



PASPCR

Newsletter

Volume 8 Number 3

September, 2000

Introduction . . .

The **PASPCR Newsletter** is published quarterly and is intended to serve as a means of communication for the members of our Society. As such, we invite our membership to actively contribute to it. If you attend a scientific meeting and heard results which you think will be of interest to the membership of the **PASPCR**, please write a few paragraphs summarizing what was presented and share it with us. Any information on up-coming meetings of interest will also be included. We also want to note any change of affiliation or address that you may have had to help us keep our membership list up-to-date. This is **your Newsletter**, and we depend upon you to help us make sure it best serves the Society's needs. Contributions and comments can be sent to Bill Oetting, preferably by Email, to bill@lenti.med.umn.edu.

The **PASPCR Web** page is the major, up-to-date source of current information for the PASPCR membership. The URL address to our home page is <http://www.cbc.umn.edu/paspcr>. The PASPCR Web page contains information about the PASPCR including the goals, ByLaws and Rules of the Society, future meetings, past issues of the **PASPCR Newsletter** as well as links to other related sites including the InterPig DataBase, the International Federation of Pigment Cell Societies (IFPCS) and the regional Pigment Cell Societies from Europe and Japan. In addition, an updated PASPCR membership directory is available on the PASPCR Web page; please notify us if you wish any or all of your information to be modified or deleted on that site. The PASPCR home page also includes positions available and positions wanted. Postings for **Positions Available** are open to all individuals so long as the position is related to pigment cell research. Postings for **Positions Wanted** will be open only to members of the PASPCR or its sister societies (JSPCR and ESPCR). Please provide an expiration data for any submitted postings. If there is additional information that you wish to have added to this web page, please let us know. Send any comments and/or suggestions to the PASPCR WebMaster, Bill Oetting at bill@lenti.med.umn.edu.

Note: The IFPCS webpage has a new URL address at <http://www.cbc.umn.edu/ifpcs>.

IN THIS ISSUE

Introduction	p 1
PASPCR Contact Information	p 2
Calendar of Events.....	p 2
Welcome New Members	p 3
Corporate Sponsors.....	p 3
From the Editor - Pigment Cell Research	p 3
And Now, for the Rest of the Story.....	p.4
Robert Smyth and the Smyth Chicken	
Report from the IX Annual PASPCR Meeting .	p.6
Positions Wanted / Available	p 14
Bibliography	p 15

**PanAmerican Society for
Pigment Cell Research**

c/o **Dr. James J. Nordlund**
Department of Dermatology
University of Cincinnati
231 Bethesda Avenue
Cincinnati, OH 45267-0592
FAX: (513) 558-0198

Officers

Richard A. King
President
Zalfa Abdel-Malek
President-Elect
James J. Nordlund
Secretary/Treasurer

Council Members

Jean L. Bologna
Mary K. Cullen
Meenhard Herlyn
Helene Z. Hill
Estela E. Medrano
Randy Morrison
William J. Pavan
Vijay Setaluri
Giselle Thibaudeau

IFPCS Representative

Sally Frost-Mason
past-President PASPCR

The **PASPCR Newsletter** is published quarterly; for further information or to submit articles, contact:

Publications Committee:

William S. Oetting, PhD

University of Minnesota
Department of Medicine - Genetics
MMC 485
420 Delaware St. S.E.
Minneapolis, MN 55455
Phone: (612) 624-1139
Email: bill@lenti.med.umn.edu

Vijayasradhi Setaluri, PhD

Wake Forest University School of Medicine
Department of Medicine
Winston-Salem, NC 27157
Phone: (336) 716-3273
Email: setaluri@bgsu.edu

Giselle Thibaudeau, PhD

Mississippi State University
Department of Biological Sciences
Harned Hall
Mississippi State, MS 39762
Phone: (662) 325-7572
Email: Giselle@ra.msstate.edu

Calendar of Events :

Sept 28 - Oct 1, 2000 9th Annual Meeting of the European Society for Pigment Cell Research, to be held in Ulm, Germany
Contact: Prof. R.U. Peter, University of Ulm (BWK) Dept of Dermatology Oberer Eselsberg 40 D - 89081 ULM
Tel: 49-731 502-3770
Fax: 49-731 502-3772
E-mail: ralf.peter@medizin.uni-ulm.de

Dec 5-6, 2000 13th Meeting of the Japanese Society for Pigment Cell Research, to be held in Sapporo, Japan,
Contact: K Jimbow

Feb 28, March 3, 2001 5th World Conference on Melanoma : Venice, Italy, February 28 - March 3
Contact: Dr Mario Santinami Secretary General 5th World Conference on Melanoma Casa di Cura S. Pio X Via F. Nava 31 I - 20159 Milano
Phone/Fax: 39-02-69516449
E-Mail : info@melanoma2001.org

Jun 25 - 28, 2001 Xth Annual Meeting of the PanAmerican Society for Pigment Cell Research, to be held in Minneapolis, MN
Contact: Dr. Richard A. King, Department of Medicine, Box 485 Mayo, 420 Delaware St. S.E., Minneapolis, MN 55455;
Phone: (612) 624-0144
Fax: (612) 624-6645
Email: king@mail.ahc.umn.edu.

2002 The XVIIIth International Pigment Cell Conference, to be held in The Hague, Holland.
Contact: Dr. Stan Pavel, President ESPCR, University Hospital Leiden, Dept of Dermatology, PO Box 9600, NL - 2300 RC LEIDEN
Phone: 31-(71) 526 1952
Fax: 31-(71) 524 8106;
E-mail: SPavel@algemeen.azl.nl

Sept 3-7, 2003 XIth Annual Meeting of the PanAmerican Society for Pigment Cell Research, to be held in Wood's Hole, MA.

Welcome to New Members

by James J Nordlund

We welcome the following new member to the PASPCR . . .

Lidia Kos, Ph.D. of the Florida International University

James A. Lister, Ph.D. of the University of Washington

If anyone is interested in joining our Society or wishes to sponsor a member, application forms can be obtained from Dr. James J. Nordlund at the PASPCR Secretary/Treasurer's office.

Corporate Sponsors

by James J Nordlund

The PASPCR would like to acknowledge and thank our Corporate Sponsors; the list below reflects contributions over the past 2 years. Financial gifts from these sponsors have allowed our Society to increase benefits to the membership far out of proportion to the actual dues collected from members. Monies contributed by these sponsors have been used over the years to support various PASPCR functions including our Young Investigator Award program, meeting travel stipends, annual meeting expenses and this Newsletter.

GOLD Corporate Patrons

Procter and Gamble Co

Shiseido Co, Ltd

SILVER Corporate Patrons

Avon Products, Inc

Galderma Laboratories, Inc

Stiefel Laboratories

Combe, Inc.

From the Editor - *Pigment Cell Research*

Vince Hearing, Editor

Announcement - Award for Publication Excellence - 2000

At its recent business lunch held during the PASPCR Meeting in College Station, the Editorial Board of *Pigment Cell Research* established an annual award for The Most Outstanding Contribution published in *Pigment Cell Research* each year. The top paper published this year 2000 (Volume 13) will be determined and awarded following distribution of the last issue this year. All Original Research Articles will be considered for the Award, which will be decided by the Editorial Board. The winner will be announced early in 2001 and will receive a year's free subscription to the journal as well as an Award of Achievement. The winner will also be featured in a brief article in the journal next Spring that will present a summary of the victorious study and the reasons behind its selection as the best in Volume 13. This Outstanding Contribution Award is dedicated in this Inaugural year to the memory of Profs. Yoshiaki Hori and Bengt Larsson, two ardent supporters of *Pigment Cell Research* over the years. Good Luck to all authors.

And now for the rest of the story.

I have always been interested in how a particular line of research began. Was it well planned out, did it come to the investigator in a dream, or was it just serendipity? In this section of the PASPCR Newsletter I plan to publish stories on the background of discoveries in pigment research. In this issue, Dr. Robert (Bob) Smyth talks about the origin of the Smyth chicken. I hope that you will enjoy these stories. If you wish to know how a particular line of investigation got started, please email me at bill@lenti.med.umn.edu, and I will try to get **the rest of the story**.

Origin and Development of the Smyth Chicken Line: A Model for Autoimmune Vitiligo

by Professor Emeritus J. Robert Smyth
University of Massachusetts
Amherst, MA 01003

It was a grey day in November, 1971, hardly one that held promise of any excitement since the chore that day was to make up reproduction matings for the next generation of some of my purelines. No segregating progeny groups were expected here. Simply select healthy birds of desired phenotype for the matings. A white hen in an otherwise pen of brown colored chickens (Massachusetts Brown line) raised little interest as farm workers frequently throw pen escapees into the most convenient nearby enclosure. The wing band number of the odd white hen, however, indicated that she was supposed to be a Brown line bird. Furthermore, the records showed that her down color at hatching had been a typical brown stripe. All of a sudden, she became an object of extreme interest as she had lost her feather melanins during the three feather changes prior to the attainment of her adult plumage at 20-22 weeks of age.

To determine whether the altered expression of feather melanin had a genetic basis, matings were made between the amelanotic female and normal Brown line males. Since the original white female came from a non-pedigreed multiple male mating, she was artificially inseminated with pooled semen from 5 randomly selected males. At hatching, all 45 progeny had brown striped down typical of the Brown Line. One of these, a male, developed white plumage by sexual maturity. Unlike his mother who was blind at sexual maturity, he remained fully sighted throughout his life. We had now established that the vitiligo-like pigment defect was heritable. Subsequent matings between the vitiliginous mother and son and between them and normally pigmented Brown line birds indicated that the abnormality was not inherited in a simple Mendelian fashion. This was further substantiated by outcrosses to 3 unrelated lines for genetic study and to provide a few outcross amelanotics to broaden the genetic base of a new vitiligo line. The absence of vitiligo among F₂ progeny and the low incidence among the backcross offspring suggested multiple interacting genes present in the vitiliginous Brown line birds.

The base population that was used to develop the new vitiligo line (Smyth line) originated from generation 3, intra-Brown line vitiliginous birds plus a few backcross progeny from the F₁ outcross birds x Brown Line amelanotics. In the following generation the brown plumage pattern was refixed in the new line. The only marker gene still segregating in the Smyth lines is a sex-linked gene (\underline{id}^+) that allows dermal eumelanin to be deposited in

the scaly shanks and a few other connective tissues of the bird. Although it is not possible to ascertain precisely the genetic contribution of the 3 original outcrosses, there is little evidence that it was but little. Selection for posthatch feather amelanosis was continued thereafter. The incidences of vitiligo and blindness were 59.8% and 25.6% respectively in the G₄ generation and 85.6% and 39.6% respectively in the G₅ generation. The incidences changed but little after that even though only vitiliginous birds were used for line reproduction.

During the early years of the development of the Smyth line, a considerable body of knowledge on the basis for the pigment defect was accumulated. Its many similarities to human vitiligo were observed including a higher than expected incidence of Hashimoto's thyroiditis, an alopecia-areata like feathering defect, retinal pigment changes, remelanization, etc. Earliest co-workers included Dr. Kay Fite, an ocular biologist here at UMass, and Dr. Ray Boissy, who studied the Smyth line vitiligo for both his M.S. and Ph.D. theses. They were soon followed by Dr. Susan Lamont, a postdoc in my laboratory who took the leadership in our studies of the role of the immune response in our mutant pigment defect. These were followed by other graduate students and postdocs, but the above played the major role in our key early studies.

One of the factors we found to play a role in the expression of the vitiligo was the MHC (major histocompatibility complex). It is now known that the MHC and other histocompatibility genes typically play a role in the expression of autoimmune defects. With the aid of Dr. Elwood Briles and his wife at Northern Illinois University we established that the Smyth line and its Brown parent line were polymorphic for 3 different MHC haplotypes (designated B101, B102 and B103). The haplotypes were further found to be associated with different levels of expression of the pigment defect. For example, the B101 haplotype had the earliest onset of vitiligo, the most complete pigment loss and a high incidence of blindness. The B102 and B103 haplotypes had a later onset of pigment loss and a low incidence of blindness. Because of the random occurrence of these 3 haplotypes in both the Smyth line and its Brown line control, it was decided to establish sublines that would each be homozygous for one of the MHC haplotypes. Both MHC-matched vitiliginous and parental Brown line controls were established. These were designated as SL101, SL102 and SL103 (Smyth lines) and their respective parental controls, BL101, BL102 and BL103. Not unexpectedly, the SL sublines showed similar relationships to the expression of the vitiligo first seen in the segregating MHC haplotypes of the original Smyth line population. The total incidence of vitiligo rarely differs, however, among the 3 SL sublines.

More recent studies have concentrated on the following areas:

- (1) Autoantibodies (Drs. Lisa Austin and Ray Boissy, University of Cincinnati)
- (2) Role of T-cell subsets in various tissues in SL vitiligo (Dr. Gisela Erf, University of Arkansas)
- (3) Roles of exogenous and endogenous viruses in the expression of SL vitiligo (Drs. Sreekumar, Lakshmanan, UMass and G. Erf, University of Arkansas)
- (4) Molecular genetics and characterization of the SL (Ponce de Leon, Sreekumar and Lakshmanan, UMass)

At present, there are no more SL birds at UMass. SL101 and 102 sublines and their controls are with Dr. Gisela Erf at the University of Arkansas (Telephone: 515/575-8664) and SL101 and SL103 are with Dr. F. Abel Ponce de Leon at the University of Minnesota (Telephone: 612/624-1205).

The most complete and detailed review of the Smyth line through 1989 appeared in *Critical Reviews in Poultry Biology*, 2: 1-19, 1989. I will be happy to provide reprints for interested people (J. R. Smyth, Ph.D., 307A Stockbridge Hall, University of Massachusetts, Amherst, MA 01003-7250).

Report on the IX Annual Meeting of the PanAmerican Society for Pigment Cell Research

Below are reports on various sessions of the PASPCR IX Annual Meeting. I would like to thank those individuals who wrote the excellent reviews on the sessions that they attended for this newsletter. I am sure that you will agree that the meeting in Texas hosted by Lynn Lamoreux and Estela Medrano was an excellent meeting filled with science covering a broad range of topics in the pigment field.

Symposium on Signal Transduction, UV Radiation, and Pigmentation

Report by Zalfa Abdel-Malek

Hee-Young Park was the invited speaker at this symposium. She discussed recent results from her laboratory demonstrating the expression of RACK (Receptor for Activated Kinase) on melanosomes, and providing further evidence for the role of PKC β in regulating pigmentation. She concluded that stimulation of cAMP formation leads to PKC β activation, which in turn phosphorylates tyrosinase and increases its activity.

Zalfa Abdel-Malek discussed two distinct signaling pathways activated by mitogens and UVB, respectively. The mitogen activated pathway involves the activation of the MAP kinase ERK1/2, and subsequently p90^{rsk} and the transcription factor CREB. Mitogens such as TPA, bFGF, and endothelin-1, but not α -MSH, activate this pathway, which is dependent on increasing intracellular Ca⁺² mobilization and activation of PKC and tyrosine kinases, but not cAMP formation. The UVB induced signaling pathway involves phosphorylation of CREB via a pathway independent of ERK1/2 or p90^{rsk}, but possibly dependent on the MAP kinase p38.

Sheila Mac Neil presented on the role of α -MSH in the defense of the skin against inflammation and oxidative stress. Earlier work from her laboratory showed that α -MSH inhibits the TNF- α induced ICAM-1 expression and NFK β activity. Recently, she and her coworkers reported that α -MSH inhibits the TNF- α and H₂O₂ induced activation of glutathione peroxidase. She concluded that several types of cells in the skin are capable of responding to α -MSH to overcome oxidative stress.

Elizabeth Pereira reported the results she has obtained in Zalfa Abdel-Malek's laboratory on the signaling pathways induced by UVB radiation or arsenic in human melanocytes and keratinocytes. UVB radiation induced a dose-dependent and prolonged accumulation of p53, and an increase in the expression of the cyclin-cdk inhibitor p21. Arsenic caused only a slight increase in p53, but extensive expression of p21. UVB radiation did not activate ERK1/2, while arsenic augmented the activation of ERK1/2 by mitogens. UVB radiation, but not arsenic induced the phosphorylation of p38.

Sumayah Jamal presented on the regulation of expression of the adhesion molecule E-cadherin by endothelin-1, a melanocyte mitogen that is secreted by keratinocytes. Loss of expression of E-cadherin results in dedifferentiation of melanocytes and expression of melanoma associated adhesion molecules, as well as loss of contact with keratinocytes. Endothelin-1 activates endothelin-B receptors on melanocytes and down-regulates E-cadherin by inducing its association with caspase-8. The ability of endothelin-1 to down-regulate E-cadherin, a tumor invasion suppressor, suggests a role for this hormone in enhancing melanoma invasion.

