

Investigator(s):

Thomas B. Casale, Professor, Internal Medicine; Victoria M. Steelman, Ph.D. Candidate, College of Nursing; Rita Frantz, Associate Professor, College of Nursing

Project Title:

Prevalence and Risk Factors of Adverse Reactions to Products Containing Natural Rubber Among Nursing Staff

Year Funded:

1996

Amount Received:

\$15,000

Publications:

Victoria Steelman. Prevalence and Risk Factors of Adverse Reactions to Natural Rubber, Latex Among Nursing Personnel. Ph.D. Thesis, 1997.

Investigator(s):

Alan B. Moy, Assistant Professor, Internal Medicine

Project Title:

Development of an In Vitro Human Airway Model to Study LPS-Induced Airway Dysfunction

Year Funded:

1996

Amount Received:

\$15,000

Grant Awards:

Regulation of Lung Edema Based on a Tensegrity Paradigm. American Lung Association-Clinical Investigator Award. \$105,000

Regulation of Lung Edema Based on a Tensegrity Paradigm. NIH 1RO1HL60629. \$1,866,631.

Role of Endothelial Integrins on Inflammatory Edema. NIH 1RO1GM59734. \$1,525,964.

Investigator(s):

Raymond J. Hohl, Associate Professor, Internal Medicine; David M. Gustin, Post-doctoral Fellow, Internal Medicine

Project Title:

Abnormalities of RAS Expression in Noninvasive Bladder Carcinoma

Year Funded:

1996

Amount Received:

\$15,000

Publications:

Hohl RJ, Lewis RA, Cermak DM, Wiemer DF. Stereochemistry-dependent inhibition of RAS farnesylation by farnesyl phosphonic acids. *Lipids* 1998; 33(1):39-46.

Lewis KA, Hohl RJ. Modulation of RAS expression in human malignant cells by dietary supplements. *Nutrition* 1997; 13(10):921-923.

Grant Awards:

5M01RR000059-350859. R. Hohl, PI. High Dose Lovastatin for Treatment of RAS Oncogene Associated Malignancies, 1996. \$15,000

Investigator(s):

Vicki H. Grassian, Assistant Professor, Department of Chemistry

Project Title:

Reactions of Atmospheric Gases on Model Tropospheric Aerosols

Year Funded:

1996

Amount Received:

\$15,000

Publications:

Goodman AL, Miller TM, Grassian VH. Heterogeneous reactions of nitrogen dioxide on Al₂O₃ and NaCl particles. *J Vac Sci and Technology A* 1998; 16:2585-2590.

Miller TM, Grassian VH. Heterogeneous reactions of NO₂ on mineral oxide particles: spectroscopic evidence for oxide-coordinated and water-solvated surface nitrate. *Geophysical Research Letters* 1998; 25:3835-3838.

Todd Miller. Heterogeneous reactions of nitrogen oxides on metal oxide particles. Ph.D. Thesis, 1998.

Underwood, G. M., Miller, T. M. and Grassian, V.H. Transmission FT-IR and Knudsen Cell Study of the Heterogeneous Reactivity of Gaseous Nitrogen Dioxide on Mineral Oxide Particles *Journal of Physical Chemistry A* 1999, 103, 6184-6190..

Song, C. H.; Phadnis, M.; Carmichael, G. R.; Underwood, G. M.; Miller, T. M.; Balster, E. and Grassian, V. H. Modelling Heterogeneous Reactions in Air Pollution Models a Chapter in *Air Pollution VII*, pages 685-695, WIT Press South Hampton, Boston (1999). (Invited)

Goodman, A.L.; Underwood, G. M. and Grassian, V. H. A Spectroscopic Investigation of the Heterogeneous Reaction $2\text{NO}_2 + \text{H}_2\text{O}(\text{a}) \rightarrow \text{HONO}(\text{g}) + \text{HNO}_3(\text{a})$ on Hydrated Silica Particles: Characterization of Gas-Phase and Adsorbed Products *Journal of Physical Chemistry A* 1999, 103, 7217-7223.

Underwood, G. M.; Li, P.; Usher, C.; and Grassian V.H. Determining Accurate Kinetic Parameters of Potentially Important Heterogeneous Atmospheric Reactions on Solid Particle Surfaces Using a Knudsen Cell Reactor *Journal of Physical Chemistry A* 2000, 104, 819-829.

Goodman, A. L.; Underwood, and Grassian V.H. Laboratory Study of the Heterogeneous Reactions of HNO_3 on CaCO_3 Particles *J. Geophys. Res.- Atmospheres* 2000, 104, 29,053-29,064.

