MOLECULAR SIGNATURE®

DNA Damage (8-OHdG) ELISA kit

Colorimetric detection of 8-hydroxy-2-deoxy Guanosine
Catalog No. SKT-120

StressMarq Biosciences INC.

Discovery through partnership | Excellence through quality

Product Name

DNA Damage (8-OHdG) ELISA kit

Description

Colorimetric detection of 8-hydroxy-2-deoxy Guanosine

Species Reactivity

Species Independent

Platform

Microplate

Sample Types

Cell lysates, Plasma, Sample matrices, Urine

Detection Method

Colorimetric Assay

Assay Type

Competitive ELISA (Enzyme-linked Immunosorbent Assay)

Utility

ELISA Kit for 8-OHdG detection in samples.

Sensitivity

0.59 ng/mL

Assay Range

0.94 - 60 ng/mL

Precision

Intra-Assay Precision: Three samples of known concentration were assayed thirty times on one plate; the intra-assay coefficient of variation of the DNA Damage ELISA has been determined to be <5%. Inter-Assay Precision: Three samples of known concentration were assayed thirty times in three individual assays; the inter-assay coefficient of variation of the DNA Damage ELISA has been determined to be <5%.

Incubation Time

1 hour

Number Of Samples

39 samples in duplicate

Other Resources

Kit Booklet , MSDS , Calculations Worksheet

Field Of Use

Not for use in humans. Not for use in diagnostics or therapeutics. For in vitro research use only.

Properties

Storage Temperature

4ºC and -20ºC

Shipping Temperature

Blue Ice

Product Type

ELISA Kits

Specificity

Cross-reactivity: 8-Hydroxy-2-deoxy Guanosine (8-OHdG): 100%. 8-Hydroxy Guanosine (8-OHG): 23%. 8-Hydroxy Guanine (8-oxoG): 23%. Guanosine: <0.01%.

Assay Overview

1. Prepare standard and samples in the Sample and Standard Diluent. 2. Add 50 µL of prepared standards and samples in triplicate to appropriate wells. 3. Add 50 µL of the diluted antibody preparation to the appropriate wells. 4. Cover plate with Plate Cover and incubate at room temperature (20-25°C) for 1 hour. 5. Wash plate 4 times with 1X Wash Buffer. 6. Add 100 µL of TMB Substrate to each well. 7. Cover plate and develop the plate in the dark at room temperature for 30 minutes. 8. Add 100 µL of Stop Solution to each well. 9.

Measure absorbance on a plate reader at 450 nm. 10. Plot the standard curve and calculate sample concentrations.

Kit Overview

Component No.	Item	Quantity / Size
SKC-120A	8-hydroxy-2-deoxy Guanosine : BSA Coated Plate	1 Plate
SKC-120C	8-hydroxy-2-deoxy Guanosine Standard	1 vial/ 100uL
SKC-120F	8-hydroxy-2-deoxy Guanosine HRP Conjugated Monoclonal Antibody	1 vial/75uL
SKC-0001	Sample and Standard Diluent	1 vial/50mL
SKC-0002	8-hydroxy-2-deoxy Guanosine Antibody Diluent	1 vial/13mL
SKC-0003	Wash Buffer Concentrate	1 vial/50mL
SKC-0004	TMB Substrate	1 vial/13mL

SKC-0005
Stop Solution
1 vial/13mL
SKC-0009
Plate Cover
2 covers

Cite This Product

DNA Damage (8-OHdG) ELISA Kit (StressMarq Biosciences Inc., Victoria BC CANADA, Catalog # SKT-120)

Biological Description

Alternative Names

8-OH-dG ELISA Kit, 8OHG ELISA Kit, 80G ELISA Kit, 8 hydroxyguanine ELISA Kit, 8-OHdG ELISA Kit, DNA Damage ELISA Kit

Research Areas

Cancer, Cell Signaling, Oxidation, Oxidative Stress, Post-translational Modifications

