - **Polygenic scores for psychiatric disorders in a diverse postmortem brain tissue cohort.** *Neuropsychopharmacology : official publication of the American College of Neuropsychopharmacology*
Duncan, L., Shen, H., Schulmann, A., Li, T., Kolachana, B., Mandal, A., Feng, N., Auluck, P., Marengo, S.
2023
 - **POLYGENIC RISK SCORES FOR PSYCHIATRIC DISORDERS IN A DIVERSE POSTMORTEM BRAIN TISSUE COHORT**
Shen, H., Schulmann, A., Li, T., Kolachana, B., Mandal, A., Feng, N., Auluck, P., Marengo, S., Duncan, L.
ELSEVIER.2022: E301-E302
 - **HOT FLASHES AS A MODEL FOR UNDERSTANDING POLYGENIC BRAIN PHENOTYPES**
Duncan, L., Werwath, K., Shen, H., Lawn, R., Meijssen, J., Li, T., Salem, M.
ELSEVIER.2022: E144
 - **Testosterone Associations With Current Depression and Schizophrenia, and Future PTSD in the UK Biobank**
Meijssen, J., Shen, H., Reiter, J., Stafford, C., Duncan, L.
ELSEVIER SCIENCE INC.2022: S234
 - **Shared genetic influences on depression and menopause symptoms.** *Psychological medicine*
Meijssen, J. J., Shen, H., Vemuri, M., Rasgon, N. L., Koenen, K. C., Duncan, L. E.
2021: 1-11
 - **HOT FLASH: A GWAS WITH NOTABLE INTERPRETABILITY AND PSYCHIATRIC RELEVANCE**
Duncan, L., Werwath, K., Shen, H., Li, T., Vemuri, M., Meijssen, J.
ELSEVIER.2021: E45
 - **Enhancing Discovery of Genetic Variants for Posttraumatic Stress Disorder Through Integration of Quantitative Phenotypes and Trauma Exposure Information.** *Biological psychiatry*
Maihofer, A. X., Choi, K. W., Coleman, J. R., Daskalakis, N. P., Denckla, C. A., Ketema, E., Morey, R. A., Polimanti, R., Ratanatharathorn, A., Torres, K., Wingo, A. P., Zai, C. C., Aiello, et al
2021
 - **Dissecting the Shared Genetic Architecture of Suicide Attempt, Psychiatric Disorders, and Known Risk Factors.** *Biological psychiatry*
Mullins, N., Kang, J., Campos, A. I., Coleman, J. R., Edwards, A. C., Galfalvy, H., Levey, D. F., Lori, A., Shabalin, A., Starnawska, A., Su, M., Watson, H. J., Adams, et al
2021
 - **Shared Genetic Effects may Partially Explain Higher Depression and PTSD Prevalence Among Women Using Hormone Therapy (HT)**
Duncan, L., Meijssen, J., Shen, H., Vemuri, M., Rasgon, N., Koenen, K.
ELSEVIER SCIENCE INC.2021: S101-S102
 - **Examining Sex-Differentiated Genetic Effects Across Neuropsychiatric and Behavioral Traits.** *Biological psychiatry*
Martin, J., Khramtsova, E. A., Goleva, S. B., Blokland, G. A., Traglia, M., Walters, R. K., Hubel, C., Coleman, J. R., Breen, G., Borglum, A. D., Demontis, D., Grove, J., Werge, et al
2021

- **Machine learning reveals bilateral distribution of somatic L1 insertions in human neurons and glia.** *Nature neuroscience*
Zhu, X. n., Zhou, B. n., Pattni, R. n., Gleason, K. n., Tan, C. n., Kalinowski, A. n., Sloan, S. n., Fiston-Lavier, A. S., Mariani, J. n., Petrov, D. n., Barres, B. A., Duncan, L. n., Abyzov, et al
2021
- **Sex-Dependent Shared and Nonshared Genetic Architecture Across Mood and Psychotic Disorders.** *Biological psychiatry*
Blokland, G. A., Grove, J., Chen, C. Y., Cotsapas, C., Tobet, S., Handa, R., St Clair, D., Lencz, T., Mowry, B. J., Periyasamy, S., Cairns, M. J., Tooney, P. A., Wu, et al
2021
- **Higher Depression and PTSD Prevalence Among Women Using Hormone Replacement Therapy (HRT) May Be Due to Shared Genetic Effects**
Duncan, L.
