

# ABRAHAM NYSKA - CURRICULUM VITAE

Updated January 2023

## **Abraham Nyska, DVM, Diplomate ECVP, Fellow IATP**

Expert in Toxicologic Pathology  
Visiting Full Professor of Pathology  
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- *Expert in Toxicological Pathology,*
- *Doctorate of Veterinary Medicine (DVM),*
- *Diplomate of the European College of Veterinary Pathology (Dipl. ECVP),*
- *Fellow International Academy of Toxicologic Pathology (Fellow IATP)*
- *Visiting Full Professor of Veterinary Pathology (Tel Aviv University),*
- *Certification in Veterinary Anatomical Pathology*

## **DR. ABRAHAM NYSKA : SUMMARY OF BIOGRAPHY AND EXPERTISE:**

- Prof. Abraham Nyska is an expert in toxicologic pathology, holding two diplomas and formal recognition in toxicologic pathology, reflecting the highest recognition by the most highly-regarded international professional organizations. These formal professional recognitions are very relevant and important to the regulatory agencies.

### **1. Diplomate of the European College of Veterinary Pathologist (Board ECVP)**

<https://ebvs.eu/colleges/ECVP/members/prof-abraham-nyska>

### **2. Fellow of the International Academy of Toxicologic Pathology (IATP)**

<http://iatpfellow.org/index.php>

- Prof. Abraham Nyska, is a Visiting Full Professor of Pathology, Sackler School of Medicine, Tel Aviv University.

- Prof. Nyska has more than 42 years' experience in evaluation and pre-clinical risk assessment regarding safety-related toxicologic and experimental pathology of chemicals, drugs, medical devices and stem cells.
- He worked for 10 years as a staff scientist and expert in Toxicologic Pathology at the American National Toxicology Program (NTP) of the National Institute of Health (NIH), followed by 8 year as an NTP Consultant.
- Prof. Nyska serves as an Associate Editor of "Toxicologic Pathology". He has strong research-oriented attitude and vast collaboration with top federal research institutes (i.e., NIH, EPA) and academic institutes, with more than **485 publications** in peer-reviewed journals. Prof. Nyska is a consultant in Toxicologic Pathology to pharmaceutical companies, CRO's, and Federal institutes in Israel, Europe, India and the USA.
- His considerable deep knowledge, long-standing expertise, and dedication in the area of Toxicologic Pathology has earned him twice the highly valued NIH Director Award "In recognition of consistent dedication and teamwork, insuring quality evaluation and interpretation of pathology aspects of NTP studies", and "For highly significant scientific and technical contributions to the analysis and reporting of the NTP "dioxin-like chemicals" initiative".

## **VISION STATEMENT**

To provide top global professional service to researchers in the environmental sciences and other disciplines by advancing knowledge to enhance human health

## **PERSONAL INFORMATION**

Birth            Petach Tiqva, Israel, July 26, 1951

Status           Married with three children

### **Address in Israel (Office)**

#### **Abraham Nyska, DVM, Diplomate ECVP, Fellow IATP**

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## **PROFESSIONAL INFORMATION**

Specialization in toxicological pathology, experimental pathology and veterinary diagnostic.

### **Academic studies and degree:**

- 1972 – 1977 – DVM degree, University of Bologna, Italy.

### **Postgraduate training:**

- 1977 – 1978 - Specialization in veterinary pathology, Kimron Veterinary Institute, Department of Pathology, Israel.
- 1978-1980 - Specialization in Toxicologic Pathology, Laboratories of Life Science Research, England.
- 1996 - Diplomate of the European College of Veterinary Pathology (Dipl. ECVP). <http://www.ecvpath.org/>

### **Academic appointment:**

- 1988 – 1996 - Clinical Associate Professor of Veterinary Pathology, Hebrew University of Jerusalem.
- Degree of A+ (equivalent to academic degree of Full Professor) at the National Agriculture Center (Volkani Institute), Ministry of Agriculture
- 2005 - Visiting Full Professor, Sackler School of Medicine, Tel-Aviv University

### **Academic teaching experience:**

- 1988 – 1996 – Courses in Veterinary Pathology. Koret School of Veterinary Medicine, Hebrew University of Jerusalem.
- 2005 - and on - Courses in Toxicologic Pathology. Sackler School of Medicine, Tel-Aviv University

### **Employment:**

- 1977- 1979 – Training in veterinary diagnostic pathology. Pathology department of the “Kimron Veterinary Institute” (under the supervision of Prof. Teodore Nobel.
- 1978-1980 - Toxicologic pathologist, Laboratories of Life Science Research, England.
- 1980-1990 - Established and managed Department of Pathology, Life Science Research Israel (LSRI), Israel Institute for Biological Research (IIBR).
- 1990- 1996 – Expert in veterinary pathology., Pathology department of the “Kimron Veterinary Institute”. Achieving the degree of A+ (equivalent to academic degree of Full Professor) at the National Agriculture Center (Volkani Institute), Ministry of Agriculture.
- 1996 – 1997 - Visiting Scientist, Expert Toxicological Pathologist, National Institute of Environmental Health Sciences (NIEHS) of the National Institutes of Health, National Toxicology Program and Laboratory of Experimental Pathology, Research Triangle Park, NC, USA.
- 1998 - 2005 - Staff Scientist, NIEHS, Research Triangle Park, NC, USA.
- 2005 - on - Consultant in Toxicologic Pathology