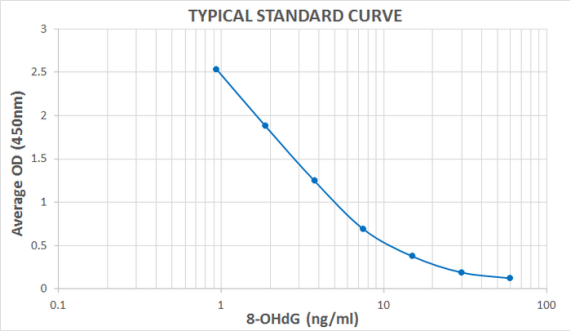
Scientific Background

8-hydroxy-2-deoxy Guanosine (8-OH-dG) is produced by the oxidative damage of DNA by reactive oxygen and nitrogen species and serves as an established marker of oxidative stress (1-4). Hydroxylation of guanosine occurs in response to both normal metabolic processes and a variety of environmental factors (i.e., anything that increases reactive oxygen and nitrogen species). Increased levels of 8-OH-dG are associated with the aging process as well as with a number of pathological conditions including cancer, diabetes, and hypertension(5-9). In complex samples such as plasma, cell lysates, and tissues, 8-OH-dG can exist as either the free nucleoside or incorporated in DNA. Once the blood enters the kidney, free 8-OH-dG is readily filtered into the urine, while larger DNA fragments remain in the bloodstream. Because of the complexity of plasma samples, urine is a more suitable matrix for the measurement of free 8-OH-dG than plasma. Urinary levels of 8-OH-dG range between 2.7-13 ng/mg creatine, while plasma levels of free 8-OH-dG have been reported to be between 4-21 pg/ml as determined by LC-MS (10-11).

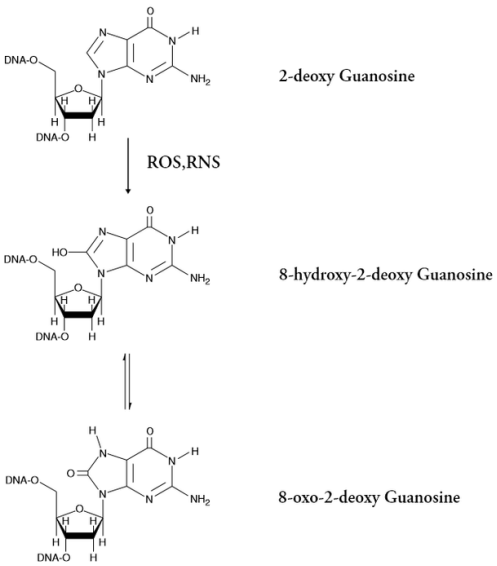
References

1. Maxey K.M., Maddipati K.R., Birkmeier J. (1992) J Clin Immunoassay 15: 116-120.
2. Pradelles P., Grassi J., Maclouf J. (1990) Methods Enzymol. 187: 24-34.
3. Maclouf J., Grassi J., Pradelles P. (1987) Dev Immunoassay Tech Meas eicosanoids.
4. Lin H., et al. (2004) Biochem J. 380: 541-548.
5. Bogdanov M.B., et al. (1999) Free Radic Biol Med. 27(5/6): 647-666.
6. Lee J., et al. (2005) Hypertension 45: 986-990.
7. Leinonen, J., et al. (1997) FEBSLett. 417: 150-152.
8. Endo K., et al. (2006) J. Atheroscler. Thromb. 13:68-75.
9. Kuo H., et al. (2007) Mutat Res. 631:62-68.
10. Shen J., et al. (2007) Cancer 109: 574-580.
11. Beckman K.B., Ames B.N. (1997) J Biol Chem 272: 19633-19636.
12. Epe B., et al. (1996) Nucleic Acids Res 24: 4105-4110.
13. Spencer J.P.E., et al. (1995) FEBS Lett 374: 233-236.
14. Floyd R.A. (1990) FASEB J 4: 2587-2597.

Product Images



Typical Standard Curve for the DNA Damage (8-OHdG) ELISA kit (Enzyme-Linked Immunosorbent Assay) StressXpress® – SKT-120. Assay Type: Competitive ELISA. Detection Method: Colorimetric Assay. Assay Range: 0.94 – 60 ng/ml.