Al-Abadleh; H. A. and V. H. Grassian Heterogeneous Reaction of NO_2 on Hexane Soot: A Knudsen Cell and FT-IR Study *Journal of Physical Chemistry - A*. 2000, 104, 11926-11933.

Li, P.; Perreau, K. A.; Covington, E.; Carmichael, G. C.; Grassian, V. H. Heterogeneous Reactions of Volatile Organic Compounds on Oxide Particles of the Most Abundant Elements Present in the Earth's Crust: Surface Reactions of Acetaldehyde, Acetone and Propionaldehyde on SiO_2 , Al_2O_3 , Fe_2O_3 , TiO_2 and CaO *J. Geophys. Res.- Atmospheres*, 2001 ,106 , 5517-5529.

Underwood, G. M.; Song, C. H.; Phadnis, M.; Carmichael; G. C. and Grassian V.H. Heterogeneous Reactions of NO_2 and HNO_3 on Mineral Oxides and Mineral Dust: A Combined Laboratory and Modeling Study *J. Geophys. Res.- Atmospheres* t 2001, 106, 18055 -18066 (Invited submission to a special issue on mineral dust).

Grassian, V. H. Heterogeneous Uptake and Reaction of Nitrogen Oxides and Volatile Organic Compounds on the Surface of Atmospheric Particles Including Oxide, Carbonate, Soot and Mineral Dust: Implications for the Chemical Balance of the Troposphere. *International Reviews of Physical Chemistry* 2001, 20, 467-548. (Invited Review Article)

Goodman, A. L.; Li, P.; Usher, C.R.. and Grassian, V. H. Heterogeneous Reaction of Sulfur Dioxide on Aluminum and Magnesium Oxide Particles *Journal of Physical Chemistry A* 2001, 105, 6109 - 6120.

Goodman, A. L.; Bernard, E.B. and Grassian, V. H. A Spectroscopic Study of Nitric Acid and Water Adsorption on Oxide Particles: Enhanced Nitric Acid Uptake Kinetics in the Presence of Adsorbed Water *Journal of Physical Chemistry A* 2001, 105, 6443 - 6457.

Underwood, G. M., Li, P., Al-Abadleh, H. and Grassian V.H. A Knudsen Cell Study of the Heterogeneous Reactivity of Nitric Acid on Oxide and Mineral Dust Particles *Journal of Physical Chemistry A* 2001, 105, 6609-6620.

Li, P., Al-Abadleh, H. A. and Grassian, V. H. Measuring Heterogeneous Uptake on Solid Particle Surfaces with a Knudsen Cell Reactor: Complications Due to Surface Saturation and Gas Diffusion *Journal of Physical Chemistry A* 2002,106, 1210-1219.

Grassian, V. H. Chemical Reactions of Nitrogen Oxides on the Surface of Oxide, Carbonate, Soot and Mineral Dust Particles: Implications for the Chemical Balance of the Troposphere. Invited Feature Article in Journal of Physical Chemistry A 2002, 106, 860-877.

Usher, C. R., Al-Hosney, H., Carlos-Cuellar, S., and Grassian, V. H., Heterogeneous Uptake and Oxidation of SO₂ on Mineral Dust J. Geo. Res. - Atmospheres 2002 (DOI 10.1029/2002JD002051).

Michel, A. E.; Usher, C. R. and Grassian, V. H. Heterogeneous and Catalytic Uptake of Ozone on Mineral Oxides and Dust: A Knudsen Cell Investigation Geophys. Res. Letts. 2002 29, 10-1 to 10-4. (DOI 10.1029/2001GL014304).

Preszler Prince, A., J. Wade, J., Grassian, V. H., Kleiber, P. and Young, M. A., Heterogeneous Reactions of Soot Aerosols with Nitrogen Dioxide and Nitric Acid Studied in an Atmospheric Chamber Atmos. Env. 2002, 36, 5729-5740.

Al-Abadleh, H. A. and Grassian, V. H., FT-IR Study of Water Adsorption on Aluminum Oxide Surfaces Langmuir 2003, 19, 341-347.

Krueger, B. J., Grassian, V. H., Laskin, A. and Cowin, J. P., The Transformation of Solid Atmospheric Particles into Liquid Droplets through Heterogeneous Chemistry: Laboratory Insights into the Processing of Calcium Containing Mineral Dust Aerosol in the Troposphere Geophys. Res. Letts. 2003 30, 48-1 to 48-4. (DOI 10.1029/2002GL016563).

