

Publications to-date resulting from the BBA program

1. Linden, J.B., McCowan, B., Capitanio, J.P., Isbell, L.A., accepted. Early-life measures of temperament predict hair cortisol and rank attainment following new group formation in captive rhesus macaques (*Macaca mulatta*). *American Journal of Primatology*.
2. Vandeleest, J., Capitanio, J.P., Hamel, A., Meyer, J., Novak, M., McCowan, B. Social stability influences the association between adrenal responsiveness and hair cortisol concentrations in rhesus macaques. *Psychoneuroendocrinology*, 2019, 100: 164–171. PMC in progress.
3. Capitanio, J.P. Behavioral inhibition in nonhuman primates: The elephant in the room. Pp. 17-33 in K. Pérez-Edgar, N. A. Fox (Eds.), *Behavioral Inhibition*, 2019. Springer. https://doi.org/10.1007/978-3-319-98077-5_2. PMC exempt.
4. Pittet, F., Johnson, C., Hinde, K. Age at reproductive debut: Developmental predictors and consequences for lactation, infant mass, and subsequent reproduction in rhesus macaques (*Macaca mulatta*). *Am J Phys Anthropol.* 2017 Nov;164(3):457-476. doi: 10.1002/ajpa.23286. PMC5759967.
5. Kinnally, E.L., Gonzalez, M.N., Capitanio, J.P. Three generations of paternal line transgenerational effects of early experience in rhesus macaques. *Dev Psychobiol.* 2018 Aug 13. doi: 10.1002/dev.21771. PMC in progress.
6. Walker, C.K., VandeVoort, C.A., Li, C.-S., Chaffin, C.L., Capitanio, J.P., in press. Obesity and weight gain during pregnancy associate independently with behavior of infant rhesus monkeys (*Macaca mulatta*). *Developmental Psychobiology*. PMC6107411.
7. Gottlieb, D.H., Del Rosso, L., Sheikhi, F., Gottlieb, A., McCowan, B., Capitanio, J.P., accepted. Personality, environmental stressors, and diarrhea in rhesus macaques: an interactionist perspective. *Am J Primatol.* 2018 Aug 28:e22908. doi: 10.1002/ajp.22908.
8. Parker, K.J., Garner, J.P., Oztan, O., Tarara, E.R., Li, J., Selafani, V., Del Rosso, L.A., Chun, K., Berquist, S.W., Chez, M.G., Partap, S., Hardan, A.Y., Sherr, E.H., Capitanio, J.P., in press. Biomarker discovery for social impairments: Translation from a novel monkey model to patients with autism. *Science Translational Medicine*. PMC Journal – In Process.
9. Capitanio, J.P., Vandeleest, J., Hannibal, D.L., in press. Physiological measures of welfare. In L. Robinson & A. Weiss, eds., *Nonhuman Primate Welfare*. NY: Springer. PMC exempt.

10. Capitanio, J.P. Naturally-occurring nonhuman primate models of psychosocial processes. *ILAR Journal*, 2017, 58: 226-234. PMC Journal – In Process.
11. Pittet, F., Johnson, C., Hinde, K. Age at reproductive debut: Developmental predictors and consequences for lactation, infant mass, and subsequent reproduction in rhesus macaques (*Macaca mulatta*). *Am J Phys Anthropol.* 2017 Nov;164(3):457-476. doi: 10.1002/ajpa.23286. PMC5759967.
12. Madrid, J.E., Oztan, O., Sclafani, V., Del Rosso, L.A., Calonder, L.A., Chun, K., Capitanio, J.P., Garner, J.P., Parker, K.J. Preferences for novel faces in male infant monkeys predicts cerebrospinal fluid oxytocin concentrations later in life. *Scientific Reports*, 2017, 7(1):12935. doi:10.1038/s41598-017-13109-5. PMC5636831.
13. Bliss-Moreau, E., Moadab, G., Capitanio, J.P. Maternal rearing environment impacts autonomic nervous system activity. *Developmental Psychobiology*, 2017, 59:551-556. PMC5423540.
14. Golub, M.S., Hackett, E.P., Hogrefe, C.E., Leranth, C., Elsworth, J.D., Roth, R.H. Cognitive performance of juvenile monkeys after chronic fluoxetine treatment. *Developmental Cognitive Neuroscience*, 2017, 26:52-61. PMC5557667.
15. Capitanio, J.P., Blozis, S.A., Snarr, J., Steward, A., McCowan, B.J. Do "birds of a feather flock together" or do "opposites attract"? Behavioral responses and temperament predict success in pairings of rhesus monkeys in a laboratory setting. *American Journal of Primatology*, 2017, 79:1-11. PMC5344041.
16. Golub M.S., Hogrefe C.E, Bulleri, A.M. Regulation of emotional response in juvenile monkeys treated with fluoxetine: MAOA interactions. *Eur Neuropsychopharmacol.*, 2016, 26:1920-1929. PMC5154301.
17. Capitanio, J.P. Variation in BioBehavioral Organization. Pp. 55-73 in S. Schapiro (Ed.), *Handbook of Primate Behavioral Management*, 2017. Boca Raton, FL: CRC Press. PMC exempt.
18. Sclafani V, Del Rosso LA, Seil SK, Calonder LA, Madrid JE, Bone KJ, Sherr EH, Garner JP, Capitanio JP, Parker KJ. Early Predictors of Impaired Social Functioning in Male Rhesus Macaques (*Macaca mulatta*). *PLoS ONE*, 2016, 11(10): e0165401. doi:10.1371/journal.pone.0165401. PMC5082922.
19. Bernstein, R.M. & Hinde, K. Bioactive Factors in Milk Across Lactation: Maternal Effects and Influence on Infant Growth in Rhesus Macaques (*Macaca mulatta*). *American Journal of Primatology*, 2016, 78:838–850. PMC5538777.

20. Su SY, Hogrefe-Phi CE, Asara JM, Turck CW, Golub MS. Peripheral fibroblast metabolic pathway alterations in juvenile rhesus monkeys undergoing long-term fluoxetine administration. *Eur Neuropsychopharmacol.* 2016 Jul;26(7):1110-8. doi: 10.1016/j.euroneuro.2016.03.017. Epub 2016 Apr 12. PMC5590669.
21. Golub, MS, Hogrefe, CE, Bulleri, AM. Peer social interaction is facilitated in juvenile rhesus monkeys treated with fluoxetine. *Neuropharmacology.* 2016 Jun;105:553-60. PMC4873333.
22. Herrington, J.A., Del Rosso, L., Capitanio, J.P. Biobehavioral consequences of prenatal exposure to a matrilineal overthrow and relocation in captive infant rhesus (*Macaca mulatta*) monkeys. *American Journal of Primatology*, 2016, 78:895-903. PMC5378313.
23. Elfenbein, H.A., Del Rosso, L., McCowan, B., Capitanio, J.P. Effect of indoor compared with outdoor location during gestation on the incidence of diarrhea in indoor-reared rhesus macaques (*Macaca mulatta*). *Journal of AALAS*, 2016, 55: 277-290. PMC4865688.
24. Golub, M.S., Hogrefe, C.E. Sleep disturbance as detected by actigraphy in pre-pubertal juvenile monkeys receiving therapeutic doses of fluoxetine. *Neurotoxicol Teratol.* 2016 May-Jun;55:1-7. PMC4884518.
25. Chun, K., Capitanio, J.P. Developmental consequences of behavioral inhibition: A model in rhesus monkeys (*Macaca mulatta*). *Developmental Science*, 2016, 19: 1035-1048. PMC5369653.
26. Kinnally, E.L., Capitanio, J.P. Paternal early experiences influence infant development through non-social mechanisms in rhesus macaques. *Frontiers in Zoology*, 2015, 12(Suppl 1):S14. PMC4722344.
27. Golub, M.S., Hogrefe, C.E. Fetal iron deficiency and genotype influence emotionality in infant rhesus monkeys. *Journal of Nutrition*, 2015, 145: 647-653. PMC4336538.
28. Golub, M.S., Bulleri, A.M., Hogrefe, C.E., Sherwood, R.J. Bone growth in juvenile rhesus monkeys is influenced by 5HTTLPR polymorphisms and interactions between 5HTTLPR polymorphisms and fluoxetine. *Bone.* 2015 Oct;79:162-9. doi: 10.1016/j.bone.2015.05.042. PMC4511468.
29. Hinde, K., Skibiel, A.L., Foster, A.B., Del Rosso, L., Mendoza, S.P., Capitanio, J.P. Cortisol in mother's milk reflects maternal life history and predicts infant temperament. *Behavioral Ecology*, 2015, 26: 269-281. PMC4309982.

30. Golub, M.S., Hogrefe, C.E. Sleep patterns in male juvenile monkeys influenced by gestational iron deficiency and MAOA genotype. *British Journal of Nutrition*, 2014 112(9):1478-83. PMC4215648.
31. Hennessy, M.B., McCowan, B., Jiang, J., Capitanio, J.P. Depressive-like behavioral response of adult male rhesus monkeys during routine animal husbandry procedure. *Frontiers in Behavioral Neuroscience*, 2014, 8:309. doi: 10.3389/fnbeh.2014.00309. PMC4159029.
32. He, Y., Hogrefe, C.E., Grapov, D., Palazoglu, M., Fiehn, O., Turck, C.W., Golub, M.S. Identifying individual differences of fluoxetine response in juvenile rhesus monkeys by metabolite profiling. *Transl Psychiatry* (2014) 4, e478; doi:10.1038/tp.2014.116. PMC4259988.
33. Golub, M., Hogrefe, C. Prenatal iron deficiency and monoamine oxidase A (MAOA) polymorphisms: combined risk for later cognitive performance in rhesus monkeys. *Genes Nutr.* 2014 Mar;9(2):381. PMC3968295.
34. Bauman, M.D., Iosif, A.M., Ashwood, P., Braunschweig, D., Lee, A., Schumann, C.M., Van de Water, J., Amaral, D.G. Maternal antibodies from mothers of children with autism alter brain growth and social behavior development in the rhesus monkey. *Transl Psychiatry*. 2013 Jul 9;3:e278. doi: 10.1038/tp.2013.47. PMC3731783.
35. Golub, M.S., Hogrefe, C.E. Predictors of hemoglobin variability in a population of weaning age (3- to 4-month old) rhesus monkeys. *Am J Primatol.* 2013, 75(11):1139-46. PMC4201538.
36. Bauman, M.D., Iosif, A.M., Smith, S.E., Bregere, C., Amaral, D.G., Patterson, P.H. Activation of the maternal immune system during pregnancy alters behavioral development of rhesus monkey offspring. *Biol Psychiatry*. 2014 Feb 15;75(4):332-41. doi: 10.1016/j.biopsych.2013.06.025. Epub 2013 Sep 5.
37. Weinstein, T.A.R., Bales, K.L., Maninger, N., Hostetler, C.M., Capitanio, J.P. Early involvement in friendships predicts later plasma concentrations of oxytocin and vasopressin in juvenile rhesus macaques (*Macaca mulatta*). *Frontiers in Behavioral Neuroscience*, 2014, 8:295. doi: 10.3389/fnbeh.2014.00295. PMC4147354.
38. Beisner, B.A., McCowan, B. Signaling context modulates social function of silent bared-teeth displays in rhesus macaques (*Macaca mulatta*). *Am J Primatol.*, 2014, 76(2), 111-21. PMC3919452.
39. Sorenson, A., Sullivan, E.C., Mendoza, S.P., Capitanio, J.P., Higley, J.D. Serotonin transporter genotype modulates HPA axis output during stress: Effect of stress,

- dexamethasone test and ACTH challenge. *Translational Developmental Psychiatry*, 2013, 1, 21130 - PMC4109987.
40. Gottlieb, D.H., Capitanio, J.P., McCowan, B. Risk factors for stereotypic behavior and self-biting in rhesus macaques (*Macaca mulatta*); Animal's history, current environment, and personality. *American Journal of Primatology*, 2013, 75: 995-1008. PMC3973020.
 41. Vandeleest, J.J., Blozis, S.A., Mendoza, S.P., Capitanio, J.P. The effects of birth timing and ambient temperature on the hypothalamic-pituitary-adrenal axis in 3-4 month old rhesus monkeys. *Psychoneuroendocrinology*, 2013, 38:2705-2712. PMC3812365.
 42. Gottlieb, D.H., Capitanio, J.P. Latent variables affecting behavioral response to the human intruder test in infant rhesus monkeys (*Macaca mulatta*). *American Journal of Primatology*, 2013, 75, 314-323. PMC3581725.
 43. Chun, K., Miller, L.A., Schelegle, E.S., Hyde, D.M., Capitanio, J.P. Behavioral inhibition in rhesus monkeys (*Macaca mulatta*) is related to the airways response, but not immune measures, commonly associated with asthma. *PLoS ONE*, 2013, 8(8): e71575. doi:10.1371/journal.pone.0071575. PMC3739724.
 44. Vandeleest, J.J., Mendoza, S.P., Capitanio, J.P. Birth timing and the mother-infant relationship predict variation in infant behavior and physiology. *Developmental Psychobiology*, 2013, 55: 829-837.
 45. Jiang, J., Kanthaswamy, S., Capitanio, J.P. Degree of Chinese ancestry affects behavioral characteristics of infant rhesus monkeys (*Macaca mulatta*). *Journal of Medical Primatology*, 2013, 42, 20-27. PMC3632404.
 46. Karere, G.M., Sullivan, E., Kinnally, E.L., Capitanio, J.P., Lyons, L.A. Enhancing genotyping of MAOA and 5-HTT in rhesus macaques (*Macaca mulatta*). *Journal of Medical Primatology*, 2012, 41, 407-411. PMC3492537.
 47. Vandeleest, J.J., Capitanio, J.P. Birth timing and behavioral responsiveness predict individual differences in the mother-infant relationship and infant behavior during weaning and maternal breeding. *American Journal of Primatology*, 2012, 74, 734-746. PMC3896920.
 48. Capitanio, J.P., Del Rosso, L.A., Calonder, L.A., Blozis, S.A., Penedo, M.C.T. Behavioral effects of prenatal ketamine exposure in rhesus macaques are dependent on MAOA genotype. *Experimental and Clinical Psychopharmacology*, 2012, 20, 173-180. PMC3481859.

49. Golub, M.S., Hogrefe, C.E., Unger, E.L. Influence of prenatal iron deficiency and MAOA genotype on response to social challenge in rhesus monkey infants. *Genes, Brain and Behavior*, 2012, 11, 278-90.
50. Weinstein, T.A.R., Capitanio, J.P. Longitudinal stability of friendships in rhesus monkeys: Individual- and relationship-level effects. *Journal of Comparative Psychology*, 2012, 126, 97-108. PMC3592481.
51. Jin, L., Hinde, K., Tao, L. Species diversity and relative abundance of lactic acid bacteria in the milk of rhesus monkeys (*Macaca mulatta*). *J. Med. Primatol.*, 2011, 40, 52-8.
52. Sullivan, E.C., Mendoza, S.P., Capitanio, J.P. Similarity in temperament between mother and offspring rhesus monkeys: Sex differences and the role of monoamine oxidase-A and serotonin transporter promoter polymorphism genotypes. *Developmental Psychobiology*, 2011, 53, 549-563. PMC3162344.
53. Rommeck, I., Capitanio, J.P., Strand, S.C., McCowan, B. Early social experience affects behavioral and physiological responsiveness to stressful conditions in infant rhesus macaques (*Macaca mulatta*). *Am. J. Primatol.*, 2011, 73, 692-701. PMC3100413.
54. Vandeleest, J.J., McCowan, B., Capitanio, J.P. Early rearing interacts with temperament and housing to influence the risk for motor stereotypy in rhesus monkeys (*Macaca mulatta*). *Applied Animal Behaviour Science*, 2011, 132, 81-89. PMC3084485.
55. Capitanio, J.P., Miller, L.A., Schelegle, E.S., Mendoza, S.P., Mason, W.A., Hyde, D.M. Behavioral inhibition is associated with airway hyper-responsiveness but not atopy in a monkey model of asthma. *Psychosom. Med.*, 2011, 73, 288-294. PMC3090450.
56. Sullivan, E., Hinde, K., Mendoza, S.P., Capitanio, J.P. Cortisol concentrations in the milk of rhesus monkey mothers are associated with confident temperament in sons, but not daughters. *Developmental Psychobiology*, 2011, 53, 96-104. PMC3188439.
57. Capitanio, J.P., Mendoza, S.P., Cole, S.W. Nervous temperament in infant monkeys is associated with reduced sensitivity of leukocytes to cortisol's influence on trafficking. *Brain, Behavior, and Immunity*, 2011, 25, 151-159. PMC2991489
58. Kinnally, E.L., Capitanio, J.P., Leibel, R., Deng, L., LeDuc, C., Haghghi, F., Mann, J.J. Epigenetic regulation of serotonin transporter expression and behavior in infant rhesus macaques. *Genes, Brain, and Behavior*, 2010, 9, 575-582. PMC2921011
59. Hinde, K., Capitanio, J.P. Lactational programming? Mother's milk energy predicts infant behavior and temperament in rhesus macaques. *American Journal of Primatology*, 2010, 71, 1-8. PMC3377500.

60. Kinnally, E.L., Tarara, E.R., Mason, W.A., Mendoza, S.P., Abel, K., Lyons, L.A., Capitanio, J.P. Serotonin transporter expression is predicted by early life stress and is associated with disinhibited behavior in infant rhesus macaques. *Genes, Brain, and Behavior*, 2010, 9, 45-52. PMC2823956.
61. Goto, K., Fukuda, K., Senda, A., Saito, T., Kimura, K., Glander, K.E., Hinde, K., Dittus, W., Milligan, L.A., Power, M.L., Oftedal, O.T., Urashima, T. Chemical characterization of oligosaccharides in the milk of six species of New and Old World monkeys. *Glycoconj J.*, 2010, 27, 703-15. PMC3002168.
62. Kinnally, E.L., Karere, G.M., Lyons, L.A., Mendoza, S.P., Mason, W.A., Capitanio, J.P. Serotonin pathway gene-gene and gene-environment interactions influence behavioral stress response in infant rhesus macaques. *Development and Psychopathology*, 2010, 22, 35-44. PMC3170845.
63. Karere, G.M., Kinnally, E.L., Sanchez, J.N., Famula, T.R., Lyons, L.A., Capitanio, J.P. What is an "adverse" environment? Interactions of rearing experiences and MAOA genotype in rhesus monkeys. *Biological Psychiatry*, 2009, 65, 770-777. PMC2688474.
64. Hinde, K., Power, M.L., Oftedal, O.T. Rhesus macaque milk: magnitude, sources, and consequences of individual variation over lactation. *Am J Phys Anthropol.*, 2009, 138, 148-57. PMC2615798.
65. Golub, M.S., Hogrefe, C.E., Widaman, K.F., Capitanio, J.P. Iron deficiency anemia and affective response in rhesus monkey infants. *Developmental Psychobiology*, 2009, 51, 47-59. PMC3443197.
66. Weinstein, T.A.R., Capitanio, J.P. Individual differences in infant temperament predict social relationships of yearling rhesus monkeys (*Macaca mulatta*). *Animal Behaviour*, 2008, 76, 455-465. PMC3592560.
67. Kinnally, E.L., Lyons, L.A., Abel, K., Mendoza, S.P., Capitanio, J.P. Effects of early experience and genotype on serotonin transporter regulation in infant rhesus macaques. *Gene, Brains, and Behavior*, 2008, 7, 481-486. PMC18081711.
68. Goursaud, A-P.S., Mendoza, S.P., Capitanio, J.P. Do neonatal bilateral ibotenic acid lesions of the hippocampal formation or of the amygdala impair HPA axis responsiveness and regulation in infant rhesus macaques (*Macaca mulatta*)? *Brain Research*, 2006, 1071, 97-104.

69. Golub, M.S., Hogrefe, C.E., Germann, S.L., Capitanio, J.P., Lozoff, B. Behavioral consequences of developmental iron deficiency in infant rhesus monkeys. *Neurotoxicology and Teratology*, 2006, 28, 3-17. PMC1540448.
70. Capitanio, J.P. Hematology and serum chemistry reference values for rhesus macaque (*Macaca mulatta*) infants. Pp. 577-581 in G.P. Sackett, G. Ruppenthal, K. Elias (Eds.), Nursery Rearing of Nonhuman Primates in the 21st Century. New York: Springer, 2006.
71. Capitanio, J.P., Mason, W.A., Mendoza, S.P., Del Rosso, L.A., Roberts, J.A. Nursery rearing and biobehavioral organization. Pp. 191-213 in G.P. Sackett, G. Ruppenthal, K. Elias (Eds.), Nursery Rearing of Nonhuman Primates in the 21st Century. New York: Springer, 2006.
72. Capitanio, J.P., Mendoza, S.P., Mason, W.A., Maninger, N. Rearing environment and hypothalamic-pituitary-adrenal regulation in young rhesus monkeys (*Macaca mulatta*). *Developmental Psychobiology*, 2005, 46, 318-330.