Chemical Equation of the Oxidation of Guanosine

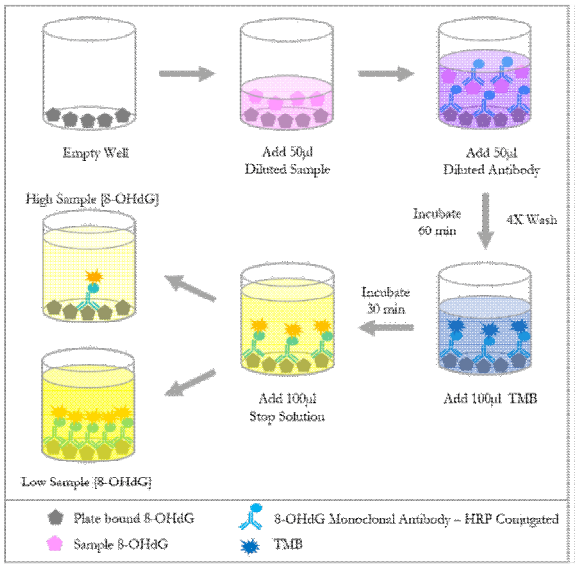
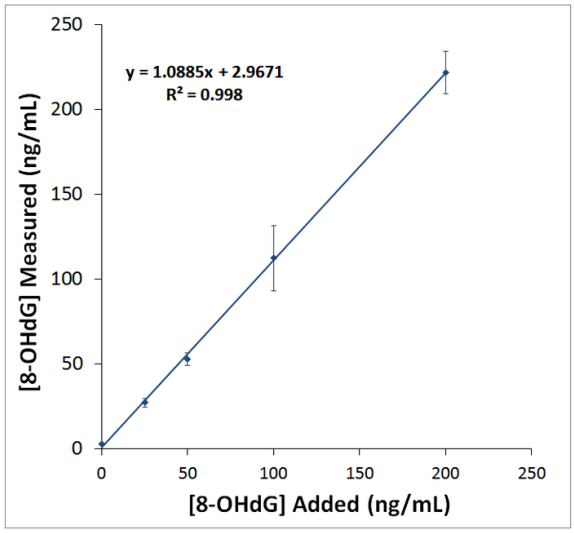


Diagram of the 8-OHdG Competitive ELISA



Urine Spike Assay

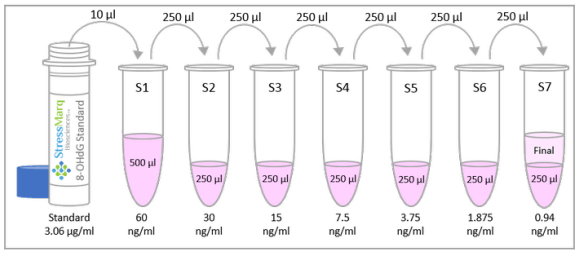


Diagram of the Preparation of the 8-OHdG Standards

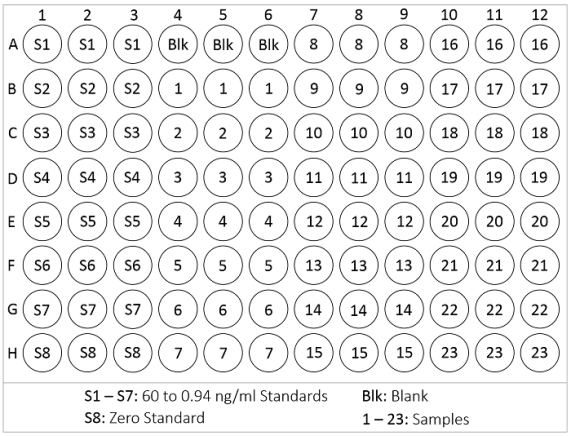
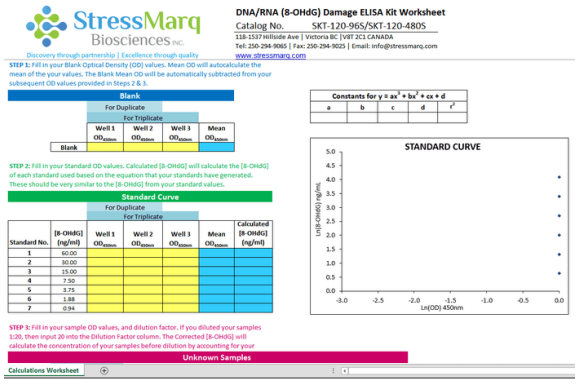


Diagram of the Triplicate Sample Plate Format



Preview of the Calculations Worksheet

Product Citations (53)

Other Citations

Association of serum total bilirubin and plasma 8-OHdG in HIV/AIDS patients

Kolgiri, V., Nagar, V. and Patil, V. (2018) Interventional Medicine and Applied Science [Epub ahead of print].