SPRINGERNATURE.2020: 9
- **Shared Molecular Genetic Risk of Alcohol Dependence and Posttraumatic Stress Disorder (PTSD)** *PSYCHOLOGY OF ADDICTIVE BEHAVIORS*
Sheerin, C. M., Bountress, K. E., Meyers, J. L., de Viteri, S., Shen, H., Maihofer, A. X., Duncan, L. E., Amstadter, A. B., PGC-PTSD Workgrp, PGC-SUD Workgrp
2020; 34 (5): 613–19
- **Short-term mental health sequelae of bereavement predict long-term physical health decline in older adults: US Health and Retirement Study Analysis.** *The journals of gerontology. Series B, Psychological sciences and social sciences*
Domingue, B. W., Duncan, L., Harrati, A., Belsky, D. W.
2020
- **Shared genetic risk between eating disorder- and substance-use-related phenotypes: Evidence from genome-wide association studies.** *Addiction biology*
Munn-Chernoff, M. A., Johnson, E. C., Chou, Y., Coleman, J. R., Thornton, L. M., Walters, R. K., Yilmaz, Z., Baker, J. H., Hubel, C., Gordon, S., Medland, S. E., Watson, H. J., Gaspar, et al
2020: e12880
- **Genomic influences on self-reported childhood maltreatment.** *Translational psychiatry*
Dalvie, S., Maihofer, A. X., Coleman, J. R., Bradley, B., Breen, G., Brick, L. A., Chen, C., Choi, K. W., Duncan, L. E., Guffanti, G., Haas, M., Harnal, S., Liberzon, et al
2020; 10 (1): 38
- **Polygenic prediction and GWAS of depression, PTSD, and suicidal ideation/self-harm in a Peruvian cohort.** *Neuropsychopharmacology : official publication of the American College of Neuropsychopharmacology*
Shen, H. n., Gelaye, B. n., Huang, H. n., Rondon, M. B., Sanchez, S. n., Duncan, L. E.
2020
- **Analysis of Genetically Regulated Gene Expression Identifies a Prefrontal PTSD Gene, SNRNP35, Specific to Military Cohorts.** *Cell reports*
Huckins, L. M., Chatzinakos, C. n., Breen, M. S., Hartmann, J. n., Klengel, T. n., da Silva Almeida, A. C., Dobbyn, A. n., Girdhar, K. n., Hoffman, G. E., Klengel, C. n., Logue, M. W., Lori, A. n., Maihofer, et al
2020; 31 (9): 107716
- **Molecular genetic overlap between posttraumatic stress disorder and sleep phenotypes.** *Sleep*
Lind, M. J., Brick, L. A., Gehrman, P. R., Duncan, L. E., Gelaye, B., Maihofer, A. X., Nievergelt, C. M., Nugent, N. R., Stein, M. B., Amstadter, A. B., Psychiatric Genomics Consortium Posttraumatic Stress Disorder, Aiello, A. E., Almli, L. M., et al
2019
- **Genome-wide Association Studies in Ancestrally Diverse Populations: Opportunities, Methods, Pitfalls, and Recommendations.** *Cell*
Peterson, R. E., Kuchenbaecker, K., Walters, R. K., Chen, C., Popejoy, A. B., Periyasamy, S., Lam, M., Iyegbe, C., Strawbridge, R. J., Brick, L., Carey, C. E., Martin, A. R., Meyers, et al
2019
- **How genome-wide association studies (GWAS) made traditional candidate gene studies obsolete** *NEUROPSYCHOPHARMACOLOGY*
Duncan, L. E., Ostacher, M., Ballon, J.