Masaki Yoshida described the mechanism by which histamine stimulates melanogenesis. In the brown guinea pig, topical application of famotidine, a H₂ antagonist, reduced the pigmentary effect of UVB radiation. Application of histamine, however, did not stimulate pigmentation. Irradiation of cultured human melanocytes with UVB radiation or treatment with histamine did not stimulate tyrosinase activity. Simultaneous treatment of melanocytes with UVB radiation and histamine stimulated tyrosinase activity. He concluded that UVB radiation might sensitize melanocytes to histamine.

Achim H-P Krauss reported on the responses of choroidal and cutaneous melanocytes to endothelin-1 and prostaglandin F₂α. Both types of melanocytes expressed the mRNA for the endothelin B receptor and for the FP receptors. The latter receptors were also observed by immunocytochemistry, and the G_iα, the G protein coupled to endothelin B and FP receptors, was detected by Western blotting. Surprisingly, only endothelin-1, but not PGF₂α, induced mobilization of intracellular Ca⁺² and increased DOPA oxidase activity and increased tyrosinase protein levels.

Peter Parsons presented on the effects of sunscreen chemicals on skin cells. He presented the results of a study that was conducted to determine the effects of such chemicals on the efficacy of sunscreens. Three sunscreens tested inhibited the proliferation of human skin cells but did not alter the expression of certain genes. UVA photosensitized o-PABA in melanocytes but not keratinocytes. The relevance of these *in vitro* findings on the action of sunscreens *in vivo* is to be determined.

Patrick Riley described a mathematical model that explains the kinetics of tyrosinase. The model explains the autoactivation kinetics of tyrosinase, whereby the enzyme with copper atoms in the active site in the Cu (II) state. The kinetics are consistent with the kinetics of mushroom tyrosinase *in vitro* and with the effects of known enzyme substrates.

Lessons Learned from Vitiligo.

Report by Caroline Le Poole Ph.D.

Our session opened with a brief discussion of vitiligo per se, highlighting the progressive loss of melanocytes, a varied age of onset, the infrequency of repigmentation and the existence of multiple clinical subforms, potentially reflecting different etiopathologies. The latter viewpoint was supported by quotes generously provided by vitiligo researchers not present at the meeting, stating that vitiligo is a disease deserving of further attention among pigment cell biologists and dermatologists alike. A current hypothesis was presented in which genetically compromised melanocytes are hampered in their response to environmentally imposed injury. Stressed melanocytes subsequently initiate intensive cross-talk with neighbouring keratinocytes, both cell types participating in the recruitment of an inflammatory infiltrate. Such infiltrates contain lymphocytes specifically reactive with melanocyte antigens, leading to premature apoptosis of target cells and thus to depigmentation.

Dr. Pranab Das (Amsterdam University) continued with compelling evidence in support of a Th1 mediated immune response in progressive margins of generalized vitiligo skin. The cytotoxic ability of infiltrating T cells was supported by granzyme/perforin staining of marginal skin sections. It was pointed out that most T cells will infiltrate the skin as Th0 cells, polarizing to a Th1 or Th2 phenotype in response to conditions encountered in the skin. On average 30% of T cells cloned from marginal skin biopsies were shown to be reactive with melanocytes, underscoring their importance for the disease process. A high frequency of Th1 cytokine profiles was noted

among these T cell clones. Interestingly, T cells cloned from marginal skin revealed a 2-10 fold increase in incidence of MART1-reactive T cells over PBL.

Dr. Gisela Erf (University of Arkansas) discussed the potential of the Smyth line chicken to study the autoimmune response in vitiligo. In this model, feather depigmentation will develop 6-12 weeks post-hatch. Among 3 haplotypes available, B101 appears the most useful for vitiligo research with a reported incidence of depigmentation of >70%. Consistent development of vitiligo implies the involvement of a genetic component. Interestingly, the cell-mediated immune component of the disease is well represented in the chicken model. Also, a susceptibility to environmental factors has been demonstrated by an increased incidence of vitiligo following immunization with live Marek's disease virus. The incidence of depigmentation decreases in the order SL, (parental line) BL and LBL. In BL chickens, depigmentation following exposure to 5-azacytidine increases to approximately 70%. This agent will inhibit DNA methylation and has been extensively shown to induce autoimmune disease. The agent was shown to increase the CD4/CD8 ratio in exposed birds (independent of depigmentation) and infiltrating T cells frequently express TCR2 rather than TCR1 or TCR3.

By way of introduction to the involvement of the immune response in loss of melanocytes, a short review was given into the role of melanocytes within the skin immune system. The phagocytic capacity of melanocytes in combination with a potential for antigen presentation suggest that participation of melanocytes in elimination of infectious agents penetrating the skin could lead to depigmentation, as often observed in tuberculoid leprosy. For example, melanocytes presenting immunodominant *M. leprae* HSP65 peptides may be killed by proliferative as well as cytotoxic CD4+T cells as innocent bystander cells. In the second part of his presentation, Dr. Das continued with a description of events leading to elimination of melanocytes by cytotoxic T cells. The process initiates by injury inflicted on melanocytes. Cells that die as a direct consequence are phagocytized by professional antigen presenting cells, that migrate to the lymph nodes, where cellular cross-talk is initiated involving cytokines and costimulatory molecules, which will determine the type of response to follow. Specific effector cells (T cells and/or B cells) then migrate to the initiating lesion where remaining melanocytes are subsequently killed.

The undersigned (**Dr. Caroline Le Poole**, Loyola University Chicago) then presented data relating to CDw60 expression in marginal skin from expanding generalized vitiligo lesions. Gangliosides expressing the CDw60 epitope are membrane molecules involved in multiple cell functions. In normal skin, expression is restricted to melanocytes and some neighbouring keratinocytes. Interestingly, it has previously been demonstrated that CDw60 expression by keratinocytes is regulated by Th1 versus Th2 cytokines. Here, data were shown indicating that expression by melanocytes is not regulated by exposure to such cytokines. Rather, melanocytes appear to secrete an autocrine and paracrine factor that will induce expression by neighbouring keratinocytes. The nature of this factor is under investigation. Interestingly, in 3 out of 5 patients examined, loss of melanocytes was accompanied by T cell infiltrates (indicative of progressive depigmentation) as well as by downregulation of epidermal CDw60 expression and induction of epidermal HLA-DR, both reflecting an active Th1 mediated immune response.

Dr Jim Nordlund (University of Cincinnati) ended the session with a discussion of his findings during an extensive stay in Moshi, Tanzania. There, Dr. Nordlund has seen patients with OCA-2 that exhibited UV-induced skin damage from 6 months of age. In the US, albinos typically develop BCCs or SCCs but curiously, not melanoma. Interestingly, several OCA-2 patients had developed solar lentigines. The nature of the mutation or mutations responsible for such reversion to melanogenesis are currently under investigation.

By contrast, patients with vitiligo exhibited marked solar elastosis but no actinic damage. Among patients with vitiligo, 69% had generalized vitiligo, 20% segmental, 6% localized and 5% showed involvement of the mucous membranes only. The mean age of onset was 29 years of age, one must however take into account that life expectancies are different from the US. In conclusion, the last word has not been said on the protective value of melanin against sun-induced skin damage and the lack thereof in vitiligo lesional skin.

In addition to the issues discussed in the vitiligo session, many interesting posters relating to the subject of vitiligo were on display throughout the meeting. There is obviously enough material for continued discussion on the subject of vitiligo. Perhaps at the next meeting?

Melanoma: New Genes, Gene Therapy and Animal Models I

Report by Meenhard Herlyn

The symposium "Melanoma: New Genes, Gene Therapy and Animal Models I" on June 26, 2000, at the Ninth Annual Meeting of the PASPCR in College Station, Texas, was co-chaired by Meenhard Herlyn and Dennis Roop. Dr. Herlyn opened the session by giving an overview of all animal models for melanoma published to date. In these models, melanomas develop spontaneously or after induction by chemical carcinogens (e.g. DMBA) and/or UV light. More recently transgenic mouse models for melanoma have been developed. As for human melanoma *in vivo*, the human skin xenograft/ immunodeficient mouse model gave rise to melanoma after topical DMBA treatment and chronic UVB irradiation of human foreskin. However, recent data of human adult skin grafts show that, in contrast to actinic non-melanoma skin cancer lesions, the incidence of melanocytic lesions is too low within the given protocol and time frame to make the model suitable for routine experimental studies.

Recently established organotypic cultures of pigmented human skin provide a new promising model for human melanoma *in vitro* and *in vivo* after grafting to immunodeficient animals. Genetic manipulation of the different types of normal skin cells as well as the inclusion of melanoma cells from different progression stages in these skin reconstructs enables well-defined and controlled long-term studies of melanoma development and progression in context with the microenvironment of skin.

Invited speaker **Lynda Chin** presented her progress on the transgenic mouse melanoma model in which the transgene H-RAS is expressed with the aid of melanocyte-specific tyrosinase gene promoter (Tyr-RAS) in mice with null mutations for the p16INK4 α and p19ARF gene (INK4 α D2/3 mutant). The lack of p53 mutations in these murine melanomas parallels the low incidence of p53 mutations in human melanomas. The importance of H-Ras expression for melanoma maintenance was shown by a doxycycline-inducible H-RasV12G INK4 α null mouse model. Withdrawal of doxycycline with concomitant down-regulation of H-Ras expression resulted in melanoma regression which could be converted upon new addition of doxycycline. The regression was characterized by apoptosis of tumor and endothelial cells. Although the regulation of VEGF was found to be Ras-dependent *in vitro*, *in situ* hybridization studies demonstrated an increase in VEGF expression in areas with reduced Ras expression.

The hypothesis that melanoma metastasis is initiated by the formation of host x tumor hybrids through fusion of macrophages with early stage melanoma cells was presented by **John Pawelek**. Motility and invasive capacity of metastatic melanoma cells resemble features of macrophages. Evidence for these hybrid cells comes from the analysis of a mouse lung metastasis found after implantation of murine Cloudman S91 melanoma cells in the tail of

a BALB/c mouse. This metastasis showed an increase in DNA content, a genotype of tyrosinase characteristic of both host and donor of the melanoma, more pigmentation, and more motility. The next objective is to prove the hypothesis in a human model.

Studies of the molecular genetics of melanoma in the *Xiphophorus* fish model were introduced by **Steven Kazianis**. Backcross hybrids homozygous for *Xmrk2*, a sex-linked tyrosine kinase related to EGF-Receptor, were generated and genetic mapping studies performed. The hybrid crosses enable also induction studies of melanoma by UV irradiation or chemical carcinogens like methyl-nitrosurea. A tumor suppressor candidate *CDKN2X*, similar to the mammalian *CDKN2* gene family including the loci for p16 and p15, was cloned, sequenced and characterized. In contrast to the human *CDKN2A* locus in melanoma, the fish *CDKN2X* locus is overexpressed in melanoma.

A new model of early transformation of human melanocytes *in vivo* was demonstrated by **Carola Berking**. Overexpression of β FGF in fibroblasts in human skin xenografts via intradermal injections of adenoviral vectors for the β FGF gene led to melanocyte proliferation and activation with increased pigmentation and melanocytic hyperplasia. The combination of β FGF expression and UVB irradiation induced a melanoma *in situ*-like lesion. Gene expression array studies of β FGF-transduced fibroblasts in collagen gels revealed an induction of ET-3 production which may have been the paracrine (co-)factor responsible for the melanocyte changes.

Mohamed Gamei presented a new clinical therapy for pigmented lesions. He treated acquired melanocytic nevi with a Q-switched ruby laser and had best cosmetic results in flat lesions with complete response and no recurrence. The laser targets the pigment in melanosomes and seems most suitable for junctional melanocytic nevi.

Latest technologies for melanoma gene expression analysis were employed by **Zhiqiang Wang**. A *Monodelphis domestica* non-metastatic melanocytic cell line was compared with a metastatic melanoma cell line by cDNA microarray and differential display. Metastasis-related genes of the metalloproteinase family were up-regulated and tissue inhibitors of metalloproteinases were down-regulated. Dysregulation of melanogenesis-specific genes were associated with activation of Ras-related oncogenes.

An overview of the melanoma cell-cell and cell-stroma interactions was given by **Meenhard Herlyn**. A wide variety of growth factors and cytokines function in an autocrine and/or paracrine manner to stimulate tumor growth, angiogenesis, stroma formation, adhesion, motility and invasion. Among these factors are β FGF, IGF-1, VEGF, PDGF, MCP-1, and IL-8. While IGF-1 is not produced by melanoma cells themselves, they express the IGF receptor and receive paracrine stimulation via IGF-1 secretion by surrounding fibroblasts. The angiogenic potency of IL-8, VEGF, β FGF, PDGF, and also MCP-1 is well established, however, experimental studies reveal that the amount of production is of utmost importance. While low concentrations of MCP-1 promote tumor growth and angiogenesis, higher expression levels can induce tumor necrosis due to macrophage infiltration. Similarly, too high IL-8 levels may induce neutrophil infiltrations with toxic effects on the tumor.

The importance of cell adhesion molecules in melanoma progression can be demonstrated in skin reconstructs. Early stage non-invasive melanoma cells become aggressive and invade into the dermis after experimental overexpression of melanoma cell adhesion molecule, Mel-CAM/Muc-18. Disruption of melanoma cell-melanoma cell and melanoma cell-fibroblast interactions by down-regulation of N-cadherin and the re-expression of the keratinocyte-melanocyte adhesion molecule E-cadherin in melanoma cells can abrogate malignant properties and reestablish a homeostatic balance between the different cell types.

The Sinclair swine model of melanoma was introduced by invited speaker **Max Amoss**. At least three loci have been linked to the inheritance and expression of melanoma in this model. The swines develop heritable melanoma at early age and either die from complications of multisystemic metastasis or survive due to spontaneous tumor regression. This regression is accompanied by depigmentation, i.e. vitiligo, and may be mediated by infiltrating macrophages and CD8+ T-lymphocytes, however, the exact mechanism is not yet understood.

Symposium: Melanoma: New Genes, Gene Therapy and Animal Models II

Report by Dot Bennett

The expansion of this topic into a second session gave us two more invited and 7 platform talks on a variety of interesting themes. In his invited talk, **Menashe Bar-Eli** (MD Anderson Center) gave a fascinating update on the potential role of transcription factor AP2 in melanoma progression. AP2 is expressed in neural crest and its products including melanocytes, but is commonly lost in metastatic melanomas. AP2 regulates several genes important in melanoma, including upregulation of the SCF receptor KIT (also commonly lost in advanced melanomas), and downregulation of adhesion molecule MUC18/Mel-CAM (consistently overexpressed in metastatic melanomas). Re-expression of exogenous AP2 in melanoma cells was associated with reduced tumor growth and lung colony formation. Thus AP2 downregulation may be a central event in melanoma progression. (So what regulates AP2?)

Keynote speaker **Oswaldo Podhajcer** (Buenos Aires) discussed the role of SPARC (secreted protein, acidic and rich in cysteine) in melanoma. SPARC is a matrix-associated protein found in growing or remodelling tissues including some carcinomas. He reported a remarkable association of SPARC with melanoma, namely expression in all tested melanomas of all stages, but in no melanocytes. Expression of a SPARC antisense sequence in a highly malignant melanoma line was followed by reduced tumor growth with altered cytokine levels and massive infiltration by neutrophils. Evidence was mentioned for melanoma cell killing by neutrophils in culture, and this was suggested as a mechanism for tumor cell destruction. (Again, one wonders what regulates SPARC.)

The first three platform talks were interrelated. **S. Pavel** (Leiden), discussed a multiple melanoma patient with not only 2 copies of a deletion in the melanoma susceptibility gene *INK4A /CDKN2A* but also a glucose-6-phosphate dehydrogenase (G6PD) deficiency. Since another member of the family also had homozygous deletions in *CDKN2A*, but no melanoma, it was suggested that the G6PD deficiency, expected to increase oxidative stress in cells, might contribute to the occurrence of melanoma. Other genetic contributing factors were not excluded. Next, **D. Bandopadhyay** (Houston) reviewed changes in gene expression seen in senescent melanocytes. She then described attempts to immortalize human melanocytes with hTERT (telomerase catalytic subunit), as reported for fibroblasts. Some hTERT-expressing clones apparently senesced, while others grew and appeared immortal. The growing clones may have undergone spontaneous genetic change, as downregulation of p16, one product of the *CDKN2A* locus, was observed. Moreover, **D. Bennett** (London) then reported that two human melanocyte strains null for p16 function, one from Dr Pavel's patient, could be immortalized en masse by hTERT, although not by tested viral oncogenes. Both talks suggested that deficiency of the p16/RB pathway was necessary as well as hTERT expression for human melanocyte immortalization - a step in melanoma development.

The other four talks were concerned with abnormalities of gene and protein expression in melanoma. Such information may lead to new therapeutic targets as well as aiding our understanding of the disease. **C. LePoole**

(Chicago) discussed potential immune escape by downregulation of antigenic melanosomal proteins like gp100/SILV, MART1 and TYRP1 by melanoma cells. Interestingly such downregulation resulted experimentally on exposure to interferon α , with reduced cell lysis by a MART1 specific T-cell clone. **P. Das** (Amsterdam) mentioned that dysplastic but not benign nevi also show antigen loss. He then reported the use of PCR-based subtractive hybridization to look for transcriptional differences between nevi and malignant melanoma cells. Candidate sequences included Rab5a, which may be downregulated during progression. **D. Easty** (Dublin) introduced a new RT-PCR survey of protein tyrosine phosphatases (PTPs) expressed in melanocytes and melanoma. Many oncogenes are protein tyrosine kinases, so PTPs are potential tumor suppressor genes. 15 PTPs were identified in pigment cells, and two related PTPs appeared to be downregulated in some melanomas, including PTP κ , which maps to chromosome 6q, a site of consistent chromosomal aberrations in melanoma. Lastly, **W. Xu** (Houston) gave a potential functional explanation for consistent overexpression of transcriptional repressor SKI in melanoma. Interaction of SKI with Smad proteins was reported. Smads are transcriptional activators and mediators of TGF β responses. TGF β inhibits growth of melanocytes, but SKI overexpression prevented this growth inhibition. This potentially explains why melanoma cell growth is often not repressed by TGF β .

Melanosomal Genesis, function and transfer.

Report by Glynis Scott

The session on inter/intracellular signaling pathways in melanocytes was opened by Dr. Nishikawa who spoke about the microenvironment control of melanocyte migration and localization to the hair follicle. Their studies on the role of stem cell factor (SCF), c-kit and endothelin-1 show that SCF and ET-1 are critical growth factors for the localization of melanocytes to the skin. Their studies show that E-cadherin levels increase in melanocytes prior to entry of the melanocytes to the epidermis, and that this increase in expression is highly synchronized. They also show that overexpression of SCF through the use of transgenic mice results in population of melanocytes in the interfollicular areas. Dr. Nishikawa and co-workers show that the soluble and the membrane bound forms of SCF have differing functions in hematopoietic and future work in their laboratory will focus on defining the effects of the soluble Vs membrane bound SCF on melanocyte migration and localization to the skin.

Dr. Raymond Boissy summarized our current understanding of Hermansky Pudlak (HP) syndrome as well as his most recent findings regarding melanosome biogenesis. Melanosome biogenesis involves the formation of coated vesicles that tether, dock and fuse to late endosomes. The gene for HP syndrome type I has been mapped to chromosome 10q23.1-3, but the function of the protein is unknown. The protein forms a 200 kDa and sometimes 500 kDa complex, is not a glycoprotein and is not a transmembrane protein. HP syndrome type II is due to a defect in the adaptor β 3 subunit. In melanocytes from patients with HPS type I Dr. Boissy and colleagues have observed the presence of a "membranous complex" by electron microscopy. Melanocytes from patients with HPS II exhibit many late endosomes. There appears to be impaired trafficking into or out of this late endosome. Thus, HP syndrome may be understood as a disorder in melanosome biogenesis through at least 2 different pathways.

Dr. Miri Seiberg presented data to show that protease activated receptor-2 (PAR-2) is involved in melanosome transfer to keratinocytes through increased keratinocyte phagocytosis. PAR-2 is activated by cleavage by serine proteases. In epidermal equivalents agonists of PAR-2 induced pigmentation through increased uptake of melanosomes by keratinocytes. Conversely, they showed that inhibitors of PAR-2 reduced pigmentation through inhibition of melanosome uptake. PAR-2 inhibition also functions as a feedback loop to inhibit TRP-1 transcription, and to unregulate TRP-2 transcription. Finally, Dr. Seiberg also showed that PAR-2 activation alters the actin cytoskeleton in keratinocytes, and that PAR-2 activation results in protease secretion.

Dr. Ruth Halaban presented data showing that tyrosinase-negative albinism is due to endoplasmic reticulum retention of tyrosinase. Dr. Halaban and colleagues analyzed several mutant tyrosinases and followed the intracellular localization by tagging these mutants with green fluorescent protein in murine melanocytes. They also examined the enzymatic properties of the mutant proteins and their subcellular localization. They found that the albino mutant tyrosinase is retained in the ER and is a misfolded protein that is associated with the chaperone proteins calnexin and calreticulin.

Dr. Toyofuku presented data showing that mutant tyrosinases from patients with OCA IA or IB, when transfected into COS7 cells, were retained in the ER stably associated with calnexin. These mutant tyrosinases were also shown to be degraded faster than wild type tyrosinase.

Dr. Virador presented data analyzing the process of melanosome transfer to keratinocytes. Dr. Virador and colleagues used several different model systems to analyze this process. Using fluorescent beads they showed that bead uptake by keratinocytes is determined by the size of the bead. Using time lapse video microscopy they showed that one method of melanosome transfer involves insertion of the melanocyte dendrite under the keratinocyte. Finally, treatment of melanocytes with MSH resulted in release of melanosomes into the media within 6 hours and increased blebbing of the melanocyte membrane.

Dr. Manga presented data analyzing the function of the pink eyed dilution locus in melanosome biogenesis. Mutations in the p locus are a major cause of albinism. Dr. Manga and colleagues used EM to study the localization of tyrosinase in murine p-null cells (melan-p1) and wild type (melan-a) cells. By EM they show that in the absence of p, tyrosinase accumulates in small vesicles throughout the cell. They also show that tyrosinase is secreted in melan-p1 melanocytes and that the observed secretion is due to proteolysis of the abnormally processed tyrosinase. Dr. Manga and colleagues hypothesize that the p protein may function to stabilize the melanosomal complex and aid in transport of melanosomal proteins.

Dr. Manwalla examined the role of lectins and neoglycoproteins in melanosome transfer to keratinocytes. Lectins are involved in membrane recognition events, and lectin expression is upregulated by UV light. They used co-cultures of melanocytes and keratinocytes and a dye (CFDA) as a marker for melanosomes. Using this model system they showed that neoglycoproteins were more effective in inhibiting dye transfer to keratinocytes than lectins. They also counted the number of melanosomes in the cytoplasm of keratinocytes in the presence of inhibitors of lectins or neoglycoproteins and showed similar results. Finally, they analyzed the factors that contribute to localization of melanosomes in the keratinocytes and show that it is the keratinocyte (i.e. black Vs white) that determines melanosome localization rather than the size of the melanosome granule.

Ms. MC Scott presented data on the regulation of expression of the MC1 receptor in melanocytes from different pigmentary phenotypes. They showed that the increase in MC1R mRNA levels in response to MSH was more pronounced in melanocytes with low melanin content than in dark melanocytes. Basic FGF upregulated MC1R mRNA levels in dark melanocytes but reduced levels in melanocytes with low melanin content. They also showed differences in MC1R mRNA levels in lightly pigmented Vs darkly pigmented melanocytes in response to TPA, and to combinations of estrogen and MSH. These differences MC1R regulation in dark and light melanocytes suggests differential regulation of MC1R gene expression in people of different pigmentary phenotypes.

Positions - Wanted and Available :

Principal Scientist- Clinical Research - Skin Science Research

Unilever employs over 200 scientists at our New Jersey Laboratory who are dedicated to innovative and scientifically rigorous skin research programs. Our world sales exceed \$40 billion so our programs have solid financial funding allowing for an innovative and challenging research culture. We currently have a full time opening that provides a unique opportunity to apply your basic science skills to human studies that impact the condition of skin for hundreds of millions people worldwide. We are seeking an expert in pigment biology or photobiology who can advance our knowledge and link laboratory research to clinically defined improvements of consumer skin problems. As a member of our skin research team, you will have an opportunity to work with other scientific experts in many fields including cell biology, biochemistry, measurement science and physical chemistry. You will also be encouraged to establish and maintain close ties to research in academic and government research communities.

We offer a competitive salary, benefits including tuition assistance and relocation, and a dynamic environment filled with learning and discovery beyond conventional scientific boundaries. Applicants must be authorized to work in the USA. For consideration please forward your CV to: Human Resources, Dept. CR-SID, Unilever Research US, 45 River Road, Edgewater, NJ 07020 or E-Mail: job.mca@unilever.com . Please place only the letters "CR-SID" as the subject of your e-mail. Unilever is an Equal Opportunity Employer m/f/d/v.

Postdoctoral Fellows - Cancer and Developmental Biology - Two NIH-funded positions are available for fellows interested in studying the Hedgehog signaling pathway in development and disease using skin as a model system. One project centers on defining the function of the Hedgehog pathway during skin appendage morphogenesis (Dev. Biol. 205: 1-9, 1999); a second project focuses on understanding how deregulated activation of this pathway gives rise to basal cell carcinomas (Nature Genet. 24: 216-7, 2000). Applicants should have a solid background in molecular and cell biology, with experience in transgenic animal models desirable but not required. Interested individuals should send a CV, letter of interest, and names of three references to: Dr. Andrzej Dlugosz, University of Michigan, Department of Dermatology and Comprehensive Cancer Center, 3310 CCGC, Box 0932, 1500 East Medical Center Drive, Ann Arbor, MI 48109-0932 Email: dlugosza@umich.edu. The University of Michigan is an Equal Opportunity Employer.

Postdoctoral Research Associate - Position available to study the biology of human inherited disorders of pigmentation using gene transfer technology. The successful applicant will have a Ph.D. and/or M.D. with experience in cell biology and molecular biology. Experience in gene transfer/genome manipulation is preferred. Please send curriculum vitae along with the names of three references to Dr. Richard King, Division of Genetics, Department of Medicine, Box 485 Mayo, 420 Delaware St. S.E., University of Minnesota, Minneapolis, MN 55455. Equal Opportunity Employer.

Postdoctoral Position - Ph.D. in molecular biology, biophysics, genetics or biochemistry. Position available to conduct research on molecular mechanisms of cellular response to oxidative stress in human melanocytes and melanoma cells and its regulation for preventive and therapeutic indications. Contact Dr. Frank L. Meyskens Jr., Director, University of California-Irvine, Chao Family Clinical Cancer Research Center, 101 The City Drive, Orange, CA 92668, USA. Fax (714) 456-5039 Email flmeyske@uci.edu

Bibliography :

The Bibliography published in this issue covers the period May through July, 2000. If you notice a paper that was not detected by this search that should be included, please send it to us and we will include it in the next issue. By its very nature, assignment of a reference to a particular category is arbitrary and we urge you to read through all categories to make sure you don't miss any pertinent to your field. We have attempted to highlight any publications which include a member of the PASPCR with a star (*sorry if we missed you but let us know and you'll get a free marked repeat in the next issue*).

MELANINS, MELANOGENS & MELANOGENESIS

- Akeo K, Amaki S, Suzuki T, Hiramitsu T: Melanin granules prevent the cytotoxic effects of L-DOPA on retinal pigment epithelial cells in vitro by regulation of NO and superoxide radicals. *PIGM CELL RES* 13:80-88 (2000).
- Chen C, Zhu YF, Wilcoxon K: An improved synthesis of selectively protected L-Dopa derivatives from L-tyrosine. *J ORG CHEM* 65:2574-2576 (2000).
- Eckhart L, Bach J, Ban J, Tschachler E: Melanin binds reversibly to thermostable DNA polymerase and inhibits its activity. *BIOCHEM BIOPHYS RES COMMUN* 271:726-730 (2000).
- Frangioni G, Borgioli G, Bianchi S, Pillozzi S: Relationships between hepatic melanogenesis and respiratory conditions in the newt, *Triturus carnifex*. *J EXP ZOOL* 287:120-127 (2000).
- Gallas JM, Zajac GW, Sarna T, Stotter PL: Structural differences in unbleached and mildly-bleached synthetic tyrosine-derived melanins identified by scanning probe microscopies. *PIGM CELL RES* 13:99-108 (2000).
- Hegedus ZL: The probable involvement of soluble and deposited melanins, their intermediates and the reactive oxygen side-products in human diseases and aging. *TOXICOLOGY* 145:85-101 (2000).
- Ilija M, Jeffery G: Retinal cell addition and rod production depend on early stages of ocular melanin synthesis. *J COMP NEUROL* 420:437-444 (2000).
- Jennings LD, Rayner DR, Jordan DB, Okonya JF, Basarab GS, Amorose DK, Anaclerio BM, Lee JK, Schwartz RS, Whitmore KA: Cyclobutane carboxamide inhibitors of fungal melanin: Biosynthesis and their evaluation as fungicides. *BIOORGAN MED CHEM* 8:897-907 (2000).
- Kalka K, Mukhtar H, Turowski-Wanke A, Merk H: Biomelanin antioxidants in cosmetics: Assessment based on inhibition of lipid peroxidation. *SKIN PHARMACOL APPL SKIN PHYS* 13:143-149 (2000).
- Lazarovits G, Starratt AN, Huang HC: The effect of tricyclazole and culture medium on production of the melanin precursor 1,8-dihydroxynaphthalene by *Sclerotinia sclerotiorum* isolate SS7. *PESTIC BIOCHEM PHYSIOL* 67:54-62 (2000).
- Li LXL, Crotty KA, Kril JJ, McCarthy SW, Palmer AA: Effect of melanin bleach on Feulgen-DNA microdensitometry in pigmented lesions. *ANAL QUANT CYTOL HISTOL* 22:150-154 (2000).
- Mieczkowski T: Is a "color effect" demonstrated for hair analysis of carbamazepine? *LIFE SCI* 67:39-43 (2000).
- Mosse I, Kostrova L, Subbot S, Maksimenya I, Molophei V: Melanin decreases clastogenic effects of ionizing radiation in human and mouse somatic cells and modifies the radioadaptive response. *RADIAT ENVIRON BIOPHYS* 39:47-52 (2000).
- Nakano T, Miyake K, Ikeda M, Mizukami T, Katsumata R: Mechanism of the incidental production of a melanin-like pigment during 6-demethylchlortetracycline production in *Streptomyces aureofaciens*. *APPL ENVIRON MICROBIOL* 66:1400-1404 (2000).
- Napolitano A, Vincenzi MR, DiDonato P, Monfrecola G, Prota G: Microanalysis of melanins in mammalian hair by alkaline hydrogen peroxide degradation: Identification of a new structural marker of pheomelanins. *J INVEST DERMATOL* 114:1141-1147 (2000).
- Nappi AJ, Vass E: Iron, metalloenzymes and cytotoxic reactions. *CELL MOL BIOL* 46:637-647 (2000).
- Nappi AJ, Ottaviani E: Cytotoxicity and cytotoxic molecules in invertebrates. *BIOESSAYS* 22:469-480 (2000).
- Nataf V, LeDouarin NM: Induction of melanogenesis by tetradecanoylphorbol-13 acetate and endothelin 3 in embryonic avian peripheral nerve cultures. *PIGM CELL RES* 13:172-178 (2000).
- Nofsinger JB, Forest SE, Eibest LM, Gold KA, Simon JD: Probing the building blocks of eumelanins using scanning electron microscopy. *PIGM CELL RES* 13:179-184 (2000).
- Nosanchuk JD, Rosas AL, Lee SC, Casadevall A: Melanisation of *Cryptococcus neoformans* in human brain tissue. *LANCET* 355:2049-2050 (2000).
- Palumbo A, Poli A, DiCosmo A, d'Ischia M: N-methyl-D-aspartate receptor stimulation activates tyrosinase and promotes melanin synthesis in the Ink gland of the cuttlefish *Sepia officinalis* through the nitric oxide/cGMP signal transduction pathway - A novel possible role for glutamate as physiologic activator of melanogenesis. *J BIOL CHEM* 275:16885-16890 (2000).
- Rosas AL, Nosanchuk JD, Feldmesser M, Cox GM, McDade HC, Casadevall A: Synthesis of polymerized melanin by *Cryptococcus neoformans* in infected rodents. *INFECTION IMMUNITY* 68:2845-2853 (2000).
- Shriver MD, Parra EJ: Comparison of narrow-band reflectance spectroscopy and tristimulus colorimetry for measurements of skin and hair color in persons of different biological ancestry. *AMER J PHYS ANTHROPOL* 112:17-27 (2000).
- Simon JD: Spectroscopic and dynamic studies of the epidermal chromophores trans-urocanic acid and eumelanin. *ACCOUNT CHEM RES* 33:307-313 (2000).

- ❖ Sugumarán M, Nellaiappan K, Amaratunga C, Cardinale S, Scott T: Insect melanogenesis - III. Metabolon formation in the melanogenic pathway - Regulation of phenoloxidase activity by endogenous dopachrome isomerase (decarboxylating) from *Manduca sexta*. ARCH BIOCHEM BIOPHYS 378:393-403 (2000).
- Takizawa Y, Kato S, Matsunaga J, Aozaki R, Tomita Y, Nishikawa T, Shimizu H: Electron microscopic DOPA reaction test for oculocutaneous albinism. ARCH DERMATOL RES 292:301-305 (2000).
- Wheeler M, Guerrero-Plata A, Rico G, Torres-Guerrero H: Biosynthesis and functions of melanin in *Sporothrix schenckii*. INFEC IMMUNITY 68:3696-3703 (2000).
- Zhang XY, Erb C, Flammer J, Nau WM: Absolute rate constants for the quenching of reactive excited states by melanin and related 5,6-dihydroxyindole metabolites: Implications for their antioxidant activity. PHOTOCHEM PHOTOBIOLOG 71:524-533 (2000).

MELANOCYTES & KERATINOCYTES

- Armstrong TN, Cronin TW, Bradley BP: Microspectrophotometric analysis of intact chromatophores of the Japanese medaka, *Oryzias latipes*. PIGM CELL RES 13:116-119 (2000).
- Ascierto PA, Palmieri G, Celentano E, Parasole R, Caracia C, Daponte A, Chiofalo MG, Melucci MT, Mozzillo N, Satriano RA, Castello G: Sensitivity and specificity of epiluminescence microscopy: evaluation on a sample of 2731 excised cutaneous pigmented lesions. BRIT J DERMATOL 142:893-898 (2000).
- Atit RP, Mitchell K, Nguyen L, Warshawsky D, Ratner N: The neurofibromatosis type 1 (Nf1) tumor suppressor is a modifier of carcinogen-induced pigmentation and papilloma formation in C57BL/6 mice. J INVEST DERMATOL 114:1093-1100 (2000).
- Braun RP, Saurat JH, Krischer J: Hypoluminescence microscopy of pigmented skin lesions. MELANOMA RES 10:141-144 (2000).
- Busca R, Ballotti R: Cyclic AMP a key messenger in the regulation of skin pigmentation. PIGM CELL RES 13:60-69 (2000).
- Busca R, Abbe P, Mantoux F, Aberdam E, Peyssonnaud C, Eychelle A, Ortonne JP, Ballotti R: Ras mediates the cAMP-dependent activation of extracellular signal-regulated kinases (ERKs) in melanocytes. EMBO J 19:2900-2910 (2000).
- Byers HR, Yaar M, Eller MS, Jalbert NL, Gilchrist BA: Role of cytoplasmic dynein in melanosome transport in human melanocytes. J INVEST DERMATOL 114:990-997 (2000).
- Cario-Andres M, Bessou S, Gontier E, Maresca V, Picardo M, Taieb A: The reconstructed epidermis with melanocytes: a new tool to study pigmentation and photoprotection (vol 45, pg 936, 1999). CELL MOL BIOL 46:489-489 (2000).
- Chen T, Dong H, Yong R, Duncan MJ: Pleiotropic pigmentation mutants of *Porphyromonas gingivalis*. MICROB PATHOG 28:235-247 (2000).
- delosMonteros AE, delasMulas JM, Fern? dez A, Or? J, Rodriguez F: Immunohistopathologic characterization of a dermal melanocytoma-acanthoma in a German shepherd dog. VET PATHOL 37:268-271 (2000).
- Edwards SL, Blessing K: Problematic pigmented lesions: approach to diagnosis. J CLIN PATHOL 53:409-418 (2000).
- Franchi J, Coutadeur MC, Marteau C, Mersel M, Kupferberg A: Depigmenting effects of calcium D-pantetheine-S-sulfonate on human melanocytes. PIGM CELL RES 13:165-171 (2000).
- Fрати C, Marchese C, Fisichella G, Copani A, Nasca MR, Storto M, Nicoletti F: Expression of functional mGlu5 metabotropic glutamate receptors in human melanocytes. J CELL PHYSIOL 183:364-372 (2000).
- Fukuda T, Igarashi T, Hiraki H, Yamaki T, Baba K, Suzuki T: Abnormal pigmentation of schwannoma attributed to excess production of neuromelanin-like pigment. PATHOL INT 50:230-237 (2000).
- Fukuzawa T: Melanophore lineage and clonal organization of the epidermis in *Xenopus* embryos as revealed by expression of a biogenic marker, GFP. PIGM CELL RES 13:151-157 (2000).
- Halliday GM, Robertson BO, Barnetson RS: Topical retinoic acid enhances, and a dark tan protects, from subdermal solar-simulated photocarcinogenesis. J INVEST DERMATOL 114:923-927 (2000).
- Hann SK, Kim YS, Yoo JH, Chun YS: Clinical and histopathologic characteristics of trichrome vitiligo. J AMER ACAD DERMATOL 42:589-596 (2000).
- Hirobe T, Abe H: ACTH(4-12) is the minimal message sequence required to induce the differentiation of mouse epidermal melanocytes in serum-free primary culture. J EXP ZOOL 286:632-640 (2000).
- Huard B, Karlsson L: A subpopulation of CD8(+) T cells specific for melanocyte differentiation antigens expresses killer inhibitory receptors (KIR) in healthy donors: evidence for a role of KIR in the control of peripheral tolerance. EUR J IMMUNOL 30:1665-1675 (2000).
- Iwata F, Reed GF, Caruso RC, Kuehl EM, Gahl WA, Kaiser-Kupfer MI: Correlation of visual acuity and ocular pigmentation with the 16-bp duplication in the HPS-1 gene of Hermansky-Pudlak syndrome, a form of albinism. OPHTHALMOLOGY 107:783-789 (2000).
- Jordan S, Beermann F: Nomenclature for identified pigmentation genes in the mouse. PIGM CELL RES 13:70-71 (2000).
- Jungbluth AA, Iversen K, Coplan K, Kolb D, Stockert E, Chen YT, Old LJ, Busam K: T311 - An anti-tyrosinase monoclonal antibody for the detection of melanocytic lesions in paraffin embedded tissues. PATHOL RES PRACT 196:235-242 (2000).
- Kim IS, Kima ER, Nam HJ, Chin MO, Moon YH, Oh MR, Yeo UC, Song SM, Kim JS, Uhm MR, Beck NS, Jin DK: Activating mutation of GS α in McCune-Albright syndrome causes skin pigmentation by tyrosinase gene activation on affected melanocytes. HORMONE RES 52:235-240 (1999).
- Kim NS, Cho JH, Kang WH: Behavioral differences between donor site-matched adult and neonatal melanocytes in culture. ARCH DERMATOL RES 292:233-239 (2000).
- Lee HJ, Ha SJ, Lee SJ, Kim JW: Melanocytic nevus with pregnancy-related changes in size accompanied by apoptosis of nevus cells: A case report. J AMER ACAD DERMATOL 42:936-938 (2000).
- Lenane P, Keane CO, Connell BO, Loughlin SO, Powell FC: Genital melanotic macules: Clinical, histologic, immunohistochemical, and ultrastructural features. J AMER ACAD DERMATOL 42:640-644 (2000).
- Ley RD, Reeve VE, Kusewitt DF: Photobiology of *Monodelphis domestica*. DEVELOP COMP IMMUNOL 24:503-516 (2000).

- LoRusso FJ, Boniuk M, Font RL: Melanocytoma (magnocellular nevus) of the ciliary body: Report of 10 cases and review of the literature. *OPHTHALMOLOGY* 107:795-800 (2000).
- Lubics A, Schneider I, Sebok B, Havass Z: Extensive bluish gray skin pigmentation and severe arthropathy - Endogenous ochronosis (alkaptonuria). *ARCH DERMATOL* 136:548-+ (2000).
- Naldi L, Imberti GL, Parazzini F, Gallus S, LaVecchia C: Pigmentary traits, modalities of sun reaction, history of sunburns, and melanocytic nevi as risk factors for cutaneous malignant melanoma in the Italian population - Results of a collaborative case-control study. *CANCER* 88:2703-2710 (2000).
- Nilsson H: Melanosome and erythroosome positioning regulates cAMP-induced movement in chromatophores from spotted triplefin, *Grahamina capito*. *J EXP ZOOL* 287:191-198 (2000).
- Peters S, Kayatz P, Heimann K, Schraermeyer U: Subretinal injection of rod outer segments leads to an increase in the number of early-stage melanosomes in retinal pigment epithelial cells. *OPHTHALMIC RES* 32:52-56 (2000).
- Piepkorn M: The expression of p16(INK4a), the product of a tumor suppressor gene for melanoma, is upregulated in human melanocytes by UVB irradiation. *J AMER ACAD DERMATOL* 42:741-745 (2000).
- Prota G, Vincenzi MR, Napolitano A, Selen G, Stjernschantz J: Latanoprost stimulates eumelanogenesis in iridial melanocytes of cynomolgus monkeys. *PIGM CELL RES* 13:147-150 (2000).
- ❖ Quevedo WC, Holstein TJ, Dyckman J, McDonald CJ: The responses of the human epidermal melanocyte system to chronic erythemal doses of UVR in skin protected by topical applications of a combination of vitamins C and E. *PIGM CELL RES* 13:190-192 (2000).
 - ❖ Quevedo WC, Holstein TJ, Dyckman J, McDonald CJ, Isaacson EL: Inhibition of UVR-Induced tanning and immunosuppression by topical applications of vitamins C and E to the skin of hairless (hr/hr) mice. *PIGM CELL RES* 13:89-98 (2000).
- Raff SB, Carney JA, Krugman D, Doppman JL, Stratakis CA: Prolactin secretion abnormalities in patients with the "syndrome of spotty skin pigmentation, myxomas, endocrine overactivity and schwannomas" (Carney complex). *J PEDIATR ENDOCRINOL METAB* 13:373-379 (2000).
- ❖ Rollag MD, Provencio I, Sugden D, Green CB: Cultured amphibian melanophores: A model system to study melanopsin photobiology. *VERTEBRATE PHOTOTRANSDUCTION AND THE VISUAL CYCLE, PT B*. 291-309 (2000).
- Rongioletti F, Rebora A: Acquired brachial cutaneous dyschromatosis: A common pigmentary disorder of the arm in middle-aged women. *J AMER ACAD DERMATOL* 42:680-684 (2000).
- Rudolph P, Schubert C, Tamm S, Heidorn K, Hauschild A, Michalska I, Majewski S, Krupp G, Jablonska S, Parwaresch R: Telomerase activity in melanocytic lesions - A potential marker of tumor biology. *AMER J PATHOL* 156:1425-1432 (2000).
- Salceda R, Sanchez-Chavez G: Calcium uptake, release and ryanodine binding in melanosomes from retinal pigment epithelium. *CELL CALCIUM* 27:223-229 (2000).
- ❖ Scarparo AC, Visconti MA, deOliveira AR, Castrucci AMD: Adrenoceptors in normal and malignant human melanocytes. *ARCH DERMATOL RES* 292:265-267 (2000).
 - ❖ Setaluri V: Sorting and targeting of melanosomal membrane proteins: Signals, pathways, and mechanisms. *PIGM CELL RES* 13:128-134 (2000).
- Sommer S, Sheehan-Dare RA: Pulsed dye laser treatment of port-wine stains in pigmented skin. *J AMER ACAD DERMATOL* 42:667-671 (2000).
- Takeda Y: Existence and distribution of melanocytes and HMB-45-positive cells in the human minor salivary glands. *PATHOL INT* 50:15-19 (2000).
- Tremblay JF, O'Brien EA, Chauvin PJ: Melanoma in situ of the oral mucosa in an adolescent with dysplastic nevus syndrome. *J AMER ACAD DERMATOL* 42:844-846 (2000).
- Welker P, Schadendorf D, Artuc M, Grabbe J, Henz BM: Expression of SCF splice variants in human melanocytes and melanoma cell lines: potential prognostic implications. *BRIT J CANCER* 82:1453-1458 (2000).
- Zhu H, Reuhl K, Botha R, Ryan K, Wei J, Chen SZ: Development of early melanocytic lesions in transgenic mice predisposed to melanoma. *PIGM CELL RES* 13:158-164 (2000).

MELANOMA & METASTASIS

- Acland KM, O'Doherty MJ, Russell-Jones R: The value of positron emission tomography scanning in the detection of subclinical metastatic melanoma. *J AMER ACAD DERMATOL* 42:606-611 (2000).
- Ak I, Stokkel MPM, Bergman W, Pauwels EKJ: Cutaneous malignant melanoma: clinical aspects, imaging modalities and treatment. *EUR J NUCL MED* 27:347-358 (2000).
- Allouch H: Cyclotrons in cancerology: proton therapy applied to uveal melanoma. *PRESSE MEDICALE* 29:841-+ (2000).
- Arienti F, Belli F, Napolitano F, Sul Colombo MP, Cascinelli N, Maio M, Parmiani G: Vaccination of melanoma patients with interleukin 4 gene-transduced allogeneic melanoma cells (vol 10, pg 2907, 1999). *HUM GENE THER* 11:981-981 (2000).
- Ascierto PA, Palmieri G, Strazzullo M, Daponte A, Botti G, Satriano SMR, Motti ML, Mozzillo N, Castello G: Low doses interferon- α in the treatment of high-risk cutaneous melanoma. *ANN ONCOL* 11:487-490 (2000).
- Banerjee SS, Harris M: Morphological and immunophenotypic variations in malignant melanoma. *HISTOPATHOLOGY* 36:387-402 (2000).
- Bardeesy N, Wong KK, DePinho RA, Chin L: Animal models of melanoma: Recent advances and future prospects. *ADVANCES IN CANCER RESEARCH, VOL 79*. 123-156 (2000).
- Bastian BC, Kashani-Sabet M, Hamm H, Godfrey T, Moore DH, Brocker EB, LeBoit PE, Pinkel D: Gene amplifications characterize acral melanoma and permit the detection of occult tumor cells in the surrounding skin. *CANCER RES* 60:1968-1973 (2000).
- Baudrier-Ronier A, Bodenant C, Proust F, Delangre T, Hemet J, Laquerriere A: An isochromosome 6p in a primary meningeal malignant melanoma. *CANCER GENET CYTOGENET* 119:80-82 (2000).

- Baurain JF, Colau D, vanBaren N, Landry C, Martelange V, Vikkula M, Boon T, Coulie PG: High frequency of autologous anti-melanoma CTL directed against an antigen generated by a point mutation in a new helicase gene. *J IMMUNOL* 164:6057-6066 (2000).
- Benelli C, Roscetti E, DalPozzo V: The dermoscopic (7FFM) versus the clinical (ABCDE) diagnosis of small diameter melanoma. *EUROPEAN J DERMATOLOGY* 10:282-287 (2000).
- Boiveau A, Boube M, Rousseau A, Pelletier G, Guin SL: Expression of integrin $\alpha 5\beta 1$ and MMPs associated with epithelioid morphology and malignancy of uveal melanoma. *INVEST OPHTHALMOL VISUAL SCI* 41:2363-2372 (2000).
- Blaheta HJ, Ellwanger U, Schittek B, Sotlar K, Maczey E, Breuninger H, Thelen MH, Bueltmann B, Rassner G, Garbe C: Examination of regional lymph nodes by sentinel node biopsy and molecular analysis provides new staging facilities in primary cutaneous melanoma. *J INVEST DERMATOL* 114:637-642 (2000).
- Blum A, Schlagenhauff B, Stroebel W, Breuninger H, Rassner G, Garbe C: Ultrasound examination of regional lymph nodes significantly improves early detection of locoregional metastases during the follow-up of patients with cutaneous melanoma - Results of a prospective study of 1288 patients. *CANCER* 88:2534-2539 (2000).
- Brady MS, Lee F, Eckels DD, Ree SY, Latouche JB, Lee JS: Restoration of alloreactivity of melanoma by transduction with B7.1. *J IMMUNOTHER* 23:353-361 (2000).
- Busam KJ, Iversen K, Berwick M, Spagnoli GC, Old LJ, Jungbluth AA: Immunoreactivity with the anti-MAGE antibody 57B in malignant melanoma: Frequency of expression and correlation with prognostic parameters. *MODERN PATHOL* 13:459-465 (2000).
- Busam KJ, Rosai J, Iversen K, Jungbluth AA: Xanthogranulomas with inconspicuous foam cells and giant cells mimicking malignant melanoma - A clinical, histologic, and immunohistochemical study of three cases. *AMER J SURG PATHOL* 24:864-869 (2000).
- Cafiero F, Peressini A, Percivale PL, Rainero ML, Faggioni M, Gipponi M, Queirolo P, Nicolo G, Bertoglio S: Selective lymph node dissection in patients with intermediate thickness melanoma: Our experience. *ANTICANCER RES* 20:497-500 (2000).
- Cangiarella J, Symmans WF, Shapiro RL, Roses DF, Cohen JM, Chhieng D, Harris MN, Waisman J: Aspiration biopsy and the clinical management of patients with malignant melanoma and palpable regional lymph nodes. *CANCER CYTOPATHOL* 90:162-166 (2000).
- Carretero J, Obrador E, Anasagasti MJ, Martin JJ, Vidal-Vanaclocha F, Estrela JM: Growth-associated changes in glutathione content correlate with liver metastatic activity of B16 melanoma cells. *CLIN EXP METASTAS* 17:567-574 (1999).
- Cattaruzza MS: The relationship between melanoma and continuous or intermittent exposure to UV radiation. *ARCH DERMATOL* 136:773-774 (2000).
- ❖ Chakraborty AK, Sodi S, Rachkovsky M, Kolesnikova N, Platt JT, Bologna JL, Pawelek JM: A spontaneous murine melanoma lung metastasis comprised of host x tumor hybrids. *CANCER RES* 60:2512-2519 (2000).
- Chen Q, Jackson H, Cebon J, Gibbs P, Davis ID, Trapani JA: A direct comparison of cytolytic T-lymphocyte responses to Melan-A peptides in vitro: differential immunogenicity of Melan-A(27-35) and Melan-A(26-35) (vol 10, pg 21, 2000). *MELANOMA RES* 10:193-193 (2000).
- Cho D, Kim TG, Lee W, Hwang YI, Cho HI, Han H, Kwon O, Kim D, Park H, Houh D: Interleukin-18 and the costimulatory molecule B7-1 have a synergistic anti-tumor effect on murine melanoma; Implication of combined immunotherapy for poorly immunogenic malignancy. *J INVEST DERMATOL* 114:928-934 (2000).
- Cho D, Song H, Kim YM, Houh D, Hur DY, Park H, Yoon D, Pyun KH, Lee WJ, Kurimoto M, Kim YB, Kim YS, Choi I: Endogenous interleukin-18 modulates immune escape of murine melanoma cells by regulating the expression of Fas ligand and reactive oxygen intermediates. *CANCER RES* 60:2703-2709 (2000).
- Choubey D, Walter S, Geng YB, Xin H: Cytoplasmic localization of the interferon-inducible protein that is encoded by the AIM2 (absent in melanoma) gene from the 200-gene family. *FEBS LETT* 474:38-42 (2000).
- Cohen MH, Johnson JR: Temozolomide for advanced, metastatic melanoma. *J CLIN ONCOL* 18:2185-2185 (2000).
- Colella TA, Bullock TNJ, Russell LB, Mullins DW, Overwijk WW, Luckey CJ, Pierce RA, Restifo NP, Engelhard VH: Self-tolerance to the murine homologue of a tyrosinase-derived melanoma antigen: Implications for tumor immunotherapy. *J EXP MED* 191:1221-1231 (2000).
- Coupland SE, Anastassiou G, Stang A, Schilling H, Anagnostopoulos I, Bornfeld N, Stein H: The prognostic value of cyclin D1, p53, and MDM2 protein expression in uveal melanoma. *J PATHOL* 191:120-126 (2000).
- Cree IA: Cell cycle and melanoma - two different tumours from the same cell type. *J PATHOL* 191:112-114 (2000).
- Czarnecki D, Meehan CJ: Is the incidence of malignant melanoma decreasing in young Australians? *J AMER ACAD DERMATOL* 42:672-674 (2000).
- Dabrowska A, Giermasz A, Marczak M, Golab J, Jakeisiak M: Potentiated antitumor effects of interleukin 12 and matrix metalloproteinase inhibitor batimastat against B16F10 melanoma in mice. *ANTICANCER RES* 20:391-394 (2000).
- Dalgleish AG: Cancer vaccines. *BRIT J CANCER* 82:1619-1624 (2000).
- Darbon JM, Penary M, Escalas N, Casagrande F, Goubin-Gramatica F, Baudouin C, Ducommun B: Distinct Chk2 activation pathways are triggered by genistein and DNA-damaging agents in human melanoma cells. *J BIOL CHEM* 275:15363-15369 (2000).
- Darvas Z, Sakurai E, Hegyesi H, Otsu H, Watanabe T, Falus A: Turnover of histamine in human melanoma cell lines. *INFLAMM RESEARCH* 49:S70-S71 (2000).
- Dekker SK, vanDoorn R, Kempenaar J, Gruis NA, Vermeer BJ, Ponc M: Skin equivalent: an attractive model to evaluate early melanoma metastasis. *MELANOMA RES* 10:127-140 (2000).
- delOlmo M, Alonso-Varona A, Castro B, Calle Y, Bilbao P, Palomares T: Effects of L-2-oxothiazolidine-4-carboxylate on the cytotoxic activity and toxicity of cyclophosphamide in mice bearing B16F10 melanoma liver metastases. *MELANOMA RES* 10:103-112 (2000).
- deVries TJ, Fourkour A, Punt CJA, Ruiter DJ, vanMuijen GNP: Analysis of melanoma cells in peripheral blood by reverse transcription-polymerase chain reaction for tyrosinase and MART-1 after mononuclear cell collection with cell preparation

- tubes: a comparison with the whole blood guanidinium isothiocyanate RNA isolation method. *MELANOMA RES* 10:119-126 (2000).
- Drou D, Culberson C, Wyatt S, Holder WD: Human papilloma virus in melanoma biopsy specimens and its relation to melanoma progression. *ANN SURG* 231:664-670 (2000).
- Dunn CL, Zitelli JA: Standards of care for patients with malignant melanoma. *J AMER ACAD DERMATOL* 43:155-156 (2000).
- Enk AH, Nashan D, Reuben A, Knop J: High dose inhalation interleukin-2 therapy for lung metastases in patients with malignant melanoma. *CANCER* 88:2042-2046 (2000).
- Fabbri M, Ridolfi R, Maltoni R, Ridolfi L, Riccobon A, Flamini E, DePaola F, Verdecchia GM, Amadori D: Tumor infiltrating lymphocytes and continuous infusion interleukin-2 after metastasectomy in 61 patients with melanoma, colorectal and renal carcinoma. *TUMORI* 86:46-52 (2000).
- Farina B, Bartoli C, Bono A, Colombo A, Lualdi M, Tragni G, Marchesini R: Multispectral imaging approach in the diagnosis of cutaneous melanoma: potentiality and limits. *PHYS MED BIOL* 45:1243-1254 (2000).
- Gallino G, Belli F, Tragni G, Ferro F, Massone PPB, Ditto A, Leo E, Cascinelli N: Association between cutaneous melanoma and neurofibromatosis type 1: Analysis of three clinical cases and review of the literature. *TUMORI* 86:70-74 (2000).
- Gibbs P, Iannucci A, Becker M, Allen J, O'Driscoll M, McDowell K, Williams P, Rosse P, Murphy J, Gonzalez R: A phase II study of biochemotherapy for the treatment of metastatic malignant melanoma. *MELANOMA RES* 10:171-179 (2000).
- Glass F, Reintgen D, Fenske N: Standards of care for patients with malignant melanoma - Reply. *J AMER ACAD DERMATOL* 43:156-158 (2000).
- Goldberg SF, Harms JF, Quon K, Welch DR: Metastasis-suppressed C8161 melanoma cells arrest in lung but fail to proliferate. *CLIN EXP METASTAS* 17:601-607 (1999).
- Goldstein AM, Struewing JP, Chidambaram A, Fraser MC, Tucker MA: Genotype-phenotype relationships in US melanoma-prone families with CDKN2A and CDK4 mutations. *J NAT CANCER INST* 92:1006-1010 (2000).
- Gragoudas ES: Stereotactic radiosurgery of large uveal melanomas with the gamma-knife - Discussion. *OPHTHALMOLOGY* 107:1387-1388 (2000).
- Gragoudas ES, Lane AM, Regan S, Li W, Judge HE, Munzenrider JE, Seddon JM, Egan KM: A randomized controlled trial of varying radiation doses in the treatment of choroidal melanoma. *ARCH OPHTHALMOL* 118:773-778 (2000).
- Graneli P, Siardi C, Zennaro F, Cattaneo H, Malferrari G, Buffa R, Fociani P, Fregoni F, DeRuberto F, Fichera G, Peracchia A, Biunno I: Melanoma antigen genes 1 and 2 are differentially expressed in human gastric and cardiac carcinomas. *SCAND J GASTROENTEROL* 35:528-533 (2000).
- Greulich KM, Utikal J, Peter RU, Krahn G: c-MYC and nodular malignant melanoma - A case report. *CANCER* 89:97-103 (2000).
- Gude K, Shields CL, Shields JA, Eagle RC, Singh AD: Iris mammillations as the only sign of ocular melanocytosis in a child with choroidal melanoma. *ARCH OPHTHALMOL* 118:716-717 (2000).
- Hillner BE, Agarwala S, Middleton MR: Post hoc economic analysis of temozolomide versus dacarbazine in the treatment of advanced metastatic melanoma. *J CLIN ONCOL* 18:1474-1480 (2000).
- ❖ Hiratsuka J, Yoshino K, Kondoh H, Imajo Y, Mishima Y: Biodistribution of boron concentration on melanoma-bearing hamsters after administration of p-, m-, o-boronophenylalanine. *JPN J CANCER RES* 91:446-450 (2000).
- Hofmann UB, Westphal JR, Zendman AJW, Becker JC, Ruiter DJ, vanMuijen GNP: Expression and activation of matrix metalloproteinase-2 (MMP-2) and its co-localization with membrane-type 1 matrix metalloproteinase (MT1-MMP) correlate with melanoma progression. *J PATHOL* 191:245-256 (2000).
- Hofmann UB, Westphal JR, VanKraats AA, Ruiter DJ, vanMuijen GNP: Expression of integrin $\alpha(\text{nu})\beta(3)$ correlates with activation of membrane-type matrix metalloproteinase-1 (MT1-MMP) and matrix metalloproteinase-2 (MMP-2) in human melanoma cells in vitro and in vivo. *INT J CANCER* 87:12-19 (2000).
- Honavar SG, Shields JA, Shields CL: Ultrasound biomicroscopy in the diagnosis of a foreign body simulating iris melanoma. *BRIT J OPHTHALMOL* 84:546-547 (2000).
- Hoon DSB, Bostick P, Kuo C, Okamoto T, Wang HJ, Elashoff R, Morton DL: Molecular markers in blood as surrogate prognostic indicators of melanoma recurrence. *CANCER RES* 60:2253-2257 (2000).
- Horvath B, Heninger E, Hegyesi H, Le E, Radvsky Z, Szalai C, Darvas Z, Falus A: Reciprocal inhibitory interactions between interferon gamma and histamine in melanoma. *INFLAMM RESEARCH* 49:S27-S28 (2000).
- ❖ Hsu MY, Andl T, Li G, Meinkoth JL, Herlyn M: Cadherin repertoire determines partner-specific gap junctional communication during melanoma progression. *J CELL SCI* 113:1535-1542 (2000).
- Hubl U, Ishida H, Kiso M, Hasegawa A, Schauer R: Studies on the specificity and sensitivity of the influenza C virus binding assay for 9-O-acetylated sialic acids and its application to human melanomas. *J BIOCHEM TOKYO* 127:1021-1031 (2000).
- Iqbal M, Marshall E, Green JA: Ten-year survival in advanced malignant melanoma following treatment with interferon and vindesine. *ANN ONCOL* 11:483-485 (2000).
- Ito A, Katoh F, Kataoka TR, Okada M, Tsubota N, Asada H, Yoshikawa K, Maeda S, Kitamura Y, Yamasaki H, Nojima H: A role for heterologous gap junctions between melanoma and endothelial cells in metastasis. *J CLIN INVEST* 105:1189-1197 (2000).
- Ivanov VN, Ronai Z: p38 protects human melanoma cells from UV-induced apoptosis through down-regulation of NF-kappaB activity and Fas expression. *ONCOGENE* 19:3003-3012 (2000).
- Janji B, Melchior C, Vallar L, Kieffer N: Cloning of an isoform of integrin-linked kinase (ILK) that is upregulated in HT-144 melanoma cells following TGF- β stimulation. *ONCOGENE* 19:3069-3077 (2000).
- Jansen L, Nieweg OE, Peterse JL, Hoefnagel CA, Olmos RAV, Kroon BBR: Reliability of sentinel lymph node biopsy for staging melanoma. *BRIT J SURG* 87:484-489 (2000).
- Jemal A, Devesa SS, Fears TR, Hartge P: Cancer surveillance series: Changing patterns of cutaneous malignant melanoma mortality rates among whites in the United States. *J NAT CANCER INST* 92:811-818 (2000).
- Jouer E, Maeurer M, Hoon H, Karbach J, Jouer D, Zidianakis Z, Bakhshandeh-Bath A, Orth J, Neukirch C, Necker A, Reichert TE, Knuth A: Clonal expansion of Melan A-specific cytotoxic T lymphocytes in a melanoma patient responding to continued immunization with melanoma-associated peptides. *INT J CANCER* 86:538-547 (2000).

- Johnson TM, Chang A, Redman B, Rees R, Bradford C, Riba M, Lowe L: Management of melanoma with a multidisciplinary melanoma clinic model. *J AMER ACAD DERMATOL* 42:820-826 (2000).
- Kageshita T, Hamby CV, Hirai S, Kimura T, Ono T, Ferrone S: Differential clinical significance of $\alpha(v)\beta(3)$ expression in primary lesions of acral lentiginous melanoma and of other melanoma histotypes. *INT J CANCER* 89:153-159 (2000).
- Karjalainen JM, Kellokoski JK, Mannermaa AJ, Kujala HE, Moisio KI, Mitchell PJ, Eskelinen MJ, Alhava EM, Kosma VM: Failure in post-transcriptional processing is a possible inactivation mechanism of AP-2 α in cutaneous melanoma. *BRIT J CANCER* 82:2015-2021 (2000).
- Kazianis S, DellaColetta L, Morizot DC, Johnston DA, Osterndorff EA, Nairn RS: Overexpression of a fish CDKN2 gene in a hereditary melanoma model. *CARCINOGENESIS* 21:599-605 (2000).
- Keilholz U, Suci S, Eggermont AMM: What can we learn from phase II adjuvant trials in melanoma? *BRIT J CANCER* 83:6-7 (2000).
- Kircheis R, Koch Z, Wallner G, Reisler V, Schweighoffer T, Wagner E: Interleukin-2 gene-modified allogeneic melanoma cell vaccines can induce cross-protection against syngeneic tumors in mice. *CANCER GENE THERAPY* 7:870-878 (2000).
- Kirkwood JM, Mascari RA, Edington RD, Rabkin MS, Day RS, Whiteside TL, Vlock DR, Shipe-Spotloe JM: Analysis of therapeutic and immunologic effects of R-24 anti-GD3 monoclonal antibody in 37 patients with metastatic melanoma. *CANCER* 88:2693-2702 (2000).
- Kirkwood JM, Ibrahim JG, Sondak VK, Richards J, Flaherty LE, Ernstoff MS, Smith TJ, Rao U, Steele M, Blum RH: High- and low-dose interferon alfa-2b in high-risk melanoma: First analysis of Intergroup Trial E1690/S9111/C9190. *J CLIN ONCOL* 18:2444-2458 (2000).
- Kirkwood JM: Adjuvant interferon in the treatment of melanoma. *BRIT J CANCER* 82:1755-1755 (2000).
- Koch SE, Lange JR: Amelanotic melanoma: The great masquerader. *J AMER ACAD DERMATOL* 42:731-734 (2000).
- LaPorta CAM: nPKC δ a new therapeutic marker for melanoma metastasis? (Review). *INT J MOL MED* 5:467-471 (2000).
- LaPorta CAM, DiDio A, Porro D, Comolli R: Overexpression of novel protein kinase C δ in BL6 murine melanoma cells inhibits the proliferative capacity in vitro but enhances the metastatic potential in vivo. *MELANOMA RES* 10:93-102 (2000).
- Lee SW, Li H, Strong TV, Moore SE, Conry RM: Development of a polynucleotide vaccine from melanoma antigen recognized by T cells-1 and recombinant protein from melanoma antigen recognized by T cells-1 for melanoma vaccine clinical trials. *J IMMUNOTHER* 23:379-386 (2000).
- Leiter U, Schmid RM, Kaskel P, Peter RU, Krahn G: Antiapoptotic bcl-2 and bcl-xL in advanced malignant melanoma. *ARCH DERMATOL RES* 292:225-232 (2000).
- ❖ Lewis JJ, Janetzki S, Schaed S, Panageas KS, Wang SQ, Williams L, Meyers M, Butterworth L, Livingston PO, Chapman PB, Houghton AN: Evaluation of CD8(+) T-cell frequencies by the Elispot assay in healthy individuals and in patients with metastatic melanoma immunized with tyrosinase peptide. *INT J CANCER* 87:391-398 (2000).
 - ❖ Li G, Herlyn M: Dynamics of intercellular communication during melanoma development. *MOL MED TODAY* 6:163-169 (2000).
- Li WG, Stall A, Shivers SC, Lin J, Haddad F, Messina J, Glass LF, Lyman G, Reintgen DS: Clinical relevance of molecular staging for melanoma - Comparison of RT-PCR and immunohistochemistry staining in sentinel lymph nodes of patients with melanoma. *ANN SURG* 231:795-801 (2000).
- Lode HN, Xiang R, Pertl U, Fosster E, Schoenberger SP, Gillies SD, Reisfeld RA: Melanoma immunotherapy by targeted IL-2 depends on CD4(+) T-cell help mediated by CD40/CD40L interaction. *J CLIN INVEST* 105:1623-1630 (2000).
- LoMuzio L, Nocini P, Mignogna MD, Pannone G, Staibano S, Procaccini M, Rubini C, Fioroni M, Fanali S, Piattelli A: Immunocytochemical detection of hMSH2 and hMLH1 expression in oral melanoma. *ANTICANCER RES* 20:741-748 (2000).
- Lorentzen H, Weismann K, Kenet RO, Secher L, Laren FG: Comparison of dermatoscopic ABCD rule and risk stratification in the diagnosis of malignant melanoma. *ACTA DERMATO VENEREOL* 80:122-126 (2000).
- Lyng H, Haraldseth O, Rofstad EK: Measurement of cell density and necrotic fraction in human melanoma xenografts by diffusion weighted magnetic resonance imaging. *MAGN RESON MED* 43:828-836 (2000).
- Ma YQ, Geng JG: Heparan sulfate-like proteoglycans mediate adhesion of human malignant melanoma A375 cells to P-selectin under flow. *J IMMUNOL* 165:558-565 (2000).
- Mackensen A, Herbst B, Chen JL, Kohler G, Noppen C, Herr W, Spagnoli GC, Cerundolo V, Lindemann A: Phase I study in melanoma patients of a vaccine with peptide-pulsed dendritic cells generated in vitro from CD34(+) hematopoietic progenitor cells. *INT J CANCER* 86:385-392 (2000).
- Marroquin CE, White DE, Steinberg SM, Rosenberg SA, Schwartztruber DJ: Decreased tolerance to interleukin-2 with repeated courses of therapy in patients with metastatic melanoma or renal cell cancer. *J IMMUNOTHER* 23:387-392 (2000).
- McCarthy DO, Glowacki N, Schell K, Emler CA, Albertini MR: Antigenicity of human melanoma cells transfected to express the B7-1 co-stimulatory molecule (CD80) varies with the level of B7-1 expression. *CANCER IMMUNOL IMMUNOTHER* 49:85-93 (2000).
- McClay EF, McClay MET, Monroe L, Baron PL, Cole DJ, O'Brien PH, Metcalf JS, Maize JC: The effect of tamoxifen and cisplatin on the disease-free and overall survival of patients with high risk malignant melanoma. *BRIT J CANCER* 83:16-21 (2000).
- McMasters K, Murray DR, Wood WC, Greene FL, Reintgen DS: Clinical relevance of molecular staging for melanoma - Comparison of RT-PCR and immunohistochemistry staining in sentinel lymph nodes of patients with melanoma - Discussion. *ANN SURG* 231:801-803 (2000).
- Melia J, Harland C, Moss S, Eiser JR, Pendry L: Feasibility of targeted early detection for melanoma: a population-based screening study. *BRIT J CANCER* 82:1605-1609 (2000).
- Micka B, Trojanek B, Niemitz S, Lefterova P, Kruopis S, Huhn D, Wittig B, Schadendorf D, Schmidt-Wolf IGH: Comparison of non-viral transfection methods in melanoma cell primary cultures. *CYTOKINE* 12:828-833 (2000).
- Middleton: Randomized phase III study of temozolomide versus dacarbazine in the treatment of patients with advanced metastatic malignant melanoma (vol 18, pg 158, 2000). *J CLIN ONCOL* 18:2351-2352 (2000).
- Middleton MR: Adjuvant interferon in the treatment of melanoma - Reply. *BRIT J CANCER* 82:1755-1756 (2000).
- Middleton MR: Temozolomide for advanced, metastatic melanoma - Reply. *J CLIN ONCOL* 18:2185-2185 (2000).

- Miele ME, Jewett MD, Goldberg SF, Hyatt DL, Morelli C, Gualandi F, Rimessi P, Hicks DJ, Weissman BE, Barbanti-Brodano G, Welch DR: A human melanoma metastasis-suppressor locus maps to 6q16.3-q23. *INT J CANCER* 86:524-528 (2000).
- Moreau-Aubry A, LeGuiner S, Labarriere N, Gesnel MC, Jotereau F, Breathnach R: A processed pseudogene codes for a new antigen recognized by a CD8(+) T cell clone on melanoma. *J EXP MED* 191:1617-1623 (2000).
- Mueller AJ, Talies S, Schaller UC, Horstmann G, Wowra B, Kampik A: Stereotactic radiosurgery of large uveal melanomas with the gamma-knife. *OPHTHALMOLOGY* 107:1381-1387 (2000).
- Naldi L, Gallus S, Imberti GL, Cainelli T, Negri E, LaVecchia C: Sunscreens and cutaneous malignant melanoma: An Italian case-control study. *INT J CANCER* 86:879-882 (2000).
- Nasca R, Carbone E: Natural killer cells as potential tools in melanoma metastatic spread control. *ONCOL RES* 11:339-343 (1999).
- Naus NC, Zuidervaart W, Rayman N, Slater R, vanDrunen E, Ksander B, Luyten GPM, Klein A: Mutation analysis of the PTEN gene in uveal melanoma cell lines. *INT J CANCER* 87:151-153 (2000).
- Noppen C, Loy F, Burri L, Zajac P, Rimmel E, Schaefer C, Licher U, Heberer M, Spagnoli GC: Naturally processed and concealed HLA-A2.1-restricted epitopes from tumor-associated antigen tyrosinase-related protein-2. *INT J CANCER* 87:241-246 (2000).
- O'Leary JP, Reintgen DS, Iglehart JD, Coepland EM, Holder WD: Human papilloma virus in melanoma biopsy specimens and its relation to melanoma progression - Discussion. *ANN SURG* 231:670-671 (2000).
- Oliva E, Quinn TR, Amin MB, Eble JN, Epstein JI, Srigley JR, Young RH: Primary malignant melanoma of the urethra - A clinicopathologic analysis of 15 cases. *AMER J SURG PATHOL* 24:785-796 (2000).
- Palmieri G, Ascierio PA, Satriano SMR, Strazzullo M, Apice G, Castello G: Circulating melanoma-associated markers detected by RT-PCR in patients with classic Kaposi's sarcoma. *ANN ONCOL* 11:635-636 (2000).
- Panelli MC, Bettinotti MP, Lally K, Ohnmacht GA, Li Y, Robbins P, Riker A, Rosenberg SA, Marincola FM: A tumor-infiltrating lymphocyte from a melanoma metastasis with decreased expression of melanoma differentiation antigens recognizes MAGE-12. *J IMMUNOL* 164:4382-4392 (2000).
- Panov V, Salomon Y, Kabalka GW, Bendel P: Uptake and washout of borocaptate sodium and borono-phenylalanine in cultured melanoma cells: A multi-nuclear NMR study. *RADIAT RES* 154:104-112 (2000).
- Piepkorn M: Melanoma genetics: An update with focus on the CDKN2A(p16)/ARF tumor suppressors. *J AMER ACAD DERMATOL* 42:705-722 (2000).
- Plesnicar A, Kovac V: Breast metastases from cutaneous melanoma - A report of three cases. *TUMORI* 86:170-173 (2000).
- Propper DJ, Braybrooke JP, Levitt NC, O'Byrne KO, Christodoulos K, Han C, Talbot DC, Ganesan TS, Harris AL: Phase II study of second-line therapy with DTIC, BCNU, cisplatin and tamoxifen (Dartmouth regimen) chemotherapy in patients with malignant melanoma previously treated with dacarbazine. *BRIT J CANCER* 82:1759-1763 (2000).
- Raisova M, Bektas M, Wieder T, Daniel P, Eberle J, Orfanos CE, Geilen CC: Resistance to CD95/Fas-induced and ceramide-mediated apoptosis of human melanoma cells is caused by a defective mitochondrial cytochrome c release. *FEBS LETT* 473:27-32 (2000).
- Rasi G, Terzoli E, Izzo F, Pierimarchi P, Ranuzzi M, Sinibaldi-Vallebona P, Tuthill C, Garaci E: Combined treatment with thymosin- α 1 and low dose interferon- α after dacarbazine in advanced melanoma. *MELANOMA RES* 10:189-192 (2000).
- Reeves ME, Coit DG: Melanoma - A multidisciplinary approach for the general surgeon. *SURG CLIN N AMER* 80:581-+ (2000).
- Reifenberger J, Wolter M, Bostrou J, Bouchges R, Schulte KW, Megahed M, Ruzicka T, Reifenberger G: Allelic losses on chromosome arm 10q and mutation of the PTEN (MMAC1) tumour suppressor gene in primary and metastatic malignant melanomas. *VIRCHOWS ARCHIV* 436:487-493 (2000).
- Retsas S, Mohith A, Bell J, Horwood N, Alexander H: Melanoma and additional primary cancers. *MELANOMA RES* 10:145-152 (2000).
- Richard MA, Grob JJ, Avril MF, Delaunay M, Gouvernet J, Wolkenstein P, Souteyrand P, Dreno B, Bonerandi JJ, Dalac S, Machet L, Guillaume JC, Chevrant-Breton J, Vilmer C, Aubin F, Guillot B, Beylot-Barry M, Lok C, Raison-Peyron N, Chemaly P: Delays in diagnosis and melanoma prognosis (I): The role of patients. *INT J CANCER* 89:271-279 (2000).
- Richard MA, Grob JJ, Avril MF, Delaunay M, Gouvernet J, Wolkenstein P, Souteyrand P, Dreno B, Bonerandi JJ, Dalac S, Machet L, Guillaume JC, Chevrant-Breton J, Vilmer C, Aubin F, Guillot B, Beylot-Barry M, Lok C, Raison-Peyron N, Chemaly P: Delays in diagnosis and melanoma prognosis (II): The role of doctors. *INT J CANCER* 89:280-285 (2000).
- ❖ Rieber M, Rieber MS: Apoptosis-inducing levels of uv radiation and proteasome inhibitors produce opposite effects on p21(WAF1) in human melanoma cells. *INT J CANCER* 86:462-467 (2000).
- Riker AI, Kammula US, Panelli MC, Wang E, Ohnmacht GA, Steinberg SM, Rosenberg SA, Marincola FM: Threshold levels of gene expression of the melanoma antigen gp100 correlate with tumor cell recognition by cytotoxic T lymphocytes. *INT J CANCER* 86:818-826 (2000).
- Robinson ES, Hill RH, Kripke ML, Setlow RB: The *Monodelphis* melanoma model: Initial report on large ultraviolet A exposures of suckling young. *PHOTOCHEM PHOTOBIOLOG* 71:743-746 (2000).
- Rodrigues LKE, Leong SPL, Ljung BM, Sagebiel RW, Burnside N, Hu TLW, Ng BW, Miller JR, Kashani-Sabet M: Fine needle aspiration in the diagnosis of metastatic melanoma. *J AMER ACAD DERMATOL* 42:735-740 (2000).
- Rossi CR, Scagnet B, Vecchiato A, Mocellin S, Pilati P, Foletto M, Zavagno G, Casara D, Montesco MC, Tregnaghi A, Rubaltelli L, Lise M: Sentinel node biopsy and ultrasound scanning in cutaneous melanoma: clinical and technical considerations. *EUR J CANCER* 36:895-900 (2000).
- Rossi CR, Vecchiato A, Bezze G, Mastrangelo G, Montesco MC, Mocellin S, Meneghetti G, Mazzoleni F, Peserico A, Nitti D, Lise M: Early detection of melanoma: an educational campaign in Padova, Italy. *MELANOMA RES* 10:181-187 (2000).
- Sauroja I, Smeds J, Vlaykova T, Kumar R, Talve L, Hahka-Kemppinen M, Punnonen K, Jans CT, Hemminki K, Pyrh? en S: Analysis of G(1)/S checkpoint regulators in metastatic melanoma. *GENE CHROMOSOME CANCER* 28:404-414 (2000).
- Schadendorf D: Ex vivo cytokine gene transfer in melanomas by using particle bombardment. *GENE THERAPY OF CANCER: METHODS AND PROTOCOLS*. 439-451 (2000).
- Schlagenhauff B, Ellwanger U, Breuninger H, Stroebel W, Rassner C, Garbe C: Prognostic impact of the type of anaesthesia used during the excision of primary cutaneous melanoma. *MELANOMA RES* 10:165-169 (2000).

- Schrader AJ: Combined chemoimmunotherapy in metastatic melanoma - is there a need for the double? *ANTI CANCER DRUG* 11:143-148 (2000).
- Selzer E, Pimentel E, Wacheck W, Schlegel W, Pehamberger H, Jansen B, Kodym R: Effects of betulinic acid alone and in combination with irradiation in human melanoma cells. *J INVEST DERMATOL* 114:935-940 (2000).
- Severi G, Giles GG, Robertson C, Boyle P, Autier P: Mortality from cutaneous melanoma: evidence for contrasting trends between populations. *BRIT J CANCER* 82:1887-1891 (2000).
- Shennan MG, Badin AC, Walsh S, Summers A, From L, McKenzie M, Goldstein AM, Tucker MA, Hogg D, Lassam N: Lack of germline CDK6 mutations in familial melanoma. *ONCOGENE* 19:1849-1852 (2000).
- Shields JA, Shields CL, Pulido J, Eagle RC, Nothnagel AF: Iris varix simulating an iris melanoma. *ARCH OPHTHALMOL* 118:707-710 (2000).
- Shimizu K, Nagamachi Y, Tani M, Kimura K, Shiroishi T, Wakana S, Yokota J: Molecular cloning of a novel NF2/ERM/4.1 superfamily gene, Ehm2, that is expressed in high-metastatic K1735 murine melanoma cells. *GENOMICS* 65:113-120 (2000).
- Smeds J, Kumar R, Rozell BL, Hemminki K: Increased frequency of LOH on chromosome 9 in sporadic primary melanomas is associated with increased patient age at diagnosis. *MUTAGENESIS* 15:257-260 (2000).
- Spitzer JH, Nunez NP, Meadows SA, Gallucci RM, Blank SE, Meadows GG: The modulation of B16BL6 melanoma metastasis is not directly mediated by cytolytic activity of natural killer cells in alcohol-consuming mice. *ALCOHOL CLIN EXP RES* 24:837-844 (2000).
- Stadelmann WK, McMasters K, Digenis AG, Reintgen DS: Cutaneous melanoma of the head and neck: Advances in evaluation and treatment. *PLAST RECONSTR SURG* 105:2105-2126 (2000).
- Staibano: Morphometric analysis of AgNORs in uveal malignant melanoma - Reply. *ANAL QUANT CYTOL HISTOL* 22:184-184 (2000).
- Stannard CE, Sealy GRH, Hering ER, Pereira SB, Knowles R, Hill JC: Malignant melanoma of the eyelid and palpebral conjunctiva treated with iodine-125 brachytherapy. *OPHTHALMOLOGY* 107:951-958 (2000).
- Stoll R, Renner C, Ambrosius D, Golob M, Voelter W, Buettner R, Bosserhoff AK, Holak TA: Sequence-specific H-1, C-13, and N-15 assignment of the human melanoma inhibitory activity (MIA) protein. *J BIOMOL NMR* 17:87-88 (2000).
- Straten PT, Guldberg P, Moerch U, Becker JC: Anti-melanocyte T cell responses - Methodology versus biology. *J INVEST DERMATOL* 114:738-739 (2000).
- Su YA, Bittner ML, Chen YD, Tao L, Jiang Y, Zhang YH, Stephan DA, Trent JM: Identification of tumor-suppressor genes using human melanoma cell lines UACC903, UACC903(+6), and SRS3 by comparison of expression profiles. *MOL CARCINOGEN* 28:119-127 (2000).
- Sun YS, Song MX, Stevanovic S, Jankowiak C, Paschen A, Rammensee HG, Schadendorf D: Identification of a new HLA-A*0201-restricted T-cell epitope from the tyrosinase-related protein 2 (TRP2) melanoma antigen. *INT J CANCER* 87:399-404 (2000).
- Tannous ZS, Lerner LH, Duncan LM, Mihm MC, Flotte TJ: Progression to invasive melanoma from malignant melanoma in situ, lentigo maligna type. *HUM PATHOL* 31:705-708 (2000).
- Thomas JM, Patocskai EJ: The argument against sentinel node biopsy for malignant melanoma. *BRIT MED J* 321:3-4 (2000).
- Toschi E, Rota R, Antonini A, Melillo G, Capogrossi MC: Wild-type p53 gene transfer inhibits invasion and reduces matrix metalloproteinase-2 levels in p53-mutated human melanoma cells. *J INVEST DERMATOL* 114:1188-1194 (2000).
- Tosi P, Miracco C, Santopietro R, Pacenti L, Perotti R, Materno M, Luzi P: Possible diagnostic role of telomerase activity evaluation in the differential diagnosis between Spitz naevi and cutaneous malignant melanoma. *BRIT J DERMATOL* 142:1060-1061 (2000).
- Trefzer U, Weingart G, Sterry W, Walden P: Hybrid cell vaccination in patients with metastatic melanoma. *GENE THERAPY OF CANCER: METHODS AND PROTOCOLS*. 469-475 (2000).
- Tsao H, Zhang X, Fowlkes K, Haluska FG: Relative reciprocity of NRAS and PTEN/MMAC1 alterations in cutaneous melanoma cell lines. *CANCER RES* 60:1800-1804 (2000).
- Tsukamoto K, Hirata S, Osada A, Kitamura R, Shimada S: Detection of circulating melanoma cells by RT-PCR amplification of three different melanocyte-specific mRNAs in a mouse model. *PIGM CELL RES* 13:185-189 (2000).
- Tsurifune T, Ito T, Li XJ, Yamashiro S, Okada M, Kanematsu T, Shiku H, Furukawa K: Alteration of tumor phenotypes of B16 melanoma after genetic remodeling of the ganglioside profile. *INT J ONCOL* 17:159-165 (2000).
- Tuccari G, Gimenez-Mas JA, Fedele F, Del Agua C, Melcon B, Trombetta CJ, Giuffr parameter in choroidal melanomas: a standardised analysis. *ANAL CELL PATHOL* 19:163-168 (1999).
- Tuccari G, Giuffres G, Gimenez-Mas JA, Offner D: Morphometric analysis of AgNORs in uveal malignant melanoma. *ANAL QUANT CYTOL HISTOL* 22:183-184 (2000).
- Valmori D, Dutoit V, Lienard D, Lejeune F, Speiser D, Rimoldi D, Cerundolo V, Dietrich PY, Cerottini JC, Romero P: Tetramer-guided analysis of TCR β -chain usage reveals a large repertoire of melan-A-specific CD8(+) T cells in melanoma patients. *J IMMUNOL* 165:533-538 (2000).
- Vetter CS, Straten PT, Terheyden P, Zeuthen J, Brocker EB, Becker JC: Expression of CD94/NKG2 subtypes on tumor-infiltrating lymphocytes in primary and metastatic melanoma. *J INVEST DERMATOL* 114:941-947 (2000).
- Villa R, Folini M, Perego P, Supino R, Setti E, Daidone MG, Zunino F, Zaffaroni N: Telomerase activity and telomere length in human ovarian cancer and melanoma cell lines: Correlation with sensitivity to DNA damaging agents. *INT J ONCOL* 16:995-1002 (2000).
- Villa R, Folini M, Lualdi S, Veronese S, Daidone MG, Zaffaroni N: Inhibition of telomerase activity by a cell-penetrating peptide nucleic acid construct in human melanoma cells. *FEBS LETT* 473:241-248 (2000).
- Vlodavsky E, Ben Izhak O, Best LA, Kerner H: Primary malignant melanoma of the anterior mediastinum in a child. *AMER J SURG PATHOL* 24:747-749 (2000).
- Voit C, Mayer T, Proebstle TM, Weber L, Kron M, Krupienski M, Zeelen U, Sterry W, Schoengen A: Ultrasound-guided fine-needle aspiration cytology in the early detection of melanoma metastases. *CANCER CYTOPATHOL* 90:186-193 (2000).

- Wagner JD, Corbett L, Park HM, Davidson D, Coleman JJ, Havlik RJ, Hayes JT: Sentinel lymph node biopsy for melanoma: Experience with 234 consecutive procedures. *PLAST RECONSTR SURG* 105:1956-1966 (2000).
- Walsh P, Gouzalez R, Dow S, Elmslie R, Potter T, Glode LM: A phase I study using direct combination DNA injections for the immunotherapy of metastatic melanoma. *HUM GENE THER* 11:1355-1368 (2000).
- Wellbrock C, Schartl M: Activation of phosphatidylinositol 3-kinase by a complex of p59(fyn) and the receptor tyrosine kinase Xmrk is involved in malignant transformation of pigment cells. *EUR J BIOCHEM* 267:3513-3522 (2000).
- Westerdahl J, Ingvar C, Mubock A, Jonsson N, Olsson H: Risk of cutaneous malignant melanoma in relation to use of sunbeds: further evidence for UV-A carcinogenicity. *BRIT J CANCER* 82:1593-1599 (2000).
- Westerdahl J, Ingvar C, Mubock A, Olsson H: Sunscreen use and malignant melanoma. *INT J CANCER* 87:145-150 (2000).
- Westphal JR, Van'tHullenaar R, Peek R, Willems RW, Crickard K, Crickard U, Askaa J, Clemmensen I, Ruiter DJ, DeWaal RMW: Angiogenic balance in human melanoma: Expression of VEGF, bFGF, IL-8, PDGF and angiostatin in relation to vascular density of xenografts in vivo. *INT J CANCER* 86:768-776 (2000).
- Wimer BM, Mann PL: Apparent pokeweed mitogen cure of metastatic gum melanoma in an older dog. *CANCER BIOTHER RADIOPHARM* 15:201-205 (2000).
- Wolchok JD, Klimek VM, Williams L, Chapman PB: Prophylactic recombinant epoetin alfa markedly reduces the need for blood transfusion in patients with metastatic melanoma treated with biochemotherapy. *CYTOKINES CELL MOL THER* 5:205-206 (1999).
- ❖ Wrone DA, Tanabe KK, Cosimi AB, Gadd MA, Souba WW, Sober AJ: Lymphedema after sentinel lymph node biopsy for cutaneous melanoma - A report of 5 cases. *ARCH DERMATOL* 136:511-514 (2000).
 - Wronski M, Arbit E: Surgical treatment of brain metastases from melanoma: a retrospective study of 91 patients. *J NEUROSURG* 93:9-18 (2000).
 - Xiang R, Lode HN, Chao TH, Ruehlmann JM, Dolman CS, Rodriguez F, Whitton JL, Overwijk WW, Restifo NP, Reisfeld RA: An autologous oral DNA vaccine protects against murine melanoma. *PROC NAT ACAD SCI USA* 97:5492-5497 (2000).
 - Xu GG, Snellman E, Bykov VJ, Jansen CT, Hemminki K: Cutaneous melanoma patients have normal repair kinetics of ultraviolet-induced DNA repair in skin in situ. *J INVEST DERMATOL* 114:628-631 (2000).
 - Zabel RJ, Vinson RP, McCollough ML: Malignant melanoma arising in a seborrheic keratosis. *J AMER ACAD DERMATOL* 42:831-833 (2000).
 - Zehetmayer M, Kitz K, Menapace R, Ertl A, Heinzl H, Ruhswurm I, Georgopoulos M, Dieckmann K, Peter R: Local tumor control and morbidity after one to three fractions of stereotactic external beam irradiation for uveal melanoma. *RADIOTHER ONCOL* 55:135-144 (2000).
 - Zhang YM, Iwabuchi K, Nunomura S, Hakomori S: Effect of synthetic sialyl 2->1 sphingosine and other glycosylsphingosines on the structure and function of the "glycosphingolipid signaling domain (GSD)" in mouse melanoma B16 cells. *BIOCHEMISTRY USA* 39:2459-2468 (2000).

MSH, POMC, GROWTH FACTORS & RECEPTORS

- Abbott CR, Rossi M, Kim MS, AlAhmed SH, Taylor GM, Ghatei MA, Smith DM, Bloom SR: Investigation of the melanocyte stimulating hormones on food intake - Lack of evidence to support a role for the melanocortin-3-receptor. *BRAIN RES* 869:203-210 (2000).
- ❖ Abdel-Malek Z: Regulation of the mouse and human melanocortin-1 receptor. *MELANOCORTIN RECEPTORS*. 521-536 (2000).
 - Adan RAH: Effects of melanocortins in the nervous system. *MELANOCORTIN RECEPTORS*. 109-141 (2000).
 - Amemiya Y, Takahashi A, Suzuki N, Sasayama Y, Kawauchi H: Molecular cloning of proopiomelanocortin cDNA from an elasmobranch, the stingray, *Dasyatis akajei*. *GEN COMP ENDOCRINOL* 118:105-112 (2000).
 - Arbiser JL, Byers HR, Cohen C: Altered basic fibroblast growth factor expression in common epidermal neoplasms: Examination with in situ hybridization and immunohistochemistry. *J AMER ACAD DERMATOL* 42:973-977 (2000).
 - Benoit S, Schwartz M, Baskin D, Woods SC, Seeley RJ: CNS melanocortin system involvement in the regulation of food intake. *HORMONE BEHAV* 37:299-305 (2000).
 - Benoit SC, Schwartz MW, Lachey JL, Hagan MM, Rushing PA, Blake KA, Yagaloff KA, Kurylko G, Franco L, Danhoo W, Seeley RJ: A novel selective melanocortin-4 receptor agonist reduces food intake in rats and mice without producing aversive consequences. *J NEUROSCI* 20:3442-3448 (2000).
 - Beieot M, Saez JM: Melanocortins and adrenocortical function. *MELANOCORTIN RECEPTORS*. 75-107 (2000).
 - Bhardwaj R, Hadley ME, Dorr RT, Dvorakova K, Brooks C, Blanchard J: Pharmacologic response of a controlled-release PLGA formulation for the alpha-melanocyte stimulating hormone analog, melanotan-I. *PHARMACEUT RES* 17:593-599 (2000).
 - Boston BA: Peripheral effects of melanocortins. *MELANOCORTIN RECEPTORS*. 143-169 (2000).
 - ❖ Bowne WB, Wolchok JD, Hawkins WG, Srinivasan R, Gregor P, Blachere NE, Moroi Y, Engelhorn ME, Houghton AN, Lewis JJ: Injection of DNA encoding granulocyte-macrophage colony-stimulating factor recruits dendritic cells for immune adjuvant effects. *CYTOKINES CELL MOL THER* 5:217-225 (1999).
 - Carbonell GV, DellaColleta HHM, Yano T, Darini ALC, Levy CE, Fonseca BAL: Clinical relevance and virulence factors of pigmented *Serratia marcescens*. *FEMS IMMUNOL MED MICROBIOL* 28:143-149 (2000).
 - Cevenini G, Borzelli G, Rubegni P, Massai MR, Andreassi L, Barbini P: Modified Karhunen-Loeve expansion for evaluating skin-colour-associated melanoma risk factors. *COMPUT BIOL MED* 30:171-189 (2000).
 - Chang AE, Li Q, Bishop DK, Normolle DP, Redman BD, Nickoloff BJ: Immunogenetic therapy of human melanoma utilizing autologous tumor cells transduced to secrete granulocyte-macrophage colony-stimulating factor. *HUM GENE THER* 11:839-850 (2000).
 - Chen WB: The melanocortin-5 receptor. *MELANOCORTIN RECEPTORS*. 449-472 (2000).
 - ❖ Cone RD: The melanocortin-4 receptor. *MELANOCORTIN RECEPTORS*. 405-447 (2000).

- Cremer MC, DeBarioglio SR, Celis ME: Interaction between α -MSH and acetylcholinergic system upon striatal cAMP and IP3 levels. *PEPTIDES* 21:699-704 (2000).
- Cutul M, Cristiani S, Lipton JM, Catania A: Antimicrobial effects of α -MSH peptides. *J LEUKOCYTE BIOL* 67:233-239 (2000).
- Danielsen T, Rofstad EK: The constitutive level of vascular endothelial growth factor (VEGF) is more important than hypoxia-induced VEGF up-regulation in the angiogenesis of human melanoma xenografts. *BRIT J CANCER* 82:1528-1534 (2000).
- ❖ Desai SH, Boskovic G, Eastham L, Dawson M, Niles RM: Effect of receptor-selective retinoids on growth and differentiation pathways in mouse melanoma cells. *BIOCHEM PHARMACOL* 59:1265-1275 (2000).
- Dunbar JC, Lu HQ: Proopiomelanocortin (POMC) products in the central regulation of sympathetic and cardiovascular dynamics: studies on melanocortin and opioid interactions. *PEPTIDES* 21:211-217 (2000).
- Eberle AN: Proopiomelanocortin and the melanocortin peptides. *MELANOCORTIN RECEPTORS*. 3-67 (2000).
- Eberle AN, Froidevaux S, Siegrist W: Melanocortins and melanoma. *MELANOCORTIN RECEPTORS*. 491-520 (2000).
- Everts RE, Rothuizen J, vanOost BA: Identification of a premature stop codon in the melanocyte-stimulating hormone receptor gene (MC1R) in Labrador and Golden retrievers with yellow coat colour. *ANIM GENET* 31:194-199 (2000).
- Gembitsky DS, DeAngelis PM, Reichelt KL, Elgjo K: An endogenous melanocyte-inhibiting tripeptide pyroGlu-Phe-GlyNH(2) delays in vivo growth of monoclonal experimental melanoma. *CELL PROLIFERATION* 33:91-99 (2000).
- Haskell-Luevano C, Monck EK, Wan YP, Schentrup AM: The agouti-related protein decapeptide (Yc[CRFFNAFC]Y) possesses agonist activity at the murine melanocortin-1 receptor. *PEPTIDES* 21:683-689 (2000).
- Haskell-Luevano C: In vitro mutagenesis studies of melanocortin receptor coupling and ligand binding. *MELANOCORTIN RECEPTORS*. 263-306 (2000).
- Haycock JW, Rowe SJ, Cartledge S, Wyatt A, Ghanem G, Morandini R, Rennie IG, MacNeil S: α -melanocyte-stimulating hormone reduces impact of proinflammatory cytokine and peroxide-generated oxidative stress on keratinocyte and melanoma cell lines. *J BIOL CHEM* 275:15629-15636 (2000).
- Healy E, Birch-Machin M, Rees JL: The human melanocortin-1 receptor. *MELANOCORTIN RECEPTORS*. 341-359 (2000).
- Healy E, Flannagan N, Ray A, Todd C, Jackson IJ, Matthews JNS, Birch-Machin MA, Rees JL: Melanocortin-1-receptor gene and sun sensitivity in individuals without red hair. *LANCET* 355:1072-1073 (2000).
- Hruby VJ, Han GX: The molecular pharmacology of alpha-melanocyte stimulating hormone - Structure-activity relationships for melanotropins at melanocortin receptors. *MELANOCORTIN RECEPTORS*. 239-261 (2000).
- ❖ Hsu MY, Meier FE, Nesbit M, Hsu JY, VanBelle P, Elder DE, Herlyn M: E-cadherin expression in melanoma cells restores keratinocyte-mediated growth control and down-regulates expression of invasion-related adhesion receptors. *AMER J PATHOL* 156:1515-1525 (2000).
- Hurks HMH, Metzelaar-Blok JAW, Barthen ER, Zwinderman AH, DeWolff-Rouendaal D, Keunen JEE, Jager MJ: Expression of epidermal growth factor receptor: Risk factor in uveal melanoma. *INVEST OPHTHALMOL VISUAL SCI* 41:2023-2027 (2000).
- Jean D, Tellez C, Huang SY, Davis DW, Bruns CJ, McConkey DJ, Hinrichs SH, Bar-Eli M: Inhibition of tumor growth and metastasis of human melanoma by intracellular anti-ATF-1 single chain Fv fragment. *ONCOGENE* 19:2721-2730 (2000).
- Kawakami S, Bungo T, Ando R, Ohgushi A, Shimajo M, Masuda Y, Furuse M: Central administration of α -melanocyte stimulating hormone inhibits fasting- and neuropeptide Y-induced feeding in neonatal chicks. *EUR J PHARMACOL* 398:361-364 (2000).
- Lawson D, Kirkwood JM: Granulocyte-macrophage colony-stimulating factor: Another cytokine with adjuvant therapeutic benefit in melanoma? *J CLIN ONCOL* 18:1603-1605 (2000).
- ❖ Lerner AB: Melanocortins and pigmentation. *MELANOCORTIN RECEPTORS*. 69-73 (2000).
- Lu DS, Haskell-Luevano C, Vage DI, Cone RD: The melanocortin-1 receptor. *MELANOCORTIN RECEPTORS*. 309-339 (2000).
- Macdonald D, Murgolo N, Zhang RM, Durkin JP, Yao XR, Strader CD, Graziano MP: Molecular characterization of the melanin-concentrating hormone/receptor complex: Identification of critical residues involved in binding and activation. *MOL PHARMACOL* 58:217-225 (2000).
- Massi D, Borgognoni L, Franchi A, Martini L, Reali UM, Santucci M: Thick cutaneous malignant melanoma: a reappraisal of prognostic factors. *MELANOMA RES* 10:153-164 (2000).
- Molne EL, Hegyesi H, Tieh S, Darvas Z, Lozle V, Szalai C, Falus A: Biosynthesis of interleukin-6, an autocrine growth factor for melanoma, is regulated by melanoma-derived histamine. *SEMIN CANCER BIOL* 10:25-28 (2000).
- Mountjoy KG: Cloning of the melanocortin receptors. *MELANOCORTIN RECEPTORS*. 209-235 (2000).
- Murray JF, Adan RAH, Walker R, Baker BI, Thody AJ, Nijenhuis WAJ, Yukitake J, Wilson CA: Melanin-concentrating hormone, melanocortin receptors and regulation of luteinizing hormone release. *J NEUROENDOCRINOL* 12:217-223 (2000).
- Pirozzi G, Lombardi V, Zanzi D, Ionna F, Lombardi ML, Errico S, Ruggiero G, Manzo C: CD40 expressed on human melanoma cells mediates T cell co-stimulation and tumor cell growth. *INT IMMUNOL* 12:787-795 (2000).
- Redondo P, Bandres E, Solano T, Okroujnov I, Garcia-Foncillas J: Vascular endothelial growth factor (VEGF) and melanoma. N-acetylcysteine downregulates VEGF production in vitro. *CYTOKINE* 12:374-378 (2000).
- Rees JL: The melanocortin 1 receptor (MC1R): More than just red hair. *PIGMENT CELL RES* 13:135-140 (2000).
- Ryan CW, Shulman KL, Richards JM, Kugler JW, Sosman JA, Ansari RH, Vokes EE, Vogelzang NJ: CI-980 in advanced melanoma and hormone refractory prostate cancer. *INVEST NEW DRUG* 18:187-191 (2000).
- ❖ Shellman YG, Chapman JT, Fujita M, Norris DA, Maxwell IH: Expression of activated N-ras in a primary melanoma cell line counteracts growth inhibition by transforming growth factor- β . *J INVEST DERMATOL* 114:1200-1204 (2000).
- Sone M, Takahashi K, Murakami O, Totsune K, Arihara Z, Satoh F, Sasano H, Ito H, Mouri T: Binding sites for melanin-concentrating hormone in the human brain. *PEPTIDES* 21:245-250 (2000).
- Spitler LE, Grossbard ML, Ernstoff MS, Silver G, Jacobs M, Hayes FA, Soong SJ: Adjuvant therapy of stage III and IV malignant melanoma using granulocyte-macrophage colony-stimulating factor. *J CLIN ONCOL* 18:1614-1621 (2000).
- Szardenings M, Muceniece R, Mutule I, Mutulis F, Wikberg JES: New highly specific agonistic peptides for human melanocortin MC1 receptor. *PEPTIDES* 21:239-243 (2000).

- Takeuchi S, Teshigawara K, Takahashi S: Widespread expression of Agouti-related protein (AGRP) in the chicken: a possible involvement of AGRP in regulating peripheral melanocortin systems in the chicken. *BBA MOL CELL RES* 1496:261-269 (2000).
- Tatro JB: Melanocortin receptor expression and function in the nervous system. *MELANOCORTIN RECEPTORS*. 173-207 (2000).
- Vergoni AV, Schioth HB, Bertolini A: Melanocortins and feeding behavior. *BIOMED PHARMACOTHERAPY* 54:129-134 (2000).
- ❖ Xu WD, Angelis K, Danielpour D, Haddad MM, Bischof O, Campisi J, Stavnezer E, Medrano EE: Ski acts as a co-repressor with Smad2 and Smad3 to regulate the response to type β transforming growth factor. *PROC NAT ACAD SCI USA* 97:5924-5929 (2000).
- Yahata T, deCaestecker MP, Lechleider RJ, Andriole S, Roberts AB, Isselbacher KJ, Shioda T: The MSG1 non-DNA-binding transactivator binds to the p300/CBP coactivators, enhancing their functional link to the Smad transcription factors. *J BIOL CHEM* 275:8825-8834 (2000).
- Zemel MB, Shi H: Pro-opiomelanocortin (POMC) deficiency and peripheral melanocortins in obesity. *NUTR REV* 58:177-180 (2000).
- Zhang XD, Franco AV, Nguyen T, Gray CP, Hersey P: Differential localization and regulation of death and decoy receptors for TNF-related apoptosis-inducing ligand (TRAIL) in human melanoma cells. *J IMMUNOL* 164:3961-3970 (2000).

DEVELOPMENTAL BIOLOGY

- Epstein JA, Li J, Lang D, Chen F, Brown CB, Jin FZ, Li MM, Thomas M, Liu ECJ, Wessels A, Lo CW: Migration of cardiac neural crest cells in Splotch embryos. *DEVELOPMENT* 127:1869-1878 (2000).
- Huizing M, Anikster Y, Gahl WA: Characterization of a partial pseudogene homologous to the Hermansky-Pudlak syndrome gene HPS-1; relevance for mutation detection. *HUM GENET* 106:370-373 (2000).
- Jordan SF, Jackson IJ: A late wave of melanoblast differentiation and rostrocaudal migration revealed in patch and rump-white embryos. *MECH DEVELOP* 92:135-143 (2000).
- Kenny SE, Hofstra RMW, Buys CHCM, Vaillant CR, Lloyd DA, Edgar DH: Reduced endothelin-3 expression in sporadic Hirschsprung disease. *BRIT J SURG* 87:580-585 (2000).
- Kunieda T, Ide H, Nakagiri M, Yoneda K, Konfortov B, Ogawa H: Localization of the locus responsible for Chediak-Higashi syndrome in cattle to bovine chromosome 28. *ANIM GENET* 31:87-90 (2000).
- Lourensens S, Motro B, Bernstein A, Diamond J: Defects in sensory nerve numbers and growth in mutant Kit and Steel mice. *NEUROREPORT* 11:1159-1165 (2000).
- Margue CM, Bernasconi M, Barr FG, Schuler BW: Transcriptional modulation of the anti-apoptotic protein BCL-XL by the paired box transcription factors PAX3 and PAX3/FKHR. *ONCOGENE* 19:2921-2929 (2000).
- Miller DJ, Hayward DC, Reece-Hoyes JS, Scholten I, Catmull J, Gehring WJ, Callaerts P, Larsen JE, Ball EE: Pax gene diversity in the basal cnidarian *Acropora millepora* (Cnidaria, Anthozoa): Implications for the evolution of the Pax gene family. *PROC NAT ACAD SCI USA* 97:4475-4480 (2000).
- Ohta H, Yomogida K, Dohmae K, Nishimune Y: Regulation of proliferation and differentiation in spermatogonial stem cells: the role of c-kit and its ligand SCF. *DEVELOPMENT* 127:2125-2131 (2000).
- Peirano RI, Goerich DE, Riethmacher D, Wegner M: Protein zero gene expression is regulated by the glial transcription factor Sox10. *MOL CELL BIOL* 20:3198-3209 (2000).
- Stenkamp DL, Frey RA, Prabhudesai SN, Raymond PA: Function for hedgehog genes in zebrafish retinal development. *DEVELOP BIOL* 220:238-252 (2000).

DIFFERENTIATION

- Alexeev V, Yoon K: Gene correction by RNA-DNA oligonucleotides. *PIGM CELL RES* 13:72-79 (2000).
- Aubin F, Chtourou M, Teyssier JR, Laubriet A, Mougin CH, Blanc D, Humbert P: The detection of tyrosinase mRNA in the peripheral blood of stage I melanoma patients is not of clinical relevance in predicting metastasis risk and survival. *MELANOMA RES* 10:113-118 (2000).
- ❖ Barsh GS, Farooqi IS, O'Rahilly S: Genetics of body-weight regulation. *NATURE* 404:644-651 (2000).
- Battaini G, Monzani E, Casella L, Santagostini L, Pagliarini R: Inhibition of the catecholase activity of biomimetic dinuclear copper complexes by kojic acid. *J BIOL INORG CHEM* 5:262-268 (2000).
- Berson JF, Frank DW, Calvo PA, Bieler BM, Marks MS: A common temperature-sensitive allelic form of human tyrosinase is retained in the endoplasmic reticulum at the nonpermissive temperature. *J BIOL CHEM* 275:12281-12289 (2000).
- Calogero A, Timmer-Bosscha H, Koops HS, Tiebosch ATMG, Mulder NH, Hospers GAP: Limitations of the nested reverse transcriptase polymerase chain reaction on tyrosinase for the detection of malignant melanoma micrometastases in lymph nodes. *BRIT J CANCER* 83:184-187 (2000).
- Carvalho GMJ, Alves TLM, Freire DMG: L-DOPA production by immobilized tyrosinase. *APPL BIOCHEM BIOTECH* 84-6:791-800 (2000).
- Claycombe KJ, Xue BZ, Mynatt RL, Zemel MB, Moustaid-Moussa N: Regulation of leptin by agouti. *PHYSIOL GENOMICS* 2:101-105 (2000).
- Decker H, Dillinger R, Tucek F: How does tyrosinase work? Recent insights from model chemistry and structural biology. *ANGEW CHEM INT ED* 39:1591+ (2000).
- Dell'Angelica EC, Mullins C, Caplan S, Bonifacino JS: Lysosome-related organelles. *FASEB J* 14:1265-1278 (2000).
- Dutkiewicz R, Albert DM, Levin LA: Effects of latanoprost on tyrosinase activity and mitotic index of cultured melanoma lines. *EXPEYE RES* 70:563-569 (2000).

- Espin JC, Veltman RH, Wichers HJ: The oxidation of L-ascorbic acid catalysed by pear tyrosinase. *PHYSIOL PLANT* 109:1-6 (2000).
- Fenoll LG, Rodriguez-Lopez JN, Varon R, Garcis-Ruiz PA, Garcia-Canovas F, Tudela J: Action mechanism of tyrosinase on meta- and para-hydroxylated monophenols. *BIOL CHEM* 381:313-320 (2000).
- ❖ Halaban R, Svedine S, Cheng E, Smicun Y, Aron R, Hebert DN: Endoplasmic reticulum retention is a common defect associated with tyrosinase-negative albinism. *PROC NAT ACAD SCI USA* 97:5889-5894 (2000).
 - ❖ Hallsson JH, Favor J, Hodgkinson C, Glaser T, Lamoreux ML, Magndtir R, Gunnarsson GJ, Sweet HO, Copeland NG, Jenkins NA, Steingr? sson E: Genomic, transcriptional and mutational analysis of the mouse microphthalmia locus. *GENETICS* 155:291-300 (2000).
 - ❖ Kerr R, Stevens G, Manga P, Salm S, John P, Haw T, Ramsay M: Identification of P gene mutations in individuals with oculocutaneous albinism in sub-Saharan Africa (vol 15, pg 166, 2000). *HUM MUTAT* 16:87-87 (2000).
- Kong KH, Hong MP, Choi SS, Kim YT, Cho SH: Purification and characterization of a highly stable tyrosinase from *Thermomicrobium roseum*. *BIOTECHNOL APPL BIOCHEM* 31:113-118 (2000).
- Kong KH, Park SY, Hong MP, Cho SH: Expression and characterization of human tyrosinase from a bacterial expression system. *COMP BIOCHEM PHYSIOL PT B* 125:563-569 (2000).
- Lambert J, Naeyaert JM, DePaepe A, VanCoster R, Ferster A, Song M, Messiaen L: Arg-Cys substitution at codon 1246 of the human myosin Va gene is not associated with Griscelli syndrome. *J INVEST DERMATOL* 114:731-733 (2000).
- Likhitwitayawuid K, Sritularak B, De Eknankul W: Tyrosinase inhibitors from *Artocarpus gomezianus*. *PLANTA MED* 66:275-277 (2000).
- Link BA, Fadool JM, Malicki J, Dowling JE: The zebrafish young mutation acts non-cell-autonomously to uncouple differentiation from specification for all retinal cells. *DEVELOPMENT* 127:2177-2188 (2000).
- ❖ Loftus SK, Pavan WJ: The use of expression profiling to study pigment cell biology and dysfunction. *PIGM CELL RES* 13:141-146 (2000).
- Martinez-Esparza M, Jimenez-Cervantes C, Solano F, Lozano JA, Garcia-Borron JC: Regulation of the murine silver locus product (gp87) by the hypopigmenting cytokines TGF- β 1 and TNF- α . *PIGM CELL RES* 13:120-126 (2000).
- ❖ Matsunaga N, Virador V, Santis C, Vieira WD, Furumura M, Matsunaga J, Kobayashi N, Hearing VJ: In situ localization of agouti signal protein in murine skin using immunohistochemistry with an ASP-specific antibody. *BIOCHEM BIOPHYS RES COMMUN* 270:176-182 (2000).
- Menasche G, Pastural E, Feldmann J, Certain S, Ersoy F, Dupuis S, Wulffraat N, Bianchi D, Fischer A, leDeist F, deSaintBasile G: Mutations in RAB27A cause Griscelli syndrome associated with haemophagocytic syndrome. *NAT GENET* 25:173-176 (2000).
- Petrescu SM, Branza-Nichita N, Negroiu G, Petrescu AJ, Dwek RA: Tyrosinase and glycoprotein folding: Roles of chaperones that recognize glycans. *BIOCHEMISTRY USA* 39:5229-5237 (2000).
- Saitoh S, Oiso N, Wada T, Narazaki O, Fukai K: Oculocutaneous albinism type 2 with a P gene missense mutation in a patient with Angelman syndrome. *J MED GENET* 37:392-394 (2000).
- Shotelersuk V, Dell'Angelica EC, Hartnell L, Bonifacino JS, Gahl WA: A new variant of Hermansky-Pudlak syndrome due to mutations in a gene responsible for vesicle formation. *AMER J MED* 108:423-427 (2000).
- Smith SD, Kelley PM, Kenyon JB, Hoover D: Tietz syndrome (hypopigmentation/deafness) caused by mutation of MITF. *J MED GENET* 37:446-448 (2000).
- Takeda K, Yasumoto K, Takada R, Takada S, Watanabe K, Udono T, Saito H, Takahashi K, Shibahara S: Induction of melanocyte-specific microphthalmia-associated transcription factor by Wnt-3a. *J BIOL CHEM* 275:14013-14016 (2000).
- Takeuchi S, Takeuchi T, Yamamoto H: A possible mechanism for feedback regulation of the mouse tyrosinase gene by its 3' non-coding RNA fragments. *PIGM CELL RES* 13:109-115 (2000).
- Udono T, Yasumoto K, Takeda K, Amae S, Watanabe K, Saito H, Fuse N, Tachibana M, Takahashi K, Tamai M, Shibahara S: Structural organization of the human microphthalmia-associated transcription factor gene containing four alternative promoters. *BBA GENE STRUCT EXPRESS* 1491:205-219 (2000).
- vanGastel M, Bubacco L, Groenen EJJ, Vijgenboom E, Canters GW: EPR study of the dinuclear active copper site of tyrosinase from *Streptomyces antibioticus*. *FEBS LETT* 474:228-232 (2000).
- Wang Y, Androlewicz MJ: Oligosaccharide trimming plays a role in the endoplasmic reticulum-associated degradation of tyrosinase. *BIOCHEM BIOPHYS RES COMMUN* 271:22-27 (2000).
- Wilkison WO: Regulation of the melanocortin receptors by agouti. *MELANOCORTIN RECEPTORS*. 475-490 (2000).
- ❖ Wolff GL, Roberts DW, Mountjoy KG: Physiological consequences of ectopic agouti gene expression: the yellow obese mouse syndrome. *PHYSIOL GENOMICS* 1:151-163 (1999).
- Xue BZ, Wilkison WO, Mynatt RL, Moustaid N, Goldman M, Zemel MB: The agouti gene product stimulates pancreatic β -cell Ca²⁺ signaling and insulin release. *PHYSIOL GENOMICS* 1:11-19 (1999).

MISCELLANEOUS

- Gasparro FP: Photodermatology: progress, problems and prospects. *EUROPEAN J DERMATOLOGY* 10:250-254 (2000).
- Kretzschmar D, Poeck B, Roth H, Ernst R, Keller A, Porsch M, Strauss R, Pflugfelder GO: Defective pigment granule biogenesis and aberrant behavior caused by mutations in the *Drosophila* AP-3 β adaptin gene ruby. *GENETICS* 155:213-223 (2000).
- Sakamoto T, Amitani I, Yokota E, Ando T: Direct observation of processive movement by individual myosin V molecules. *BIOCHEM BIOPHYS RES COMMUN* 272:586-590 (2000).