PubMed ID: N/A **Reactivity:** Human **Applications:** Blood

The biological age linked to oxidative stress modifies breast cancer aggressiveness.

Saez Freire, M.D.M. et al. (2018) Free Radic Biol Med. [Epub ahead of print].

PubMed ID: 29550329 **Reactivity:** Mouse **Applications:** Liver

SOCS1-targeted therapy ameliorates renal and vascular oxidative stress in diabetes via STAT1 and PI3K inhibition.

Lopez-Sanz, L. et al. (2018) Lab Invest. [Epub ahead of print].

PubMed ID: 29540859 **Reactivity:** Mouse **Applications:** Blood and urine

Effects of ozone repeated short exposures on the airway/lung inflammation, airway hyperresponsiveness and mucus production in a mouse model of ovalbumin-induced asthma.

Bao, W. et al. (2018) Biomed Pharmacother. [Epub ahead of print].

PubMed ID: 29499403 **Reactivity:** Mouse **Applications:** Lung

Ginsenoside Rb1 prevents high glucose-induced Schwann cell injury through the mitochondrial apoptosis pathway.

Li, X. et al. (2018) J Tradit Chin Med. 37(6): 746-755.

PubMed ID: N/A **Reactivity:** Rat **Applications:** Schwann cells

Urinary 8-hydroxydeoxyguanosine is a better biomarker of aging in non-smokers.

Zhao, Z.X. et al. (2018) Tradit. Med. Mod. Med.

PubMed ID: N/A **Reactivity:** Human **Applications:** Urine

IL-6 receptor blockade ameliorates diabetic nephropathy via inhibiting inflammasome in mice.

Wu, R. et al. (2018) Metabolism. [Epub ahead of print].

PubMed ID: 29336982 **Reactivity:** Mouse **Applications:** Urine

Analysis of Oxidative DNA Damage in HIV-Positive Pregnant Women.

Rajekar, R.B. (2017) IJIRMS. 02(10):2455-8737.

PubMed ID: N/A **Reactivity:** Human **Applications:** Plasma

Gene expression, oxidative stress and senescence of primary coronary endothelial cells exposed to postprandial serum of healthy adult and elderly volunteers after oven cooked meat meals.

Laura, C. et al. (2017) Mediators Inflamm. [Epub ahead of print].

PubMed ID: N/A **Reactivity:** Human **Applications:** HCAECs

A multi-biomarker analysis of the antioxidant efficacy of Parkinson's disease therapy.

Colamartino, M. et al. (2017) Toxicol In Vitro. 47:1-7.

PubMed ID: 29080800 **Reactivity:** Human **Applications:** buffy coat

Association of Metabolic Syndrome and Oxidative DNA Damage in HIV/AIDS Patients.

Kolgiri, V., Nagar, V. and Patil, V. (2017) Ind J Clin Biochem. 1669:18-26.

PubMed ID: 28535982 **Reactivity:** Human **Applications:** Plasma

Antiretroviral Therapy-induced Insulin Resistance and Oxidative Deoxy Nucleic Acid Damage in Human Immunodeficiency Virus-1 Patients.

VK Honnapurmath, V.W.P. (2017) Indian J Endocr Metab. 21(2):316-321.

PubMed ID: 28459032 **Reactivity:** Human **Applications:** Blood

Urinary excretion of uric acid, allantoin, and 8-OH-Deoxyguanosine in uricase-knockout mice.

Inazawa, K. et al. (2016) Nucleosides Nucleotides Nucleic Acids. 35(10-12):559-565.

PubMed ID: 27906613 **Reactivity:** Mouse **Applications:** Urine

Protein carbonyl content: a novel biomarker for aging in HIV/AIDS patients.

Kolgiri, V. and Patil, V.W. (2016) Braz J Infect Dis. pii: S1413-8670(16)30432-9.