Carlos-Cuellar, S, Christensen, A.P., Burrichter, C., Li, P. and Grassian, V. H. Heterogeneous Uptake Kinetics of VOCs on Oxide Surfaces Using a Knudsen Cell Reactor: Adsorption of Acetic Acid, Formaldehyde and Methanol on α -Al₂O₃, SiO₂ and α -Fe₂O₃ J. Phys. Chem. A. 2003, 107, 4250-4261.

Michel, A. E., Usher, C. R. and Grassian, V. H. Reactive Uptake of Ozone on Mineral Oxides and Mineral Dusts Atmos. Env. 2003, 37, 3201-3211.

Krueger, B. J., Grassian, V. H., Iedema, M. J., Cowin, J. P. and Laskin, A. Probing Heterogeneous Chemistry of Individual Atmospheric Particles Using Scanning Electron Microscopy Analytical Chemistry 2003, 75, 5170-5179.

Usher, C. R., Michel, A. E., Stec, D. and Grassian, V. H., Laboratory Studies of Ozone Uptake on Processed Mineral Dust Atmos. Env. 2003, 37, 5337.

Al-Abadleh, H.A. Krueger, B.J., Ross, J. L. and Grassian, V. H., Phase Transitions in Calcium Nitrate Thin Films Chem. Comm., 2003, 2796- 2797.

Al-Abadleh, H. A. and V. H. Grassian Oxide Surfaces as Environmental Interfaces Surface Science Reports 2003, 52, 63-161 (Invited Review Article).

Usher, C. R., Michel, A. E. and Grassian, V. H. Reactions on Mineral Dust, Chemical Reviews 2003, 103, 4883 - 4940 (Invited Review Article).

Al-Hosney, H. A. and Grassian, V. H. Carbonic Acid: An Important Intermediate in the Surface Chemistry of Calcium Carbonate J. Am. Chem. Soc. 2004, 126, 8068-8069.

Krueger, B. J., Grassian, V. H., Laskin, A. and J. Cowin. Heterogeneous Chemistry of Individual Mineral Dust Particles from Different Dust Source Regions: The Importance of Particle Mineralogy Atmospheric Environment 2004, 38, 6253-6261.

Johnson, E. R. and Grassian, V. H. Environmental Catalysis of the Earth's Atmosphere: Heterogeneous Reactions on Mineral Dust Aerosol Environmental Catalysis, Ed. Vicki H. Grassian, CRC Publishing, Boca Raton, FL, 2005.

Al-Abadleh, H.A., Al-Hosney, H. A. and Grassian, V. H. Oxide and Carbonate Surfaces as Environmental Interfaces: The Importance of Water in Surface Composition and Surface Reactivity J. Molecular Catalysis A 2005, 228, 47-54.

Al-Hosney, H. A., Grassian, V. H. Water, Sulfur Dioxide and Nitric Acid Adsorption on Calcium Carbonate: A Transmission and ATR-FTIR Study. Physical Chemistry Chemical Physics 2005, 7, 1266 – 1276.

Laskin, A., Wietsma, T. W., Krueger, B. J., Grassian, V. H., Heterogeneous Chemistry of Individual Mineral Dust Particles with Nitric Acid. A Combined CCSEM/EDX, ESEM and ICP-MS Study. J. Geophys. Res. 2005, 110, D10208, doi:10.1029/2004JD005206, 1-15.

Baltrusaitas, J. and Grassian, V. H. Surface Reactions of Carbon Dioxide at the Adsorbed Water-Iron Oxide Interface J. Phys. Chem. B 2005, 109, 12227-12230.

Johnson, E. R., Sciegienka, J. Carlos-Cuellar, S and Grassian, V. H. Heterogeneous Uptake of Gaseous Nitric Acid on Dolomite ($\text{CaMg}(\text{CO}_3)_2$) and Calcite (CaCO_3) Particles: A Knudsen Cell Study Using Multiple, Single and Fractional Particle Layers Journal of Physical Chemistry A, 2005, 109, 6901-6911.

Al-Hosney, H. A., Carlos-Cuellar, S.; Baltrusaitis, J. and Grassian, V.H. Heterogeneous Uptake and Reactivity of Formic Acid on Calcium Carbonate Particles: A Knudsen Cell Reactor, FTIR and SEM Study Physical Chemistry Chemical Physics, 2005, 7, 3587 - 3595. (Cover Art)

Grant Awards:

A combined experimental and computational study of troposphere chemistry on aerosol surfaces. Department of Energy. \$473,000.

Postdoctoral opportunities in laboratory and modeling studies of environmental and atmospheric chemistry at the University of Iowa. Camille and Henry Dreyfus postdoctoral program in Environmental Chemistry. \$96,000.

Thermal and photo-assisted reactions on metal oxide particles. National Science Foundation. \$275,000.

Chemical Reactions of Environmental and Atmospheric Relevance on the Surface of Oxide Particles. (2000 - 2005) National Science Foundation. \$629,000. (PI: Vicki H. Grassian; note this includes a two-year creativity extension for \$275,000)

Chemical Reactions of Environmental and Atmospheric Relevance on Carbonate Surfaces. \$612,500. (2005-2009).National Science Foundation(PI: Vicki H. Grassian)

The role of heterogeneous chemistry in the photochemical oxidant cycle: a combined laboratory and modeling study. Dept. of Energy. \$640,824.

Investigator(s):

Joel N. Kline, Assistant Professor, Division of Pulmonary Medicine

Project Title:

Effects of CpG Oligonucleotides on a Murine Model of Eosinophilic Airways Inflammation

Year Funded:

1996

Amount Received:

\$15,000

Publications:

Kline JN, Waldschmidt TA, Businga TR, Lemish JE, Weinstock JV, Thorne PS, Krieg AM. Modulation of airway inflammation by CpG oligodeoxynucleotides in a murine model of asthma. *J Immunol* 1998; 160:2555-2559.

Ferguson JS, Kline JN. Tuberculosis: Emerging Role of DNA Vaccines. *Medscape*, In Press, 2004.

Kline JN, Krieg AM, Waldschmidt TJ, Ballas ZK, Jain V, Businga TR. CpG oligodeoxynucleotides do not require TH1 cytokines to prevent eosinophilic airway inflammation in a murine model of asthma. *J Allergy Clin Immunol.* 104(6):1258-64, 1999.

Kline JN. Effects of CpG DNA on Th1/Th2 Balance in Asthma. In: *Immunology of Bacterial CpG-DNA, Current Topics in Microbiology and Immunology*, H. Wagner Editor, Springer-Verlag. In Press, 2004.

Krieg AM, Kline JN. Immune effects and therapeutic applications of CpG motifs in bacterial DNA. *Immunopharmacology.* 48(3): 303-5, Jul 2000.

Kline JN. Effects of CpG DNA on Th1/Th2 balance in asthma. *Current Topics in Microbiology and Immunology.* 247: 211-25, 2000.

Kline JN, Kitagaki K, Businga TR, Jain VV. Treatment of established asthma in a murine model using CpG oligodeoxynucleotides. *American Journal of Physiology. Lung Cellular and Molecular Physiology.* 283(1): L170-9, Jul 2002.

Jain VV, Kitagaki K, Businga T, Hussain I, George C, O'shaughnessy P, Kline JN. CpG-oligodeoxynucleotides inhibit airway remodeling in a murine model of chronic asthma. *The Journal of Allergy and Clinical Immunology.* 110(6): 867-72, Dec 2002.

Hussain I, Kline JN. CpG oligodeoxynucleotides in asthma. *Current Opinion in Investigational Drugs (London, England : 2000).* 2(7): 914-8, Jul 2001.

Hussain I, Jain VV, Kitagaki K, Businga TR, O'Shaughnessy P, Kline JN. Modulation of murine allergic rhinosinusitis by CpG oligodeoxynucleotides. *The Laryngoscope*. 112(10): 1819-26, Oct 2002.

Kitagaki K, Jain VV, Businga TR, Hussain I, Kline JN. Immunomodulatory effects of CpG oligodeoxynucleotides on established th2 responses. *Clinical and Diagnostic Laboratory Immunology*. 9(6): 1260-9, Nov 2002.

Hussain I, Kline JN. CpG oligodeoxynucleotides: a novel therapeutic approach for atopic disorders. *Current Drug Targets. Inflammation and Allergy*. 2(3): 199-205, Sep 2003.

Jain VV, Kitagaki K, Kline JN. CpG DNA and immunotherapy of allergic airway diseases. *Clinical and Experimental Allergy : Journal of the British Society for Allergy and Clinical Immunology*.. 33(10): 1330-5, Oct 2003.

Jain VV, Businga TR, Kitagaki K, George CL, O'Shaughnessy PT, Kline JN. Mucosal immunotherapy with CpG oligodeoxynucleotides reverses a murine model of chronic asthma induced by repeated antigen exposure. *American Journal of Physiology. Lung Cellular and Molecular Physiology*. 285(5): L1137-46, Nov 2003.

Grant Awards:

Modulation of eosinophilic lung inflammation by CpG DNA. NIH, R01 HL 59324. \$350,000.

Effect of CpG DNA on asthma inflammatory response. American Lung Association Research Grant. \$50,000.

CpG Motifs in Plasmid DNA as Barrier to Gene Transfer. NIH 5M01RR000059-391044.