## RECENT HONORS AND AWARDS

- \* NIH Director's Award, June, 2000
- \* NIH Employee Staff Recognition Award, August, 2000
- \* NIH Employee Staff Recognition Award, August, 2001
- \* NIH Employee Staff Recognition Award, August, 2002
- \* "Role of oxidative stress in indium phosphide-induced lung carcinogenesis in rats," Barbara C. Gottschling, Robert R Maronpot, James R. Hailey, Shyamal Peddada, Cindy R. Moomaw, James E. Klaunig, and Abraham Nyska was selected as "Toxicological Highlight" in *Toxicological Sciences*: "The article integrates a traditional pathologic study of toxicant-induced pulmonary carcinogenesis with an immunohistologic assessment of oxidative stress, thereby determining a potential mechanism of action of a toxicant, specifically indium phosphide (2001, 64:28-40)."
- \* My research "Inhaled environmental combustion particles cause myocardial injury in the Wistar Kyoto rat," was selected to receive the 2003 Best Paper Award granted by the Board of Publications of the Society of Toxicology of *Toxicological Sciences*.
- \* NIH Employee Staff Recognition Award, April, 2004
- \* NIH Employee Staff Recognition Award, August, 2004
- \* NIEHS Merit Award, December, 2004 (NTP pathologist, carcinogenicity studies of 7 dioxin- like compounds)
- \* The following paper has been selected as winner of the Best Paper On behalf of the Risk Assessment Specialty Section (RASS) of the SOT, Demonstrating the Application of Risk Assessment for 2005.  
Walker, N. J., Crockett, P. W., **Nyska, A.**, Brix, A. E., Jokinen, M. P., Sells, D. M., Hailey, J. R., Easterling, M., Haseman, J. K., Yin, M., Wyde, M. E., Bucher, J. R., and Portier, C. J. (2005). Dose-additive carcinogenicity of a defined mixture of "dioxin-like compounds". *Environ. Health Perspect.* 113(1), 43-48.
- \* The following paper has been selected as winner of the Best Paper on behalf of the Society of Toxicologic Pathology, 2007  
Elmore S, Zheng C, Baum B, Irwin R, **Nyska A**, (2006). The Transduction Of Rat Submandibular Glands By An Adenoviral Vector Carrying The Human Growth Hormone Gene Is Associated with Limited and Reversible Changes at the Injection Site. *Toxicol. Pathol.* 34: 385-392
- \* Work chosen for journal covers, examples are as follows:
  - = **Nyska A**, Murphy E, Foley JF, Collins BJ, Petranka J, Howden R, Hanlon P, Dunnick JK (2005). Acute Hemorrhagic Myocardial Necrosis and Sudden Death of Rats Exposed to a Combination of Ephedrine and Caffeine. *Toxicological Sciences.* 83:388-396.
  - = Kodavanti UP, Moyer C, Ledbetter AD, Schladweiler MC, Costa DL, Hauser R, Christiani DC, **Nyska A** (2003). Inhaled environmental combustion particles cause myocardial injury in the Wistar Kyoto rat. *Toxicol. Sci.* 71: 237-245.

- = **Nyska A**, Moomaw CR, Foley JF, Maronpot RR, Malarkey DE, Cummings CM, Peddada S, Moyer CF, Allen DG, Travlos G, Chan PC (2002). The Hepatic Endothelial Carcinogen Riddelliine Induces Endothelial Apoptosis, Mitosis, S phase, and p53 and Hepatocytic Vascular Endothelial-Growth-Factor Expression After Short-term Exposure. *Toxicol. App. Pharmacol.* 184: 153-164

**2017: USEPA STAA Level 3. For: Evaluating naturally occurring asbestos toxicity to inform risk assessment of contaminated sites.**

" Level III: Level III awards are for those who have accomplished an unusually notable research or technological effort. The awards are for a substantial revision or modification of a scientific/technological principle or procedure, or an important improvement to the value of a device, activity, program, or service to the public. Awarded research relates to a mission or organizational component of the EPA, or significantly affects a relevant area of science/technology "

**The STAA is based on 3 papers published between 2012-2016 as follows, and justifications and other background information in the submission are attached.**

Cyphert, J. M., A. Nyska, R. K. Mahoney, M. C. Schladweiler, U. P. Kodavanti, and **S. H. Gavett**. Sumas Mountain chrysotile induces greater lung fibrosis in Fischer 344 rats than Libby amphibole, El Dorado tremolite, and Ontario ferroactinolite. [Toxicol. Sci. 130:405-415, 2012](#). doi: 10.1093/toxsci/kfs249 Epub 2012 Aug 17.

Kodavanti, U. P., D. Andrews, M. C Schladweiler, **S. H. Gavett**, D. E. Dodd, and J. M. Cyphert. Early and delayed effects of naturally occurring asbestos on serum biomarkers of inflammation and metabolism. [J. Toxicol. Environ. Health A. 77:1024-1039, 2014](#). doi: 10.1080/15287394.

Cyphert, J. M., M. A. McGee, A. Nyska, M. C. Schladweiler, U. P. Kodavanti, and **S. H. Gavett**. Long-term toxicity of naturally occurring asbestos in male Fischer 344 rats. [J. Toxicol. Environ. Health A.79:49-60, 2016](#). doi: 10.1080/15287394.2015.1099123. Epub 2016 Jan 28.

## **RECENT EDITORIAL POSITIONS**

### **2002 – present**

Associate Editor of *Toxicologic Pathology*, the official journal of the American Society of Toxicologic Pathology

### **2005 – present**

Editorial Board, *Toxicological Sciences*, official journal of the American Society of Toxicology.