PubMed ID: 27821249 **Reactivity:** Human **Applications:** Plasma

Coagulin-I ameliorates TLR4 induced oxidative damage and immune response by regulating mitochondria and NOX-derived ROS.

Reddy, SS (2016) Toxicol Appl Pharmacol. 309:87-100.

PubMed ID: 27568862 **Reactivity:** Mouse **Applications:** Liver homogenates

Preventive Effect of Resveratrol against Brain Mitochondria DNA Damage, Lipid Peroxidation, Inflammation and Seizures Induced by Kainic Acid in Mice.

Hussein, S. A., Abdel-mageid, A.D., Abd-Elhamed, O. M., Amin, A. and Al harthy, H.S. (2016) Int J Phar Sci. 6(4): 1634-1646.

PubMed ID: N/A **Reactivity:** Mouse **Applications:** Brain tissue

Neuroprotective Effect of Curcumin on Kainic Acid Model of Epilepsy in Male Swiss

Albino Mice.

Hussein, S. A., Abdel-mageid, A.D., Abd-Elhamed, O. M., Amin, A. and Al harthy, H.S. (2016) Int J Chem Nat Sci. 4(4): 447-460.

PubMed ID: N/A **Reactivity:** Mouse **Applications:** Brain tissue

DNA damage and the activation of the p53 pathway mediate alterations in metabolic and secretory functions of adipocytes.

Vergoni, B. et al. (2016) Diabetes.

PubMed ID: 27388216 **Reactivity:** Human **Applications:** Adipocytes

Discovering biomarkers for antidepressant response: protocol from the Canadian biomarker integration network in depression (CAN-BIND) and clinical characteristics of the first patient cohort.

Lam, R.W. et al. (2016) BMC Psychiatry. 16(1):105.

PubMed ID: 27084692 **Reactivity:** Human **Applications:** Bloot and Urine

Podocyte-specific Nox4 deletion affords renoprotection in a mouse model of diabetic nephropathy.

Jha, J.C. et al. (2015) Diabetologia. 59(2):379-89.

PubMed ID: 26508318 **Reactivity:** Mouse **Applications:** Urine

Does chronic raise of metal ion levels induce oxidative DNA damage and hypoxia-like response in patients with metal-on-metal hip resurfacing?

Savarino, L. et al. (2015) J Biomed Mater Res B Appl Biomater. 105(2):460-466.

PubMed ID: 26477446 **Reactivity:** Human **Applications:** Serum

Higher urinary Levels of 8-hydroxy-2'-deoxyguanosine are associated with a worse RANKL/OPG ratio in postmenopausal women with osteopenia.

Cervellati, C. et al. (2015) Oxid Med Cell Long. 2016:6038798.

PubMed ID: 26635910 **Reactivity:** Human **Applications:** Urine

Turmerone enriched standardized Curcuma longa extract alleviates LPS induced inflammation and cytokine production by regulating TLR4–IRAK1–ROS–MAPK –NFκB axis.

Rana, M. et al. (2015) J Functional Foods. 16 (2015): 152–163.

PubMed ID: N/A **Reactivity:** Mouse **Applications:** Liver homogenates

Synthesis, characterization and biological activity of some unsymmetrical Schiff base transition metal complexes.

Esmadi, F.T. et al. (2015) Drug Chem Toxicol. :1-7.

PubMed ID: 25791998 **Reactivity:** Human **Applications:** Lymphocytes

Late-intervention study with ebselen in an experimental model of type 1 diabetic nephropathy.

Tan, S.M., Sharma, A., Stefanovic, N. and de Haan, J.B. (2015) Free Radic Res. 49(3):219-27.

PubMed ID: 25465090 **Reactivity:** Mouse **Applications:** Urine

Immediate and delayed effects of growth conditions on ageing parameters in nestling zebra finches.

Reichert, S. et al. (2015) J Exp Biol. 218(Pt 3):491-9.

PubMed ID: 25524985 **Reactivity:** Zebra finch **Applications:** Blood cells

A derivative of Bardoxolone methyl, dh404, in an inverse dose-dependent manner, lessens diabetes-associated atherosclerosis and improves diabetic kidney disease.

Tan, S. M., et al. (2014) Diabetes. 63(9):3091-103.

PubMed ID: 24740568 **Reactivity:** Mice **Applications:** Urine

Elevation impacts the balance between growth and oxidative stress in coal tits.

