Product 60010 mNSET™ (Non-Surgical Embryo & Sperm Transfer) Device for Mice Publications

About NSET Use References

Targeted genetic editing in embryos is being used for precision alterations in mouse and rat genomes for generation of specific disease and physiological models for biomedical research. Once an embryo has been altered, it must be returned to an appropriate recipient female to develop to term, leading to characterization of founder mice. Historically, embryo transfer in rodents has been performed surgically (SET). In order to minimize the potential for surgical complications, the need for anesthesia and analgesia, and simplify the procedures required to support laboratory animal research, devices and methods that enable non-surgical embryo transfer (NSET) into pseudopregnant female rodents have been developed. The first device was developed for non-surgical embryo transfer in mice (**mNSET device 60010**) (Green et al., 2009).

The mNSET 60010 device has been used to transfer blastocysts at numerous research institutions. When the mNSET device is specifically mentioned in any published article, the category reference for its use can be found below. However, not all uses are mentioned in publications. Use of the device for vivarium maintenance or veterinary purposes (not research related) may not be reported in the literature. Specifically, the device is used regularly for rederivation to remove pathogens from strains imported into a new facility or from mouse colonies with a compromised health status. Please find listed below references for mNSET use by category, full reference and links to the articles are provided.

Embryo Transfer:

Albers RE, Kaufman MR, Natale BV, Keoni C, Kulkarni-Datar K, Min S, Williams CR, Natale DRC, Brown TL (2019) Trophoblast-Specific Expression of Hif-1α Results in Preeclampsia-Like Symptoms and Fetal Growth Restriction. Sci Rep. 9(1):2742. doi: 10.1038/s41598-019-39426-5. PMID: 30808910; PMCID: PMC6391498. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6391498/

Bin Ali R, van der Ahé F, Braumuller TM, Pritchard C, Krimpenfort P, Berns A, Huijbers IJ (2014) Improved pregnancy and birth rates with routine application of nonsurgical embryo transfer. Transgenic Res 23(4):691-5. PMID: 24798251; PMCID: PMC4053600.https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4167466/

Bulut-Karslioglu A, Biechele S, Jin H, Macrae TA, Hejna M, Gertsenstein M, Song JS, Ramalho-Santos M (2016) Inhibition of mTOR induces a paused pluripotent state. Nature 540(7631):119-123. doi: 10.1038/nature20578. PMID: 27880763; PMCID: PMC5143278. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5143278/

Choi ES, Kawano K, Hiraya M, Matsukawa E, Yamada M (2019) Effects of pyruvate and dimethyl-α-ketoglutarate, either alone or in combination, on pre- and post-implantation development of mouse zygotes cultured in vitro. Reprod Med Biol 18(4):405-410. doi: 10.1002/rmb2.12288. PMID: 31607802; PMCID: PMC6780036. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6780036/

de Waal E, Mak W, Calhoun S, Stein P, Ord T, Krapp C, Coutifaris C, Schultz RM, Bartolomei MS (2014) In vitro culture increases the frequency of stochastic epigenetic errors at imprinted genes in placental tissues from mouse concepti produced through assisted reproductive technologies. Biol Reprod 90(2):22. doi: 10.1095/biolreprod.113.114785. PMID: 24337315; PMCID: PMC4076403.https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4076403/

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Embryo Transfer continued:

de Waal E, Vrooman LA, Fischer E, Ord T, Mainigi MA, Coutifaris C, Schultz RM, Bartolomei MS (2015) The cumulative effect of assisted reproduction procedures on placental development and epigenetic perturbations in a mouse model. Hum Mol Genet 24(24):6975-85. doi: 10.1093/hmg/ddv400. PMID: 26401051; PMCID: PMC4654053. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4654053/

Green MA, Bass S, Spear BT (2009) A device for the simple and rapid transcervical transfer of mouse embryos eliminates the need for surgery and potential post-operative complications. Biotechniques. 47:919-924. doi: 10.2144/000113257. PMID:20041845; PMCID: PMC4506771. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4506771/

Huang CH, Chan WH (2017) Rhein induces oxidative stress and apoptosis in mouse blastocysts and has immunotoxic effects during embryonic development. Int J Mol Sci 18(9):2018. doi: 10.3390/ijms18092018. PMID: 28930172; PMCID: PMC5618666. https://www.mdpi.com/1422-0067/18/9/2018

Huang CH, Chan WH (2017) Protective effects of liquiritigenin against citrinin-triggered, oxidative-stress-mediated apoptosis and disruption of embryonic development in mouse blastocysts. Int J Mol Sci 18(12):2538. doi: 10.3390/ijms18122538. PMID: 29186930; PMCID: PMC5751141. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5751141/

Jimenez R, Melo EO, Davydenko O, Ma J, Mainigi M, Franke V, Schultz RM (2015) Maternal SIN3A regulates reprogramming of gene expression during mouse preimplantation development. Biol Reprod 93(4):89. doi: 10.1095/biolreprod.115.133504. PMID: 26353893; PMCID: PMC4711907. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4711907/

Karimi H, Mahdavi P, Fakhari S, Faryabi MR, Esmaeili P, Banafshi O, Mohammadi E, Fathi F, Mokarizadeh A (2017) Altered helper T cell-mediated immune responses in male mice conceived through in vitro fertilization. Reprod Toxicol 69:196-203. doi: 10.1016/j.reprotox.2017.03.005. PMID: 28284725.https://europepmc.org/abstract/med/28284725

Kaufman MR, Albers RE, Keoni C, Kulkarni-Datar K, Natale DR, Brown TL (2014) Important aspects of placental-specific gene transfer. Theriogenology 82(7):1043-8. doi: 10.1016/j.theriogenology.2014.07.010. PMID: 25110063; PMCID: PMC4167466. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4167466/

Mainigi MA, Olalere D, Burd I, Sapienza C, Bartolomei M, Coutifaris C (2014) Peri-implantation hormonal milieu: elucidating mechanisms of abnormal placentation and fetal growth. Biol Reprod 90(2):26. doi: 10.1095/biolreprod.113.110411. PMID: 24352558; PMCID: PMC4076405. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4076405/

Mainigi M, Rosenzweig JM, Lei J, Mensah V, Thomaier L, Talbot CC Jr, Olalere D, Ord T, Rozzah R, Johnston MV, Burd I. Peri-Implantation Hormonal Milieu: Elucidating Mechanisms of Adverse Neurodevelopmental Outcomes. Reprod Sci. 2016 Jun;23(6):785-94. doi: 10.1177/1933719115618280. Epub 2015 Nov 26. PMID: 26614264; PMCID: PMC5933150. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5933150/

Martin NP, Myers P, Goulding E, Chen SH, Walker M, Porter TM, Van Gorder L, Mathew A, Gruzdev A, Romeo C (2018) En masse lentiviral gene delivery to mouse fertilized eggs via laser perforation of zona pellucida. Transgenic Res 27(1):39-49. doi: 10.1007/s11248-017-0056-8. PMID: 29442214; PMCID: PMC5990369. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5990369/

McKenna J, Bellofiore N, Catt S, Pangestu M, Temple-Smith P (2020). A human-based assisted reproduction protocol for the menstruating spiny mouse, Acomys cahirinus. PLoS ONE 15(12): e0244411. https://doi.org/10.1371/journal.pone.0244411

Navarrete FA, Alvau A, Lee HC, Levin LR, Buck J, Leon PM, Santi CM, Krapf D, Mager J, Fissore RA, Salicioni AM, Darszon A, Visconti PE (2016) Transient exposure to calcium ionophore enables in vitro fertilization in sterile mouse models. Sci Rep 6:33589. doi: 10.1038/srep33589. PMID: 27627854; PMCID: PMC5024339. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5024339/

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Embryo Transfer continued:

Prasad P, Molla MR, Cui W, Canakci M, Osborne B, Mager J, Thayumanavan S (2015) Polyamide nanogels from generally recognized as safe components and their toxicity in mouse preimplantation embryos. Biomacromolecules 16(11):3491-8. doi: 10.1021/acs.biomac.5b00900. PMID: 26367020; PMCID: PMC4970214. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4970214/

Saben JL, Asghar Z, Rhee JS, Drury A, Scheaffer S, Moley KH (2016) Excess maternal fructose consumption increases fetal loss and impairs endometrial decidualization in mice. Endocrinology 157(2):956-68. doi: 10.1210/en.2015-1618. PMID: 26677880; PMCID: PMC4733112. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4733112/

Sepulveda-Rincon LP, Islam N, Marsters P, Campbell BK, Beaujean N, Maalouf WE (2017) Embryo cell allocation patterns are not altered by biopsy but can be linked with further development. Reproduction 154(6):807-814. doi: 10.1530/REP-17-0514. PMID: 28971891; PMCID: PMC5747100. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5747100/

Steele KH, Hester JM, Stone BJ, Carrico KM, Spear BT, Fath-Goodin A (2013) Nonsurgical embryo transfer device compared with surgery for embryo transfer in mice. J Am Assoc Lab Anim Sci 52(1):17-21. PMID: 23562028; PMCID: PMC3548196. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3548196/

Stone BJ (2020) Nonsurgical Embryo Transfer Protocol for Use with the NSET™ Device. Methods Mol Biol 2066:107-111. doi: 10.1007/978-1-4939-9837-1_9. PMID: 31512211. https://link.springer.com/protocol/10.1007%2F978-1-4939-9837-1_9

Tian X, Anthony K, Neuberger T, Diaz FJ (2014) Preconception zinc deficiency disrupts postimplantation fetal and placental development in mice. Biol Reprod 90(4):83. doi: 10.1095/biolreprod.113.113910. PMID: 24599289; PMCID: PMC4076385. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4076385/

Valachova B, Cubinkova I, Brezovakova V, Hanes J, Jadhav S (2019) Rederivation of transgenic rodent models expressing disease modified tau protein - a report. SJLAS 45(5):1-8. doi.org/10.23675/sjlas.v45i0.915. http://www.sjlas.org/index.php/SJLAS/article/view/915

Yoon J, Juhn KM, Yoon SH, Ko Y, Lim JH (2017) Effects of sperm insemination on the final meiotic maturation of mouse oocytes arrested at metaphase I after in vitro maturation. Clin Exp Reprod Med 44(1):15-21. doi: 10.5653/cerm.2017.44.1.15. PMID: 28428939; PMCID: PMC5395547. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5395547/

Zhang S, Mesalam A, Lee KL, Song SH, Khan I, Yuan Y, Wenfa LV, Kong IK (2019) Effect of Predator Stress on the Reproductive Performance of Female Mice After Nonsurgical Embryo Transfer. J Am Assoc Lab Anim Sci. 58(3):304-310. doi: 10.30802/AALAS-JAALAS-18-000085. PMID: 30971328; PMCID: PMC6526485. https://www.ncbi.nlm.nih.gov/pubmed/30971328

Sperm Transfer:

Avella MA, Baibakov B, Dean J (2014) A single domain of the ZP2 zona pellucida protein mediates gamete recognition in mice and humans. J Cell Biol 205(6):801-9. doi: 10.1083/jcb.201404025. PMID: 24934154; PMCID: PMC4068139. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4068139/

Lough-Stevens M, Ghione CR, Urness M, Hobbs A, Sweeney CM, Dean MD (2021) Biology of Reproduction, 2021, 104(3), 684–694, Male-derived copulatory plugs enhance implantation success in female *Mus musculus*, https://doi.org/10.1093/biolre/ioaa228

Stone BJ, Steele KH, Fath-Goodin A (2015) A rapid and effective nonsurgical artificial insemination protocol using the NSET™ device for sperm transfer in mice without anesthesia. Transgenic Res 24(4):775-81. doi: 10.1007/s11248-015-9887-3. PMID:26065409; PMCID: PMC4504984. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4504984/

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Pathogen Transfer:

Chen J, Zhang H, Zhou Z, Yang Z, Ding Y, Zhou Z, Zhong E, Arulanandam B, Baseman J, Zhong G (2014) Chlamydial induction of hydrosalpinx in 11 strains of mice reveals multiple host mechanisms for preventing upper genital tract pathology. PLoS One 9(4):e95076. doi: 10.1371/journal.pone.0095076. PMID: 24736397; PMCID: PMC3988139. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3988139/

Coers J, Gondek DC, Olive AJ, Rohlfing A, Taylor GA, Starnbach MN (2011) Compensatory T cell responses in IRG-deficient mice prevent sustained *Chlamydia trachomatis* infections. PLoS Pathog 7(6):e1001346. doi: 10.1371/journal.ppat.1001346. PMID: 21731484; PMCID: PMC3121881. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3121881/

Davila SJ, Olive AJ, Starnbach MN (2014) Integrin α4β1 is necessary for CD4+ T cell-mediated protection against genital *Chlamydia trachomatis* infection. J Immunol 192(9):4284-93. doi: 10.4049/jimmunol.1303238. PMID: 24659687; PMCID: PMC3995848. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3995848/

Fischer A, Harrison KS, Ramirez Y, Auer D, Chowdhury SR, Prusty BK, Sauer F, Dimond Z, Kisker C, Hefty PS, Rudel T (2017) *Chlamydia trachomatis*-containing vacuole serves as deubiquitination platform to stabilize Mcl-1 and to interfere with host defense. Elife 6:e21465. doi: 10.7554/eLife.21465. PMID: 28347402; PMCID: PMC5370187. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5370187/

Gondek DC, Olive AJ, Stary G, Starnbach MN (2012) CD4+ T cells are necessary and sufficient to confer protection against *Chlamydia trachomatis* infection in the murine upper genital tract. J Immunol 189(5):2441-9. doi: 10.4049/jimmunol.1103032. PMID: 22855710; PMCID: PMC3690950. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3690950/

Karunakaran KP, Yu H, Jiang X, Chan Q, Moon KM, Foster LJ, Brunham RC (2015) Outer membrane proteins preferentially load MHC class II peptides: implications for a *Chlamydia trachomatis* T cell vaccine. Vaccine 33(18):2159-66. doi: 10.1016/j.vaccine.2015.02.055. PMID: 25738816; PMCID: PMC4390527. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4390527/

LaBrie SD, Dimond ZE, Harrison KS, Baid S, Wickstrum J, Suchland RJ, Hefty PS (2019) Transposon mutagenesis in *Chlamydia trachomatis* identifies CT339 as a ComEC homolog important for DNA uptake and lateral gene transfer. MBio 10(4):e01343-19. doi: 10.1128/mBio.01343-19. PMID: 31387908; PMCID: PMC6686042. https://pubmed.ncbi.nlm.nih.gov/31387908/

Nogueira CV, Zhang X, Giovannone N, Sennott EL, Starnbach MN (2015) Protective immunity against *Chlamydia trachomatis* can engage both CD4+ and CD8+ T cells and bridge the respiratory and genital mucosae. J Immunol 194(5):2319-29. doi: 10.4049/jimmunol.1402675. PMID: 25637024; PMCID: PMC4340718. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4340718/

Olive AJ, Gondek DC, Starnbach MN (2011) CXCR3 and CCR5 are both required for T cell-mediated protection against *C. trachomatis* infection in the murine genital mucosa. Mucosal Immunol 4(2):208-16. doi: 10.1038/mi.2010.58. PMID: 20844481; PMCID: PMC3010299. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3010299/

Ramsey KH, Schripsema JH, Smith BJ, Wang Y, Jham BC, O'Hagan KP, Thomson NR, Murthy AK, Skilton RJ, Chu P, Clarke IN (2014) Plasmid CDS5 influences infectivity and virulence in a mouse model of *Chlamydia trachomatis* urogenital infection. Infect Immun 82(8):3341-9. doi: 10.1128/IAI.01795-14. PMID: 24866804; PMCID: PMC4136204. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6686042/

Stary G, Olive A, Radovic-Moreno AF, Gondek D, Alvarez D, Basto PA, Perro M, Vrbanac VD, Tager AM, Shi J, Yethon JA, Farokhzad OC, Langer R, Starnbach MN, von Andrian UH (2015) VACCINES. A mucosal vaccine against *Chlamydia trachomatis* generates two waves of protective memory T cells. Science 348(6241):aaa8205. doi: 10.1126/science.aaa8205. PMID: 26089520; PMCID: PMC4605428. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4605428/

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Pathogen Transfer continued:

Tang L, Yang Z, Zhang H, Zhou Z, Arulanandam B, Baseman J, Zhong G (2014) Induction of protective immunity against *Chlamydia muridarum* intracervical infection in DBA/1j mice. Vaccine 32(12):1407-13. doi: 10.1016/j.vaccine.2013.10.018. PMID: 24188757; PMCID: PMC3943569. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3943569/

Tang L, Zhang H, Lei L, Gong S, Zhou Z, Baseman J, Zhong G (2013) Oviduct infection and hydrosalpinx in DBA1/j mice is induced by intracervical but not intravaginal inoculation with *Chlamydia muridarum*. PLoS One 8(8):e71649. doi: 10.1371/journal.pone.0071649. PMID: 23940777; PMCID: PMC3734308. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3734308/

Vicetti Miguel RD, Quispe Calla NE, Dixon D, Foster RA, Gambotto A, Pavelko SD, Hall-Stoodley L, Cherpes TL (2017) IL-4-secreting eosinophils promote endometrial stromal cell proliferation and prevent *Chlamydia*-induced upper genital tract damage. Proc Natl Acad Sci U S A 114(33):E6892-E6901. doi: 10.1073/pnas.1621253114. PMID: 28765368; PMCID: PMC5565408. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5565408/

Vicetti Miguel RD, Quispe Calla NE, Pavelko SD, Cherpes TL (2016) Intravaginal *Chlamydia trachomatis* challenge infection elicits TH1 and TH17 immune responses in mice that promote pathogen clearance and genital tract damage. PLoS One 11(9):e0162445. doi: 10.1371/journal.pone.0162445. PMID: 27606424; PMCID: PMC5015975. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5015975/

Yu H, Karunakaran KP, Jiang X, Brunham RC (2016) Subunit vaccines for the prevention of mucosal infection with *Chlamydia trachomatis*. Expert Rev Vaccines 15(8):977-88. doi: 10.1586/14760584.2016.1161510. PMID: 26938202; PMCID: PMC4981183. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4981183/

Zhang T, Huo Z, Ma J, He C, Zhong G (2019) The plasmid-encoded pGP3 promotes *Chlamydia* evasion of acidic barriers in both stomach and vagina. Infect Immun 87(5):e00844-18. doi: 10.1128/IAI.00844-18. PMID: 30858342; PMCID: PMC6479032. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6479032/

Zhang Y, Shao L, Li X, Zhong G (2017) Uterotubal junction prevents chlamydial ascension via innate immunity. PLoS One 12(8):e0183189. doi: 10.1371/journal.pone.0183189. PMID: 28797102; PMCID: PMC5552320. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5552320/

Material Transfer:

Armstrong GM, Maybin JA, Murray AA, Nicol M, Walker C, Saunders PTK, Rossi AG, Critchley HOD (2017) Endometrial apoptosis and neutrophil infiltration during menstruation exhibits spatial and temporal dynamics that are recapitulated in a mouse model. Sci Rep 7(1):17416. doi: 10.1038/s41598-017-17565-x. PMID: 29234102; PMCID: PMC5727295. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5727295/

Barrette VF, Adams MA, Croy BA (2012) Endometrial decidualization does not trigger the blood pressure decline of normal early pregnancy in mice. Biol Reprod 86(3):66. doi: 10.1095/biolreprod.111.096958. PMID: 22156477; PMCID: PMC3380067. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3380067/

Cousins FL, Murray A, Esnal A, Gibson DA, Critchley HO, Saunders PT (2014) Evidence from a mouse model that epithelial cell migration and mesenchymal-epithelial transition contribute to rapid restoration of uterine tissue integrity during menstruation. PLoS One. 9(1):e86378. doi: 10.1371/journal.pone.0086378. PMID: 24466063; PMCID: PMC3899239. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3899239/https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3899239/

Li S, Garcia M, Gewiss RL, Winuthayanon W (2017) Crucial role of estrogen for the mammalian female in regulating semen coagulation and liquefaction in vivo. PLoS Genet 13(4):e1006743. doi: 10.1371/journal.pgen.1006743. PMID: 28414719; PMCID: PMC5411094. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5411094/

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Video Links:

Lab Animal Sciences 2014 by Dr. Barbara Stone, Director of NSET Technology, ParaTechs Corporation, C.E. Credits: CE. https://www.labroots.com/webinar/the-future-of-mouse-embryo-transfer-achieving-the-3rs-with-the-nset-device

Moreno-Moya JM, Ramírez L, Vilella F, Martínez S, Quinonero A, Noguera I, Pellicer A, and Simon C (2014) Complete method to obtain, culture, and transfer mouse blastocysts nonsurgically to study implantation and development. *Fertility and Sterility Forum*. https://www.ncbi.nlm.nih.gov/pubmed/24355048

Stone B, ParaTechs Corporation. mNSET (Non-Surgical Embryo Transfer) Device for Mice 60010 Full Demonstration and Quick Procedure Video (2019) https://youtu.be/eQ4LuKNXQtw

Stone B, ParaTechs Corporation. mNSET (Non-Surgical Embryo Transfer) Device for Mice 60010 Quick Procedure Demonstration Video (2019) https://youtu.be/ItFo8zacPnw

Animal Welfare Review:

Ormandy EH, Dale J, Griffin G (2011) Genetic engineering of animals: ethical issues, including welfare concerns. Can Vet J 52(5):544-50. PMID: 22043080; PMCID: PMC3078015. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3078015/

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