## **RECENT MEMBERSHIP IN PROFESSIONAL COMMITTEES**

- Member of national and international expert groups dealing with risk evaluation of chemicals, such as the 2-butoxyethanol and riddelline
- Member of expert committee of the Society of Toxicologic Pathology (IN HAND) dealing with the immune system
- Member of expert committee of the Society of Toxicologic Pathology (IN HAND) dealing with the Cardiovascular system
- Member of expert committee of the Society of Toxicologic Pathology (IN HAND) dealing with the Liver
- Member of expert committee of the Society of Toxicologic Pathology dealing with the Liver hypertrophy

## **RECENT CONTINUING EDUCATION COURSES**

- STP Virtual Continuing Education Course: Vaccine Development from the Pathologist Perspective, held on August 28, 2020.

## LIST OF PUBLICATIONS (ARTICLES IN REVIEWED JOURNALS)

- (1) Nobel TA, Klopfer U, Perl S, **Nyska A** (1979). Neoplasms of domestic mammals in Israel (1969-1979). *Refuah Vet.* 36:23-26. (Hebrew and English)
- (2) **Nyska A**, Perl S, Klopfer U, Nobel TA, Kariv N (1979). Two cases of feline spontaneous cerebellar ataxis related to panleucopenia. *Refuah Vet.* 36:47-52. (Hebrew and English)
- (3) **Nyska A**, Perl S, Kaufman I, Perl W, Nobel TA (1979). Ovine cerebrocortical necrosis in an Israeli sheep flock. *Refuah Vet.* 36:135-138. (Hebrew and English)
- (4) Perl S, Klopfer U, **Nyska A**, Bornstein S (1979). A case of female pseudohermaphroditism in a dog. *Refuah Vet.* 36:143-145. (Hebrew and English)
- (5) Perl S, **Nyska A**, Klopfer U, Nobel TA (1979). Laboratory diagnosis of rabies in Israel, 1962-1978. *Refuah Vet.* 36:163-169. (Hebrew and English)
- (6) **Nyska A**, BarGai W, Perl S (1980). Stomach invagination of oesophagus in a dog: A case report. *Refuah Vet.* 36:146-147. (Hebrew and English)
- (7) Kuttin E, Feldman H, Perl S, **Nyska A**, Nobel TA, Trainin R (1980). Canine nocardiosis in Israel. *Refuah Vet.* 37:15-23. (Hebrew and English)
- (8) Nobel TA, Klopfer U, **Nyska A**, Perl S (1981). Feline infectious peritonitis - first case in Israel. *Refuah Vet.* 37:39-41. (Hebrew and English)
- (9) **Nyska A**, Perl S, Klopfer U, Nobel TA, Hilton B (1981). Tumours in the nasal cavity of dogs: A description of five cases. *Refuah Vet.* 37:145-150. (Hebrew and English)
- (10) Perl S, **Nyska A**, Tromp A (1981). Abscess in hypophysis of a cow. *Refuah Vet.* 37:175-176. (Hebrew and English)
- (11) Nobel TA, Klopfer U, Perl S, **Nyska A**, Newmann M (1981). Histopathology of genital besnoitiosis of cows in Israel. *Vet. Parasitol.* 8:271-276.
- (12) Ashkenazy D, Friedman J, Kashman Y, Egyed MN, Shlosberg A, **Nyska A** (1984). Photosensitisation in ducklings, induced by *Pituranthos triradiatus*. *Vet. Hum. Toxicol.* 26:118-120.
- (13) **Nyska A**, Bar Ishak YR, Ashkenazy D, Friedman J, Kashman Y, Lelyveld J (1984). Retinal atrophy in albino rats associated with *Pituranthos triradiatus*-induced photosensitisation. *Vet. Pathol.* 21:551-552.
- (14) Ashkenazy D, Kashman Y, **Nyska A**, Friedman Y (1985). Furocumarins in shoots of *Pituranthos triradiatus* as protectants against grazing of hyrax. *J. Chem. Ecol.* 2:231-239.
- (15) Haan BD, Porat S, **Nyska A**, Titlbaum A, Wexler MA (1986). The effects of cold upon bone growth. *Ann. Plast. Surg.* 16:509-515.
- (16) Nobel TA, **Nyska A**, Pirak M, Meshorer A (1987). Epidermal cysts in the central nervous system of mice. *J. Comp. Pathol.* 97:357-359.
- (17) Nyska M, Porat S, **Nyska A**, Russo M, Shoshan S (1987). Decreased adhesion formation of flexor tendons by topical application of enriched collagen solution - a histological study. *Arch. Orthop. Trauma Surg.* 106:192-194.