Stier, A., et al. (2014) Oecologia. 175(3):791-800.

PubMed ID: 24805201 **Reactivity:** Bird (coal tits) **Applications:** Red blood cells

Evaluation of vitamin B12 effects on DNA damage induced by paclitaxel.

Alzoubi, K., Khabour O., Khader M., Mhaidat N. and Al-Azzam, S. (2014) Drug Chem Toxicol. 37(3):276-80.

PubMed ID: 24215581 **Reactivity:** Human **Applications:** Blood

Effect of Therapeutic Hypothermia on DNA Damage and Neurodevelopmental Outcome Among Term Neonates with Perinatal Asphyxia: A Randomized Controlled Trial.

Gane, B.D., et al. (2014) J Trop Pediatr. 60(2):134-40.

PubMed ID: 24343823 **Reactivity:** Human **Applications:** Blood

Disruption of pro-oxidant and antioxidant systems with elevated expression of the ubiquitin proteosome system in the cachectic heart muscle of nude mice.

Hinch, E. C. A., Sullivan-Gunn, M. J., Vaughan V. C., McGlynn M. A., Lewandowski, Paul A. (2013) J Cachexia Sarcopenia Muscle. 4(4):287-93.

PubMed ID: 24030522 **Reactivity:** Mouse **Applications:** Tumor tissue

Oxidative Damage of DNA Confers Resistance to Cytosolic Nuclease TREX1 Degradation and Potentiates STING-Dependent Immune Sensing.

Gehrke, N. et al. (2013) Immunity. 39(3):482-95.

PubMed ID: 23993650 **Reactivity:** Mouse **Applications:** RMA cells (T-cell tumor cells)

Differential effects of docosahexanoic acid (DHA) on preterm and term placental pro-oxidant/anti-oxidant balance.

Stark, M. et al. (2013) Reproduction. 146(3):243-51.

PubMed ID: 23813449 **Reactivity:** Human **Applications:** Placenta

The Modified Selenenyl Amide, M-hydroxy Ebselen, Attenuates Diabetic Nephropathy and Diabetes-Associated Atherosclerosis in ApoE/GPx1 Double Knockout Mice.

Tan, S.M., et al. (2013) PLoS ONE. 8(7): e69193.

PubMed ID: 23874911 **Reactivity:** Mouse **Applications:** Urine (diabetic and non-diabetic)

TiO2 Nanoparticle Exposure and Illumination during Zebrafish Development: Mortality at Parts per Billion Concentrations.

Bar-Ilan, O. et al. (2013) Environ Sci Technol. 47 (9): 4726-4733.

PubMed ID: 23510150 **Reactivity:** Zebrafish **Applications:** DNA extract

Poor sleep in PCOS; is melatonin the culprit?

Shreeve, N. et al. (2013) Hum Reprod. 28 (5): 1348-1353.

PubMed ID: 23438443 **Reactivity:** Human **Applications:** Urine

Grasshoppers' adaptation to elevated radioactivity in the Chernobyl exclusion zone.

Mortensen, L.H. (2013) Roskilde University Dissertation.

PubMed ID: N/A **Reactivity:** Grasshopper **Applications:** Intestines

Consumption of a low glycaemic index diet in late life extends lifespan of Balb/c mice with differential effects on DNA damage.

Nankervis, S.A., Mitchell, J.M., Charchar, F.J., McGlynn, M.A. and Lewandowski, P.A. (2013) Longev Healthspan. 2(1):4.

PubMed ID: 24472560 **Reactivity:** Mouse **Applications:** WBC's

Light-induced cell detachment for cell sheet technology.

Hong, Y. et al. (2013) Biomaterials. 34 (1): 11-18.

PubMed ID: 23069710 **Reactivity:** Mouse **Applications:** MC3T3-E1 cells

Puerarin prevents high glucose-induced apoptosis of Schwann cells by inhibiting oxidative stress.

Wu, Y., Xue, B., Li, X. and Liu, H. (2012) Neural Regen Res. 7 (33): 2583-2591.

PubMed ID: 25368634 **Reactivity:** Mouse **Applications:** Schwann cells

The protective effect of Alpha lipoic acid on Schwann cells exposed to constant or intermittent high glucose.