2019; 44 (9): 1518–23
- **Genome-wide association study identifies eight risk loci and implicates metabo-psychiatric origins for anorexia nervosa.** *Nature genetics*
Watson, H. J., Yilmaz, Z., Thornton, L. M., Hubel, C., Coleman, J. R., Gaspar, H. A., Bryois, J., Hinney, A., Leppa, V. M., Mattheisen, M., Medland, S. E., Ripke, S., Yao, et al

2019

- **Statistical inference and reproducibility in geobiology** *GEOBIOLOGY*
Sperling, E. A., Tecklenburg, S., Duncan, L. E.
2019; 17 (3): 261–71
- **Association of Economic Status and Educational Attainment With Posttraumatic Stress Disorder A Mendelian Randomization Study** *JAMA NETWORK OPEN*
Polimanti, R., Ratanatharathorn, A., Maihofer, A. X., Choi, K. W., Stein, M. B., Morey, R. A., Logue, M. W., Nievergelt, C. M., Stein, D. J., Koenen, K. C., Gelernter, J., Nievergelt, C. M., Maihofer, et al
2019; 2 (5): e193447
- **Statistical inference and reproducibility in geobiology.** *Geobiology*
Sperling, E. A., Tecklenburg, S., Duncan, L. E.
2019
- **International meta-analysis of PTSD genome-wide association studies identifies sex- and ancestry-specific genetic risk loci.** *Nature communications*
Nievergelt, C. M., Maihofer, A. X., Klengel, T. n., Atkinson, E. G., Chen, C. Y., Choi, K. W., Coleman, J. R., Dalvie, S. n., Duncan, L. E., Gelernter, J. n., Levey, D. F., Logue, M. W., Polimanti, et al
2019; 10 (1): 4558
- **Robust Findings From 25Years of PSTD Genetics Research.** *Current psychiatry reports*
Duncan, L. E., Cooper, B. N., Shen, H.
2018; 20 (12): 115
- **Chromosomes to Social Contexts: Sex and Gender Differences in PTSD.** *Current psychiatry reports*
Kimerling, R., Allen, M. C., Duncan, L. E.
2018; 20 (12): 114
- **The Anorexia Nervosa Genetics Initiative (ANGI): Overview and methods.** *Contemporary clinical trials*
Thornton, L. M., Munn-Chernoff, M. A., Baker, J. H., Jureus, A., Parker, R., Henders, A. K., Larsen, J. T., Petersen, L., Watson, H. J., Yilmaz, Z., Kirk, K. M., Gordon, S., Leppa, et al
2018; 74: 61–69
- **Analysis of shared heritability in common disorders of the brain** *SCIENCE*
Anttila, V., Bulik-Sullivan, B., Finucane, H. K., Walters, R. K., Bras, J., Duncan, L., Escott-Price, V., Falcone, G. J., Gormley, P., Malik, R., Patsopoulos, N. A., Ripke, S., Wei, et al
2018; 360 (6395): 1313–+
- **Largest GWAS of PTSD (N=20,070) Yields Genetic Overlap with Schizophrenia and Sex Differences in Heritability** *Molecular Psychiatry*
Duncan, L. E., Ratanatharathorn, A., Aiello, A., Almli, L., Amstadter, A., additional_authors, ., Koenen, K.
2017
- **Genetic Correlation Profile of Schizophrenia Mirrors Epidemiological Results and Suggests Link Between Polygenic and Rare Variant (22q11.2) Cases of Schizophrenia.** *Schizophrenia bulletin*
Duncan, L. E., Shen, H. n., Ballon, J. S., Hardy, K. V., Noordsy, D. L., Levinson, D. F.
2017
- **Significant Locus and Metabolic Genetic Correlations Revealed in Genome-Wide Association Study of Anorexia Nervosa** *American Journal of Psychiatry*
Duncan, L. E., Yilmaz, Z., Gaspar, H., Walters, R., Goldstein, J., Anttila, V., Bulik-Sullivan, B., Ripke, S., Eating Disorders Working Group of the Psychiatric Genomics Consortium, ., Thornton, L., Hinney, A., Daly, M., Sullivan, et al
2017
- **Analysis of protein-coding genetic variation in 60,706 humans** *NATURE*
Lek, M., Karczewski, K. J., Minikel, E. V., Samocha, K. E., Banks, E., Fennell, T., O'Donnell-Luria, A. H., Ware, J. S., Hill, A. J., Cummings, B. B., Tukiainen, T., Birnbaum, D. P., Kosmicki, et al
2016; 536 (7616): 285–?
- **Research Letter: PTSD has shared polygenic contributions with bipolar disorder and schizophrenia in women** *PSYCHOLOGICAL MEDICINE*
Sumner, J. A., Duncan, L., Ratanatharathorn, A., Roberts, A. L., Koenen, K. C.
2016; 46 (3): 669-671

- **An atlas of genetic correlations across human diseases and traits** *NATURE GENETICS*
Bulik-Sullivan, B., Finucane, H. K., Anttila, V., Gusev, A., Day, F. R., Loh, P., Duncan, L., Perry, J. R., Patterson, N., Robinson, E. B., Daly, M. J., Price, A. L., Neale, et al
2015; 47 (11): 1236-?
- **Large Scale Genetic Research on Neuropsychiatric Disorders in African Populations is Needed.** *EBioMedicine*
Dalvie, S., Koen, N., Duncan, L., Abbo, C., Akena, D., Atwoli, L., Chiliza, B., Donald, K. A., Kinyanda, E., Lochner, C., Mall, S., Nakasujja, N., Newton, et al
2015; 2 (10): 1259-1261
- **The Psychiatric Genomics Consortium Posttraumatic Stress Disorder Workgroup: Posttraumatic Stress Disorder Enters the Age of Large-Scale Genomic Collaboration** *NEUROPSYCHOPHARMACOLOGY*
Logue, M. W., Amstadter, A. B., Baker, D. G., Duncan, L., Koenen, K. C., Liberzon, I., Miller, M. W., Morey, R. A., Nievergelt, C. M., Ressler, K. J., Smith, A. K., Smoller, J. W., Stein, et al
2015; 40 (10): 2287-2297
- **The Evaluation of Tools Used to Predict the Impact of Missense Variants Is Hindered by Two Types of Circularity** *HUMAN MUTATION*
Grimm, D. G., Azencott, C., Aicheler, F., Gieraths, U., MacArthur, D. G., Samocha, K. E., Cooper, D. N., Stenson, P. D., Daly, M. J., Smoller, J. W., Duncan, L. E., Borgwardt, K. M.
2015; 36 (5): 513-523
- **Psychiatric genome-wide association study analyses implicate neuronal, immune and histone pathways** *NATURE NEUROSCIENCE*
O'Dushlaine, C., Rossin, L., Lee, P. H., Duncan, L., Parikshak, N. N., Newhouse, S., Ripke, S., Neale, B. M., Purcell, S. M., Posthuma, D., Nurnberger, J. I., Lee, S. H., Faraone, et al
2015; 18 (2): 199-209
- **The Human Ortholog of Acid-Sensing Ion Channel Gene ASIC1a Is Associated With Panic Disorder and Amygdala Structure and Function** *BIOLOGICAL PSYCHIATRY*
Smoller, J. W., Gallagher, P. J., Duncan, L. E., McGrath, L. M., Haddad, S. A., Holmes, A. J., Wolf, A. B., Hilker, S., Block, S. R., Weill, S., Young, S., Choi, E. Y., Rosenbaum, et al
2014; 76 (11): 902-910
- **Clozapine-induced agranulocytosis is associated with rare HLA-DQB1 and HLA-B alleles** *NATURE COMMUNICATIONS*
Goldstein, J. I., Jarskog, L. F., Hilliard, C., Alfirevic, A., Duncan, L., Fouches, D., Huang, H., Lek, M., Neale, B. M., Ripke, S., Shianna, K., Szatkiewicz, J. P., Tropsha, et al
2014; 5
- **Personality Pathology Factors Predict Recurrent Major Depressive Disorder in Emerging Adults** *JOURNAL OF CLINICAL PSYCHOLOGY*
Sheets, E. S., Duncan, L. E., Bjornsson, A. S., Craighead, L. W., Craighead, W. E.
2014; 70 (6): 536-545
- **Mind the Gap Why Many Geneticists and Psychological Scientists Have Discrepant Views About Gene-Environment Interaction (GXE) Research** *AMERICAN PSYCHOLOGIST*
Duncan, L. E., Pollastri, A. R., Smoller, J. W.
2014; 69 (3): 249-268
- **Pathway Analyses Implicate Glial Cells in Schizophrenia** *PLOS ONE*
Duncan, L. E., Holmans, P. A., Lee, P. H., O'Dushlaine, C. T., Kirby, A. W., Smoller, J. W., Oenguer, D., Cohen, B. M.
2014; 9 (2)
- **A polygenic burden of rare disruptive mutations in schizophrenia** *NATURE*
Purcell, S. M., Moran, J. L., Fromer, M., Ruderfer, D., Solovieff, N., Roussos, P., O'Dushlaine, C., Chambert, K., Bergen, S. E., Kahler, A., Duncan, L., Stahl, E., Genovese, et al
2014; 506 (7487): 185-?
- **Genetic Predictors of Risk and Resilience in Psychiatric Disorders: A Cross-Disorder Genome-Wide Association Study of Functional Impairment in Major Depressive Disorder, Bipolar Disorder, and Schizophrenia** *AMERICAN JOURNAL OF MEDICAL GENETICS PART B-NEUROPSYCHIATRIC GENETICS*
McGrath, L. M., Cornelis, M. C., Lee, P. H., Robinson, E. B., Duncan, L. E., Barnett, J. H., Huang, J., Gerber, G., Sklar, P., Sullivan, P., Perlis, R. H., Smoller, J. W.
2013; 162 (8): 779-788

- **From Candidate Genes to Genome-wide Association: The Challenges and Promise of Posttraumatic Stress Disorder Genetic Studies** *BIOLOGICAL PSYCHIATRY*
Koenen, K. C., Duncan, L. E., Liberzon, I., Ressler, K. J.
2013; 74 (9): 634-636
- **Paying Attention to All Results, Positive and Negative** *JOURNAL OF THE AMERICAN ACADEMY OF CHILD AND ADOLESCENT PSYCHIATRY*
Duncan, L. E.
2013; 52 (5): 462-465
- **Conceptual Issues in Psychiatric Gene-Environment Interaction Research Response** *AMERICAN JOURNAL OF PSYCHIATRY*
Duncan, L. E., Keller, M. C.
2012; 169 (2): 223-223
- **A Critical Review of the First 10 Years of Candidate Gene-by-Environment Interaction Research in Psychiatry** *AMERICAN JOURNAL OF PSYCHIATRY*
Duncan, L. E., Keller, M. C.
2011; 168 (10): 1041-1049
- **Understanding the Complex Etiologies of Developmental Disorders: Behavioral and Molecular Genetic Approaches** *JOURNAL OF DEVELOPMENTAL AND BEHAVIORAL PEDIATRICS*
Willcutt, E. G., Pennington, B. F., Duncan, L., Smith, S. D., Keenan, J. M., Wadsworth, S., DeFries, J. C., Olson, R. K.
2010; 31 (7): 533-544
- **Are Extended Twin Family Designs Worth the Trouble? A Comparison of the Bias, Precision, and Accuracy of Parameters Estimated in Four Twin Family Models** *BEHAVIOR GENETICS*
Keller, M. C., Medland, S. E., Duncan, L. E.
2010; 40 (3): 377-393
- **Variation in brain-derived neurotrophic factor (BDNF) gene is associated with symptoms of depression** *JOURNAL OF AFFECTIVE DISORDERS*
Duncan, L. E., Hutchison, K. E., Carey, G., Craighead, W. E.
2009; 115 (1-2): 215-219
- **Modeling Extended Twin Family Data I: Description of the Cascade Model** *TWIN RESEARCH AND HUMAN GENETICS*
Keller, M. C., Medland, S. E., Duncan, L. E., Hatemi, P. K., Neale, M. C., Maes, H. H., Eaves, L. J.
2009; 12 (1): 8-18
- **Experimental vesicular stomatitis virus infection in horses: Effect of route of inoculation and virus serotype** *VETERINARY PATHOLOGY*
Howerth, E. W., Mead, D. G., Mueller, P. O., Duncan, L., Murphy, M. D., Stallknecht, D. E.
2006; 43 (6): 943-955