- (18) **Nyska A**, Waner T, Pirak M (1987). Thyroideal hypertrophy and hepatic microsomal induction. *Isr. J. Vet. Med.* 43:228-235.
- (19) Porat S, Orth MC, Nyska M, **Nyska A**, Fields S (1987). Assessment of bony bridge by computed tomography. Experimental model in the rabbit and clinical application. *J. Pediatr. Orthop.* 7:155-160.
- (20) Waner T, **Nyska A** (1988). Thyroxine (T4) and triiodothyronine (T3) levels in the Fischer F344 inbred rat. *Lab. Anim.* 22:276-280.
- (21) **Nyska A**, Kuttin ES (1988). Upper respiratory tract infection in mouse and rats. *Mycopathologia* 101:95-98.
- (22) Kuttin ES, **Nyska A** (1988). Cryptococcosis of the nasopharynx in mice and rats. *Mycopathologia* 101:99-104.
- (23) Ben-Dahon J, Gross D, Abu Dabu H, Klein B, Landau EH, **Nyska A**, Krauz MM (1988). The effect of prostaglandin and leukotriene antagonists in acute mesenteric artery occlusion. *Eur. J. Surg. Res.* 20:310-319.
- (24) Pirak M, **Nyska A**, Shahar A, Scolnik M, Waner T (1988). Cytomorphological description of an abdominal extra-adrenal paraganglioma in a Fischer 344 rat. *Lab. Anim. Sci.* 38:736-738.
- (25) Waner T, **Nyska A**, Sela M, Pirak M, Galiano A (1988). Gingival hyperplasia in dogs induced by oxodipine, a calcium channel blocking agent. *Toxicol. Pathol.* 16:327-332.
- (26) **Nyska A**, Waner T, Klein B, Pirak M, Gordon E, Bracha P (1989) The renal carcinogenic effect of Merpafol in the Fischer 344 rat. *Isr. J. Med. Sci.* 25:428-432.
- (27) Zlotogorski A, Nyska M, Sela M, **Nyska A**, Gotsman M (1989) Niphedipine-induced gingival hyperplasia: case reports and literature review. *Isr. J. Med. Sci.* 25:453-455.
- (28) **Nyska A**, Waner T, Scolnik M, Zuckerman A, Pirak M, Gordon EB, Kuehnberg W (1989). Splenic haemosiderosis: A quantitative evaluation of haemosiderin by means of an automatic image analyzer. *Hum. Vet. Toxicol.* 31:218-221.
- (29) Laor O, Waner T, Galiano A, **Nyska A** (1989). Recovery from gingival hyperplasia induced by oxodopine, a calcium channel blocker. *Arch. Toxicol.* 13 (suppl.):433-435.
- (30) **Nyska A**, Waner T, Pirak M, Albeck M, Sredni B (1989). Subacute intraperitoneal toxicity in rats of a new tellurium based immunomodulating drug AS-101. *Arch. Toxicol.* 63:386-393.
- (31) Swissa-Sivan A, Simkin A, Leichter I, **Nyska A**, Nyska M, Statter M, Bivas A, Samueloff S (1989). Effect of swimming on bone growth and development in young rats. *Bone Mineral* 7:91-105.
- (32) Nyska M, Sparler AD, Howard CB, **Nyska A**, Dekel S (1989). Ankle extensor teno-synovitis due to date palm thorn. *Foot Ankle* 10:180-183.
- (33) Waner T, Yuval D, **Nyska A** (1989). Electronic measurement of canine mean platelet volume. *Vet. Clin. Pathol.* 18:84-86.
- (34) Shapira Z, Terkel J, Egozi Y, **Nyska A**, Friedman J (1989). Abortifacient potential for the epigeal parts of *Peganum harmala*. *J. Ethnopharmacol.* 27:319-325.
- (35) Klein B, Klein T, Kunzevski M, **Nyska A**, Luria H, Livni E (1990). The expression of HLA Class I antigen in testicular cancer. *Am. J. Clin. Pathol.* 93:202-207.

- (36) Waner T, **Nyska A**, Bogin E, Levy R, Galiano A (1990). Drug induced decreased aminotransferase activity in the rat as a result of treatment with oxodipine - a new calcium channel blocker. *J. Clin. Chem. Clin. Biochem.* 28:25-30.
- (37) **Nyska A**, Waner T, Pirak M, Galiano A, Zlotogorski A (1990). Gingival hyperplasia in rats induced by oxodipine, a calcium channel blocker. *J. Periodontal Res.* 25:65-68.
- (38) Sperber AD, Nyska M, Howard CB, Dekel S, **Nyska A** (1990). Date palm thorn injury - an animal model. *Isr. J. Med. Sci.* 26:58-60.
- (39) **Nyska A**, Waner T, Zlotogorski A, Nyska M, Pirak M, Scolnik M, Galiano A (1990). Animal model of human disease - Oxodipine induced gingival hyperplasia in Beagle dogs. *Am. J. Pathol.* 137:737-739.
- (40) Wormser U, Ben Zakine S, **Nyska A** (1990) The liver slice system: a simple and reliable acute toxicity test for assessment of hepatotoxins and their antidotes. *Toxicol. In Vitro* 4:449-451.
- (41) Wormser U, Ben-Zakine S, Stivelband E, Eisen O, **Nyska A** (1990). The liver slice system: A rapid *in vitro* acute toxicity test for primary screening of hepatotoxic agents. *Toxicol. In Vitro* 4:783-789.
- (42) Wormser I, Ben-Zakine S, **Nyska A** (1990). Cadmium-induced metallothionein synthesis in the rat liver slice system. *Toxicol. In Vitro* 4:791-794.
- (43) Swissa-Siwan A, Azoury R, Statten M, Leichter I, **Nyska A**, Nyska M, Menczel J, Samueloff S (1990). The effect of swimming on bone modelling and composition in young adult rats. *Calcif. Tissue Int.* 47:173-177.
- (44) Shapira Z, Terkel J, Egozi J, **Nyska A**, Friedman J (1990). Reduction of rodent fertility by plant consumption with particular reference to *Ziziphus spina christi*. *J. Chem. Ecol.* 16:2019-2026.
- (45) **Nyska A**, Waner T, Gordon EB, Bracha P, Klein B (1990). Induction of gastrointestinal tumours in mice fed folpet - possible mechanisms. *Japanese J. Cancer Res.* 81:545-549.
- (46) Shapiro Y, Yadid G, Cotev S, **Nyska A**, Shohami E (1990). Protective effect of MK-801 in experimental brain injury. *J. Neurotrauma* 7:131-139.
- (47) Zlotogorski A, **Nyska A** (1990). Gingival hyperplasia induced by calcium channel blockers (Letter to the Editor). *Int. J. Oral Maxillofac. Surg.* 19:315.
- (48) Klein B, Klein T, **Nyska A**, Shapira J, Figer A, Schwartz A, Rakovsky E, Livni E, Lurie H (1991). The expression of HLA Class I and Class II in gastric carcinoma in relation to pathological stage. *Tumour Biol.* 12:68-74.
- (49) Waner T, **Nyska A** (1991). Review: The toxicological significance of declines in the activities of blood alanine and aspartate aminotransferase. *Vet. Res. Commun.* 15:73-78.
- (50) Pirak M, Waner T, Abramovici A, Scolnik M, **Nyska A** (1991). Spontaneous choriocarcinoma in a male Sprague-Dawley rat: A histological and immunohistochemical study. *Vet. Pathol.* 8:93-95.
- (51) Waner T, **Nyska A**, Chen R (1991). Distribution profile of the activities of blood alanine and aspartate aminotransferases in the normal Fischer 344 inbred rat throughout its life-span as a function of age and sex. *Lab. Anim.* 25:280-289.
- (52) **Nyska A**, Pirak M, Shahar A, Scolnik M, Waner T (1991). Spontaneous uterine granular cell tumour in the Fischer 344 rat. *Lab. Anim.* 25:299-302.

- (53) **Nyska A**, Waner T, Tal N, Dayan D (1991). Spontaneous ameloblastic-fibro-odontoma in a female CD-1 mouse. *Oral Pathol. Med.* 20:250-252.
- (54) **Nyska A**, Waner T, Goldstein J, Bar Joseph A, Pirak M (1991). Spontaneous rete testes adenocarcinoma in a Fischer 344 rat. A cytomorphological and ultrastructural study. *J. Comp. Pathol.* 104:449-459.
- (55) Klein B, Klein T, Figer A, Bleiberg M, Shapira J, Lurie H, **Nyska A** (1991). Soluble HLA Class I in breast cancer patients in relation to tumour burden. *Cancer* 67:2295-2299.
- (56) Wormser U, Ben Zakine S, **Nyska A** (1991). Hepatic and renal metallothioneine induction in the rat and mouse after treatment with furosemide. *Biochem. Int.* 23:419-428.
- (57) Waner T, Pirak M, **Nyska A** (1991). Lungworm in colony of Beagle dogs: a case report and literature review. *Isr. J. Vet. Sci.* 46:106-109. (Hebrew and English)
- (58) Kuttin ES, Waner T, **Nyska A** (1991). Viral haemorrhagic disease in rabbits in Israel. *Isr. J. Vet. Sci.* 46:119-124. (Hebrew and English)
- (59) Waner T, **Nyska A** (1991). Gingival hyperplasia in dogs. *Compendium Vet. Med.* 13:1207-1213.
- (60) Wormser U, **Nyska A** (1991). Protective effect of o-phnanthroline against mechorethamine toxicity in the rat liver slice system and the guinea pig skin. *Arch. Toxicol.* 65:666-670.
- (61) Harmelin A, Shapira M, Ben-Ziony Y, Yakobson B, Perl S, **Nyska A**, Orgad U (1991). Prosteal osteosarcoma in a dog. *Isr. J. Vet. Sci.* 46:145-147.
- (62) Zusman I, Zimber A, **Nyska A** (1991). Role of morphological methods in the analysis of chemically induced colon cancer in rats. *Acta Anat.* 142:351-356.
- (63) Yussim A, Sosna Y, Shapira Z, **Nyska A**, Prass M (1991). Azathioprine enhances experimental amyloidosis and attenuates colchicine protection against organ deposition of amyloid. *Transplant. Proc.* 23:2192-2193.
- (64) Zusman I, Zimber A, Madar Z, **Nyska A** (1992). Morphological, histochemical, and immunohistochemical differences between tumorous and adjacent tissues in chemically induced colon cancer in rats. *Acta Anat.* 145:29-34.
- (65) **Nyska A**, Galiano A, Klein B, Waner T (1992). The fate of altered hepatocytic foci (AHF) as a result of treatment with oxodipine, a calcium channel blocker. *Pharmacol. Toxicol.* 70:439-442.
- (66) **Nyska A**, Waner T, Wormser U, Gur E, Kuttin ES, Dayan D (1992) Possible pitfalls in the rat dermal toxicity test. *Arch. Toxicol.* 66:339-346.
- (67) Harmelin A, Dubey JP, Yakobson B, **Nyska A**, Orgad U (1992). Concurrent Hepatozoon canis and Toxoplasma gondii infection in a dog. *Vet. Parasitol.* 43:131-136.
- (68) **Nyska A**, Waner T, Dayan D, Skutelski E, Shapira S, Galiano A (1992). Oxodipine, a calcium channel blocker, induced thickening of the zona glomerulosa in dogs. *Toxicol. Pathol.* 20:549-555.
- (69) Markovitz A, Harmelin A, Orgad U, Yakobson B, **Nyska A** (1992). A case of natural Hydatidosis in a baboon. *J. Comp. Pathol.* 106:435-438.

- (70) Nyska M, **Nyska A**, Wolter K (1992). The effect of thionaphthene-2-carboxylic acid (TNCA) on bone structure in the rat: a histomorphometric study. *Int. J. Exp. Patholol.* 73:733-740.
- (71) Zusman I, Madar Z, **Nyska A** (1992). Individual variability of pathological parameters in chemically induced rat colon cancer. *Acta Anat.* 145:106-111.
- (72) **Nyska A**, Harmelin A, Waner T, Klein B, Bar-Ishak R (1992). Intraocular vascular embolization of a malignant canine pheochromocytoma. *Prog. Vet. Comp. Ophthalmol.* 2:129-132.
- (73) Mosheiff R, Klein BY, Leichter I, Chaimsky G, **Nyska A**, Peyser A, Segal D (1992). Use of dual-energy X-ray absorptiometry (DEXA) to follow mineral content changes in small ceramic implants in rats. *Biomaterials* 13:462-466.
- (74) Dayan D, Waner T, Tal H, **Nyska A** (1993). Polarization microscopy of Picrosirius red-stained collagen from oxodipine-induced hyperplastic gingiva of Beagle dogs. *Int. J. Exp. Pathol.* 74:225-228.
- (75) **Nyska A**, Harmelin A, Baneth G, Yakobson B, Perl S, Orgad U (1993). Supracellar differentiated germ cell tumor in a male dog. *J. Vet. Diagn. Invest.* 5:462-467.
- (76) Madar Z, Timar B, **Nyska A**, Zusman I (1993). Effects of high-fiber diets on pathological changes in DMH-induced rat colon cancer. *Nutr. Cancer* 20:87-96.
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- (192) Elmore S, **Nyska A**, Zheng C, Baum B, Irwin R (2005). The Transduction Of Rat Submandibular Glands By An Adenoviral Vector Carrying The Human Growth Hormone Gene Is Associated with Limited and Reversible Changes at the Injection Site. *24<sup>th</sup> Annual Symposium of the Society of Toxicologic Pathology*, Washington, DC.
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- (198) Ramot Y, Lewis DA, ; Ortel TL, Streicker M, Glenda M; Elmore S, ; Ward S, Peddada S, **Nyska A** (2006). Age and dose-related sensitivity in 2-butoxyethanol F344 rat model of hemolytic anemia and disseminated thrombosis. *45<sup>th</sup> Annual Meeting of the Society of Toxicology*, Dan Diego, CA
- (199) Wallenborn JC, Schladweiler M, Ledbetter AD, **Nyska A**, Johnson JA, Thomas R, Jaskot R, Richards JH, Kodavanti UP (2006). Comparison of cardiopulmonary responses of Wistar Kyoto (WKY) and stroke prone spontaneously hypertensive rats (SHRSP) to particulate matter (PM) exposure. *45<sup>th</sup> Annual Meeting of the Society of Toxicology*, Dan Diego, CA
- (200) Wyde M, Hejtmancik M, Johnson J, **Nyska A**, Vallant M, Easterling M, Bucher J, Walker N (2006). Relative carcinogenic potency of PCB 126 and PeCDF in dermally exposed female Tg.AC mice. *45<sup>th</sup> Annual Meeting of the Society of Toxicology*, Dan Diego, CA
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- (202) Golomb E, Schneider, Houminer, Dunnick J, Kissling G, Borman, **Nyska A**, Schwalb H (2006). Bis(2-chloroethoxy)Methane Impairs Cardiac Mitochondrial Response to Ischemic Injury; Ex Vivo Assessment of the Functional Mitochondrial Effect of a Cardiotoxic Agent. *25<sup>th</sup> Annual Meeting of the Society of Toxicologic Pathology*, Vancouver, Canada.
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- (204) Kodavanti U, **Nyska A**, Ledbetter A, Schladweiler M, Gottipolu R, Wallenborn G, Thomas R, Jaskot R, Richards R, Crissman K, Hatch G, Kissling G<sup>2</sup>, Maronpot R (2006). Cardiovascular diseases, susceptibility to oxidative injury and compensatory mechanisms: Insights from rodent models. *25<sup>th</sup> Annual Meeting of the Society of Toxicologic Pathology*, Vancouver, Canada.
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- (207) Sells DM, Brix AE, **Nyska A**, MP Jokinen MP, Orzech DP, Walker NJ (1006). Respiratory tract lesions in non-inhalation studies. *Annual Meeting of the Society of Toxicologic Pathology*, Vancouver, Canada.
- (208) Yoshizawa K, Walker NJ, Jokinen MP, Brix AE, Sells DM, **Nyska A**, Wyde ME (2006). Thyroid Follicular Lesions Induced by Oral Treatment for Two Years with 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-like Compounds in Female Harlan Sprague-Dawley Rats.. *Annual Meeting of the Society of Toxicologic Pathology*, Vancouver, Canada.
- (209) Gottipolu R, , Schladweiler MC, **Nyska A**, Malarkey D, Wallenborn JG, Ledbetter AD, Winsett D, Richards JH, Krantz T, Gilmour MI, Thomas R, Jaskot RH, Kodavanti UP. (2007). Pulmonary and systemic effects of four week diesel inhalation in healthy and hypertensive rats. *46<sup>th</sup> Annual Meeting of the Society of Toxicology*, Charlotte, North Carolina.
- (210) Schladweiler MC, **Nyska A**, Malarkey D, Ledbetter AD, Wallenborn JG, Gottipolu RR, Richards JH, Thomas R, Jaskot RH, Shannahan J, Crissman K, Hatch GE, Kodavanti UP. (2007). Comparative evaluation of risk factors for cardiovascular disease (CVD) in genetically predisposed rats. *46<sup>th</sup> Annual Meeting of the Society of Toxicology*, Charlotte, North Carolina.
- (211) Wallenborn JG, Schladweiler MC, Ledbetter AD, Krantz T, **Nyska A**, Johnson J, Linak WP, Gottipolu R, Richards JH, Kodavanti UP. (2007). Differential cardiac susceptibility of Wistar Kyoto (WKY) and spontaneously hypertensive rats (SHR) to diesel exhaust particles (DEP) exposure. American Thoracic Society Meeting, San Francisco.
- (212) Wyde ME, Bordelon NR, **Nyska A**, Mann J, Hebert CD, Bucher JR (2007). Thirteen week toxicity study of indole-3-carbinol in B6C3F1 mice and Fischer 344 rats. *46<sup>th</sup> Annual Meeting of the Society of Toxicology*, Charlotte, North Carolina.

- (213) Yoshizawa K, Brix AE, Sells DM, Jokinen MP, Wyde M, Walker NJ, **Nyska A** (2007). Reproductive Lesions in Female Harlan Sprague-Dawley Rats Following Two-year Oral Treatment with Dioxin and Dioxin-like Compounds. Society of Toxicologic Pathologist Meeting, San Juan, USA.
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- (215) Wyde ME, Bordelon NR, Mann J, Hill G, Painter JT, Yoshizawa K, Hebert CD, Bucher JD, **Nyska A** (2007). Subchronic administration of indole-3-carbinol in B6C3F1 mice and Fischer 344 rats is associated with increased hepatic CYP 1A1 and 1A2 activities, but without liver toxicity. Society of Toxicologic Pathologist Meeting, San Juan, USA.
- (216) Heatherly A, Yoshizawa K, Malarkey DE, Walker NJ, **Nyska A** (2007). A Critical Comparison of Murine Pathology and Epidemiological Data of Dioxins and PCBs (candidate for student travel award). Society of Toxicologic Pathologist Meeting, San Juan, USA.
- (217) Wallenborn, J. G., Evansky, P., Shannahan, J. H., Schladweiler, M. C., Vallanat, B., Gottipolu, R., Ledbetter, A. D., Richards, J. H., **Nyska, A.**, Kodavanti, U. P. (2008). SUBCHRONIC INHALATION OF ZINC SULFATE CAUSES CARDIAC CHANGES IN HEALTHY RATS. *47<sup>th</sup> Annual Meeting of the Society of Toxicology*,
- (218) M.C. Schladweiler, A.D. Ledbetter, J. Shannahan, J.G. Wallenborn, **A. Nyska**, D. Malarkey, J. Richards, H. Tong, R.B. Devlin and U.P. Kodavanti (2008). SUBCHRONIC EPISODIC EXPOSURE OF RATS TO DIESEL PLUS OZONE INDUCES MINIMAL CARDIOPULMONARY EFFECTS. *47<sup>th</sup> Annual Meeting of the Society of Toxicology*,
- (219) Matthew D. Stout; Bradley J. Collins; Ronald A. Herbert; **Abraham Nyska**; Grace E. Kissling; Keith Levine; Glenn T. Ross; Charles D. Hébert; Gregory S. Travlos; John R. Bucher; and Michelle J. Hooth (2008). Toxicity and carcinogenicity of chromium following chronic oral exposure: dependence on valence state and tissue uptake. *47<sup>th</sup> Annual Meeting of the Society of Toxicology*,
- (220) Singh BP, **Nyska A**, Malarkey D, Dunnick J, (2008). Investigations of effects of Milk thistle in two-years feeding study using F344/N rats and B6C3F1 mice. *47<sup>th</sup> Annual Meeting of the Society of Toxicology*,
- (221) U.P. Kodavanti, R.F. Thomas, M.C. Schladweiler, A.D. Ledbetter, J. Shannahan, J.G. Wallenborn, **A. Nyska**, J. Richards, R. Jaskot (2008). NOVEL INSIGHTS INTO THE MECHANISM OF SUBCHRONIC AIR POLLUTANT-INDUCED CARDIOVASCULAR IMPAIRMENT. *American Toracic Society meeting, Toronto, Ontario, Canada*.
- (222) Ramot, Y., **Nyska, A.**, Lieuallen, W., Maly, A., Zlotogorski, A., Flake, G., Kissling G. E., Brix, A., Malarkey, D. E. and Hooth, M. (2008) Inflammatory and chloracne-like skin lesions in B6C3F1 mice exposed to tetrachloroazobenzene (TCAB) for 2 years. Society of Toxicologic Pathologist Meeting, San Francisco, USA
- (223) Singh, B. P., **Nyska, A.**, Johansson, S., Malarkey, D. E., and Hooth, M. J. (2008) Urethral transitional cell carcinoma and hyperplasia in B6C3F1 mice treated with tetrachloroazobenzene (TCAB). Society of Toxicologic Pathologist Meeting, San Francisco, USA.
- (224) Manno R., Ramot Y., Yoshimasa O, Krakovsky M, Lamensdorf I., Meiron M, Toren A., **Nyska A**. (2009). Spontaneous Aortitis in the Balb/c Mouse. Society of Toxicologic Pathologist Meeting, Washington, DC. USA.

(225) Boudonck KJ, Mitchell MW, Shinar D, **Nyska A**, Moti Rosenstock (2009). Discovery of Metabolomics Biomarkers for Early Detection of Nephrotoxicity. Society of Toxicologic Pathologist Meeting, Washington, DC. USA.

(226) Walker NJ, Easterling M, **Nyska A**, Kissling GE, Smith CS, Malarkey D, Hooth MJ (2010). Carcinogenic potency of 2,3',4,4',5-pentachlorobiphenyl (PCB118) in female Harlan Sprague-Dawley rats. *48<sup>th</sup> Annual Meeting of the Society of Toxicology*,

(227) Padilla-Carlin DJ, Schladweiler MCJ, Kodavanti UP, Shannahan JH, Richards JH, **Nyska A**, Bern A, Lowers H, Meeker G, Gavett SH (2010). Cellular and inflammatory responses in bronchoalveolar lavage and lungs in rats after intratracheal instillation of Libby amphibole or amosite asbestos. *48<sup>th</sup> Annual Meeting of the Society of Toxicology*.

(228) Kodavanti, UP, Thomas R, Lund A, Schladweiler, MC, Campen MJ, Shannahan JH, Ledbetter AD, Richards JE, **Nyska A**, Jaskot RH, Butler EO, Parinandi NJ, (2010). Oxidized lipids and lipid mediators are involved in the cardiovascular injury induced by diesel exhaust particles (DEP) and oxone. *48<sup>th</sup> Annual Meeting of the Society of Toxicology*.

(229) Cyphert JM, Padilla-Carlin DJ, Schladweiler MC, **Nyska A**, Shannahan JH, Kodavanti UP, and Gavett SH. (2011). Long term response of rats to single intratracheal exposure of Libby Amphibole (LA) or Amosite. *49<sup>th</sup> Annual Meeting of the Society of Toxicology*.

(230) Behl M, **Nyska A**, Hejtmancik M and Chan PC (2011). Liver toxicity following Kava Kava administration in F344 Rats and B6C3F1 Mice. *49<sup>th</sup> Annual Meeting of the Society of Toxicology*.

(231) Shannahan JH, **Nyska A**, Cesta MF, Vallant BD, Schladweiler MCJ, Gavett SH<sup>5</sup> Kodavanti UP (2011) Early onset of unique proliferative lesions in the lungs of a Libby Amphibole exposed rat model of cardiovascular disease-associated iron overload. American Thoracic Society Meeting,

(232) Cyphert JM, Padilla-Carlin DJ, **Nyska A**, Shannahan JH, Schladweiler MC, Kodavanti UP, and Gavett SH. (2012). Acute Toxicological Responses of Fischer Rats to Naturally Occurring Asbestos from the United States and Canada *51<sup>th</sup> Annual Meeting of the Society of Toxicology*.

(233) Poster: Detecting and quantifying liver pathologies using compact, high-resolution 3D MRI-based Histology. Yael S Schiffenbauer, Catherine Tempel-Brami, Rinat Abramovitch, Tali Lanton, Jonathan H. Axelrod, Eithan Galun, **Abraham Nyska** and Robert Maronpot. EUROPEAN SOCIETY OF TOXICOLOGIC PATHOLOGY SYMPOSIUM, GHENT, BELGIUM

(234) POSTER: Significant lessening of local reactions following continuous subcutaneous administration of ND0701, a new apomorphine formulation for Parkinson's Disease – MRI and histopathology studies. Ronit Shaltiel-Karyo, Hanita Ovadia, Yonit Tzarfati, Oron Yacoby-Zeevi, Yael Schiffenbauer and **Abraham Nyska**. EUROPEAN SOCIETY OF TOXICOLOGIC PATHOLOGY SYMPOSIUM, 2014, BERLIN, GERMANY

(234) LECTURE: The Utility of Compact MRI for Assessment of Phenotypes and Therapeutic Efficacy, Yael Schiffenbauer, **Abraham Nyska**, EUROPEAN SOCIETY OF TOXICOLOGIC PATHOLOGY SYMPOSIUM, 2015, Surrey, UK

(235) POSTER: Ex-vivo Compact Magnetic Resonance Imaging (MRI) of the Brain with Histopathology Validation in a Rat Model of Huntington Disease. Yael Schiffenbauer, Enrico Vezzali, Edgar Weber, Rebekka Pietrek, Michel Steiner, **Abraham Nyska**. EUROPEAN SOCIETY OF TOXICOLOGIC PATHOLOGY SYMPOSIUM, 2015, Surrey, UK

(236) POSTER: The use of in vivo and ex vivo compact magnetic resonance imaging (MRI) for the assessment of tumorigenicity following intrathecal transplantation of human embryonic stem cells

(hESC) in NOD-SCID mice. Schiffenbauer Yael, Amouyal Netanel, Ezov Nati, Steiner Michal, Izrael Michal, Lavon Neta, Hasson Arik, Revel Michel and **Nyska Abraham**. EUROPEAN SOCIETY OF TOXICOLOGIC PATHOLOGY SYMPOSIUM, 2016, Barcelona, Spain

(237) POSTER: Trauma as a cause for hepatopathy in newborn Göttingen minipigs: a procedure-related finding complicating interpretation of toxicity studies. Ramot Yuval, Weber Klaus, Moreno Lobato Beatriz, Sánchez Margallo Francisco Miguel, Guillén Caro José Francisco, Dávila Gómez Luis, Shabat Roni and **Nyska Abraham**. EUROPEAN SOCIETY OF TOXICOLOGIC PATHOLOGY SYMPOSIUM, 2016, Barcelona, Spain

(238) POSTER: 3D MRI-Based Histology Using Compact, High-Resolution MRI. Yael S. Schiffenbauer, Catherine Tempel-Brami, Rinat Abramovitch, **Abraham Nyska**, Robert Maronpot, SOCIETY OF TOXICOLOGIC PATHOLOGY SYMPOSIUM, Portland, Oregon, USA, 2013

(239) POSTER: Quantitative Evaluation of Drug-Induced Microvascular Constriction in Mice Kidney Using a Novel Tool for 3D Geometrical Analysis of Ex Vivo Organ Vasculature. Raul Brauner, Yuval Ramot, Kongbin Kang,, John V. Heymach, Stacia Furtado,, **Abraham Nyska**. SOCIETY OF TOXICOLOGIC PATHOLOGY SYMPOSIUM, Washington DC, 2014

(240) POSTER: Significant Lessening of Local Reactions Following Continuous SC Administration of ND0701, a New Apomorphine Formulation for Parkinson's Disease—MRI and Histopathology Studies. Ronit Shaltiel-Karyo, Hanita Ovadia, Yonit Tzarfati, Yael Schiffenbauer, **Abraham Nyska**, Oron Yacoby-Zeevi, SOCIETY OF TOXICOLOGIC PATHOLOGY SYMPOSIUM, Washington DC, 2014

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