Sun, L. et al. (2012) Biochem Pharmacol. 84 (7): 961-973.

PubMed ID: 22796564 **Reactivity:** Mouse **Applications:** Schwann cells

Ginsenoside Rb1 relieves glucose fluctuation induced oxidative stress and apoptosis in Schwann cells.

Xue, B. et al. (2012) Neural Regen Res. 2012 (30): 2340-2346.

PubMed ID: 25538758 **Reactivity:** Mouse **Applications:** Schwann cells

Eicosapentaenoic Acid and Oxypurinol in the Treatment of Muscle Wasting in a Mouse Model of Cancer Cachexia.

Vaughan, V.C., Sullivan-Gunn, M., Hinch, E., Martin, P., Lewandowski, P.A. (2012) PLoS ONE. 7(9): e45900.

PubMed ID: 23029301 **Reactivity:** Mouse **Applications:** Gastrocnemius muscle

Titanium dioxide nanoparticles produce phototoxicity in the developing zebrafish.

Bar-Ilan, O. et al. (2012) Nanotoxicology. 6 (6): 670-679.

PubMed ID: 21830861 **Reactivity:** Zebrafish **Applications:** Embryos

Evaluation of vitamin B12 effects on DNA damage induced by pioglitazone.

Alzoubi, K., Khabour, O., Hussain, N., Al-azzam, S. and Mhaidat, N. (2012) Mutat Res. 748 (1-2): 48-51.

PubMed ID: 22790087 **Reactivity:** Human **Applications:** Blood

Protective Effects of Salvianolic Acid B on Schwann Cells Apoptosis Induced by High Glucose.

Sun, L. et al. (2012) Neurochemical Res. 37 (5): 996-1010.

PubMed ID: 22252725 **Reactivity:** Mouse **Applications:** Schwann cells

Oxidative Stress in HPV-Driven Viral Carcinogenesis: Redox Proteomics Analysis of

HPV-16 Dysplastic and Neoplastic Tissues.

De Marco, F. et al. (2012) PLoS ONE. 7(3): e34366.

PubMed ID: 22470562 **Reactivity:** Human **Applications:** Ecto-cervical tissue

Inhibitory effects of Salvianolic acid B on apoptosis of Schwann cells and its mechanism induced by intermittent high glucose.

Sun, L. et al. (2012) Life Sci. 90 (3-4): 99-108.

PubMed ID: 22036624 **Reactivity:** Mouse **Applications:** Schwann cells

A qPCR-based assay to quantify oxidized guanine and other FPG-sensitive base lesions within telomeric DNA.

O'Callaghan, N., Baack, N., Sharif, R. and French, M. (2011) Biotechniques. 51 (6): 403-411.

PubMed ID: 22150331 **Reactivity:** Human **Applications:** Spleen B lymphoblastoid cells

The effect of cocoa supplementation on hepatic steatosis, reactive oxygen species and LFABP in a rat model of NASH.

Janevski, M., Antonas, K.N., Sullivan-Gunn, M.J., McGlynn, M.A. and Lewandowski, P.A. (2011) Comp Hepatol. 10(1):10.

PubMed ID: 22081873 **Reactivity:** Rat **Applications:** Liver tissue

Reduction of Oxidative Damage Reflects a Better Kidney Transplantation Outcome.

La Manna, G. et al. (2011) Am J Nephrol. 34, 496-504.

PubMed ID: 22041478 **Reactivity:** Human **Applications:** PBMC

Integrated exposure assessment of sewage workers to genotoxicants: an urinary biomarker approach and oxidative stress evaluation.

Zabadi, H.A. et al. (2011) Environ Health. 10 (23).

PubMed ID: 21435260 **Reactivity:** Human **Applications:** Urine

Transgenic Mice Expressing Cyclooxygenase-2 in Hepatocytes Reveal a Minor Contribution of This Enzyme to Chemical Hepatocarcinogenesis.

Izquierdo, C.L. et al. (2011) Am J Pathol. 178 (3): 1361-1373.

PubMed ID: 21356386 **Reactivity:** Mouse **Applications:** COX-2 Tg cells

Reviews

Based on validation through cited publications.

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StressMarq Biosciences

January 17, 2017: