POSTER PRESENTATION

Poster 1

A REAL-TIME EXCITATION-EMISSION MATRIX FLUORESCENCE SPECTROPHOTOMETER FOR *IN VIVO* SKIN TISSUE DIAGNOSIS

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The existence of many endogenous fluorophores such as collagen and tryptophan inside the skin tissue enables its examination using auto-fluorescence. To properly characterize skin tissue using multiple fluorophores as biomarkers, it is necessary to excite the tissue at multiple excitation wavelengths to separate the overlapping emissions for different endogenous fluorophores. With a conventional excitation-emission matrix (EEM) fluorescence spectrometer, the measurement could take up to 30 minutes. The required time greatly reduced EEM's applicability in clinical use. In addition, this lengthy measurement potentially jeopardizes the reliability of the data due to patient movement and instrument stability over time. To enable EEM fluorescence technique for clinical assessment, a rapid system that is capable of real-time *in vivo* measurement is highly desirable. In this work, we proposed a novel EEM system capable of acquiring EEM spectra at 30 wavelength intervals within the spectral range for both excitation and emission. The system utilized a novel white light source with excellent spatial coherence and intensity within the visible to near-infrared region. Using this white light as excitation, an integration time of 1 ms is allowed to obtain emission spectra with sufficient signal to noise ratio. Spectral tuning is achieved using acousto-optical tunable filters (AOTFs). By instantaneously tuning the driving frequencies to the acoustic transducer, diffracted wavelength could be accessed rapidly and randomly. The complete system is expected to acquire an EEM spectrum within seconds. Preliminary system calibration data will be presented.

Category: Early experiments with well defined objectives/hypotheses

Poster 2

ANALYSIS OF THE PREVALENCE OF ALLERGIC CONTACT DERMATITIS TO SUNSCREEN: A COHORT STUDY

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Background: As the use of sunscreens becomes more prevalent, reports of adverse effects to sunscreens have increased. Objective: To analyze a patch test database for the prevalence of allergic contact dermatitis (ACD) to sunscreen. Methods: The database was searched for positive patch test reactions to benzophenone-3. Charts were also reviewed for those who were further tested to the sunscreen series. Results: Twenty-three of the 1,527 patients seen were tested to the

sunscreen series. Of these, only 4 patients had a positive reaction to a sunscreen chemical or to the product they were using. In addition, 8 of the 1,527 patients who had no specific history of sunscreen allergy reacted to benzophenone-3. Conclusion: ACD to sunscreen was found to be very uncommon (0.8%). Other final diagnoses included ACD to excipients such as fragrances or preservatives and suspected photosensitive disorders.

Category: Early experiments with well defined objectives/hypotheses

Poster 3

TEN-YEAR REVIEW OF INPATIENT CONSULTATIONS AT ST. PAUL'S HOSPITAL AND PROSPECTIVE CONSULT SERVICE ASSESSMENT: A TWO-PART STUDY.

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St. Paul's Hospital is a quaternary care hospital in the heart of downtown Vancouver, BC. A review was conducted of the St Paul's Hospital dermatology service inpatient consultation data over a ten-year period from 2001-2010. Historically, residents have recorded, in hardcopy format, the following for each completed consult: diagnosis, attending physician, and date. For Part I of this study, that information was transcribed into a database and interrogated to explore trends in: most common diagnoses, temporal patterns in numbers of consultations with regard to day of week or month, and fluctuations in consult requests over the ten year period. The results were compared with a literature search exploring similar reviews of dermatology inpatient consultations at other institutions. In Part II of this study, we are conducting a six-month prospective evaluation of the consult service, which will gather more detailed information on consultation requests, including: the requesting service and care provider; urgency of the request (as assessed by both the referring team and the dermatology service); acceptance, triaging, or refusal of the request; timeliness of the dermatology team response; resulting diagnosis; and whether a biopsy was requested or performed. The primary purpose of this study is quality assurance. The results will be used to inform efforts to maximize the efficiency of the dermatology service to inpatients, and to target topics for continuing medical education activities that can be delivered to the services that frequently request dermatology consults.

Category: Pilot/exploratory experiments (for study design, hypotheses creation, etc)

Poster 4

VERTICAL SECTIONING IMAGING OF IN VIVO HUMAN SKIN AT VIDEO RATE

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Morphological information plays the most important role for skin disease diagnosis. The development of reflectance confocal microscope (RCM) and multiphoton microscope (MPM) provide a non-invasive way to get morphological images of the skin in vivo. Most of the research are now focusing on getting images on the horizontal section. Although having lower resolution vertical section images are more helpful for dermatologists as they are oriented the same way as the histology images of skin biopsies. We developed one multimodal microscope which has the ability to realize vertical section imaging of in vivo human skin at video rates. RCM and MPM images can be obtained simultaneously providing complementary morphological information. The light source is a femtosecond laser with the pulse width of 130 fs. A resonant mirror is used to scan the laser beam at the x axis horizontal direction and a piezo actuator is used to accomplish z axis vertical scanning. We have successfully obtained vertical sectioning images from normal skin of healthy volunteers. We are developing methods to improve the z axial resolution aiming to get better quality images. After the system performances are optimized, its utility for skin disease diagnosis will be assessed through clinical studies.

Category: Early experiments with well-defined objectives/hypotheses

Poster 5

TREATMENT OF POSTERIOR CHEEK ENLARGEMENT IN HIV+ PATIENTS WITH BOTULINUM TOXIN A.

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Posterior cheek enlargement is very common in a subset of individuals infected with human immunodeficiency virus (HIV). This can lead to significant disfigurement and social stigmatization. Posterior cheek enlargement in HIV+ individuals has not been well characterized anatomically. Both the parotid gland and masseter muscle overlie the mandibular ramus, thus contributing to the lower facial contour. Although parotid enlargement is a common finding in HIV-associated salivary gland disease, masseter muscle enlargement may also contribute. The aesthetic appearance may also be due to apparent muscle enlargement attributable to facial lipoatrophy. Although parotid hypertrophy is a common complication of HIV, treatment options are limited and ineffective. These include antiretroviral therapy, steroids, radiation and surgical resection of tissue, which can result in significant morbidity. Botulinum toxin is a highly efficacious, minimally invasive option for improving the shape of the lower face and jawline. A pilot study is being undertaken to better characterize posterior cheek enlargement in HIV+ patients and explore treatment with botulinum toxin A. We have used clinical, photographic and radiological evaluations to explore the biologic activity of botulinum toxin A for altered lower facial contour in HIV+ patients. Four HIV+ patients with posterior cheek enlargement have been treated with botulinum toxin A with good results. The effect has been long lasting even at 6 months post-injection, and well tolerated. This research may lead to a potentially less invasive treatment for posterior cheek enlargement in HIV+ patients, with advantages of a good result that

is long lasting with good tolerability and minimal risk.

Category: Early experiments with well defined objectives/hypotheses

Poster 6

EXPOSURE ASSESSMENT FOR SOLAR ULTRAVIOLET RADIATION (UVR) IN OUTDOOR WORKERS

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4. Faculty of Health Sciences, Simon Fraser University

Background: Skin cancer is the most common malignancy in Canada. Outdoor workers are at risk, but objective levels of exposure have not been characterized in Canada. The objective of this study was to measure exposure to solar UVR among outdoor workers using electronic dosimeters. **Methods:** Workers were recruited in summer 2013 via unions and companies with outdoor workers. Participants wore dosimeters that measured UVR exposure once/minute for 5 days. Data on skin cancer risk factors, demographics, and work characteristics was collected via questionnaire. Dosimeter data was converted to UV Index via spectrophotometer calibration, and Standard Erythemal Dose (SED) was calculated for each day. **Results:** Eight companies (78 workers) participated. Workers were mostly male (95%), Caucasian (95%) and young (mean age 38).Most workers had 5 sampling days (range 2-7). The mean SED was 2.3, with a range of ~0-19. UVR dose was highest in marine construction and lowest in wildlife officers. **Conclusions**: Exposure to solar UVR in outdoor workers in Vancouver is variable and differs by job type. Some outdoor workers are exposed to high levels of solar UVR at work.

Category: n/a (my study is an observational exposure assessment, not clinical or experimental)

Poster 7

A CONTROLLED STUDY TO DETERMINE TIME TO RESOLUTION OF INFLAMMATORY LESIONS USING AN OVER-THE-COUNTER DEVICE TO SPOT TREAT ACNE VULGARIS USING HEAT

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Handheld over-the-counter devices have become available for self-administered spot treatment of acne vulgaris lesions by patients. These devices utilize heat, light, or a combination of both. While these devices are widely available, accessible supportive efficacy and safety data are lacking. The primary objective of this study is to evaluate the time to resolution of individual mild to moderate inflammatory acne lesions with a hand-held heating device (Zeno^{R} Hot Spot) in

comparison to no treatment and benzoyl peroxide-treated controls. Secondary objectives of this study are to assess side effects and to determine patient satisfaction. The study will look at 2 randomized split face groups: (1) heating device versus no treatment and (2) heating device versus topical benzoyl peroxide 4%. Time to complete resolution (normal skin) of individual lesions will be determined based on clinical evaluation, serial photographs, and computer imaging software. Split-face Investigator's Static Global Assessment (ISGA) and acne lesion counts will also be used to compare overall improvement and resolution of inflammatory lesions during the study period. The estimated sample size required for the study will be 20 patients with 10 in each group.

Category: Early experiments with well defined objectives/hypothesis.

Poster 8

REAL TIME VISUALIZATION OF MELANIN GRANULES IN HUMAN SKIN *IN VIVO* USING COMBINED MULTIPHOTON AND REFLECTANCE CONFOCAL MICROSCOPY

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Localizing melanin granules within skin morphology is critical for examining and determining treatment for conditions characterized by hyperpigmentation, such as melasma and post-inflammatory hyperpigmentation (PIH), as well as for predicting response to treatment. In this study, we perform Multiphoton Microscopy (MPM), supplemented by concurrent Reflectance Confocal Microscopy (RCM), of both *in vivo* and *ex vivo* human skin. The inherent three-dimensional sectioning capability of MPM allowed us to identify granular highly fluorescent structures below the dermal-epidermal junction (DEJ). Histological processing and melanin staining revealed melanin granules that correlate well with the structure and morphological location of the granules observed in MPM, suggesting that MPM directly visualizes melanin granules. This was further reinforced by the consistency of the MPM excitation wavelength range and RCM reflectance properties of cell culture melanin with those of the granules. We expect that this discovery will be important for non-invasively and non-destructively visualizing and quantifying sub-epidermal melanin, thereby guiding the provision of appropriate treatment for different hyperpigmentation disorders.

Study Category: (3) Applied/functional experiments

Poster 9

SERPINA3N ACCELERATES WOUND CLOSURE IN A MOUSE MODEL OF IMPAIRED DIABETIC WOUND HEALING

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Granzyme B (GzmB) is a serine protease that accumulates in the extracellular fluids of chronic, non-healing skin wounds and is capable of cleaving many extracellular matrix (ECM) proteins that are crucial for wound healing. We hypothesized that GzmB-mediated ECM cleavage contributes to the impaired wound healing that is observed in diabetics. Excisional wounds were created on the backs of genetically-induced type II diabetic db/db mice and covered with semi-transparent dressings. SerpinA3N, a murine GzmB inhibitor, was administered topically and/or subcutaneously to the wounds every 3 days. GzmB was found to co-localize with mast cells in wound sites at the dermal-epidermal junction. Administration of serpinA3N accelerated wound closure. By day 35, 100% of serpinA3N-treated compared to 55% of vehicle-treated mice exhibited complete re-epithelialization. In addition, serpinA3N-treated animals had increase granulation tissues areas compared to vehicle-treated animals. In addition, more full-length ECM proteins and fewer cleavage fragments were observed in homogenized tissues from serpinA3N-treated mice. Using an *in vitro* bromodeoxyuridine cell proliferation assay, GzmB decreased proliferation of cultured fibroblasts, but had no effect on proliferation of cultured keratinocytes. These findings suggest that GzmB contributes to the pathogenesis of diabetic wound healing through the proteolytic cleavage of ECM and reduction of fibroblast proliferation that are essential for normal wound closure. As such, inhibition of GzmB may have therapeutic potential to accelerate the healing of chronic diabetic wounds.

Category: Applied/functional experiments

Poster 10

IMPROVED DIFFERENTIATION OF SKIN CONDITIONS BY POLARIZED LASER SPECKLE IMAGING

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Malignant melanoma, the number one cause of skin cancer death, is also the fastest increasing preventable cancer. Currently, the lack of an imaging modality to quickly and non-invasively analyse the functional and morphological characteristics of tissues is hampering clinical practice. In a previous study, Tchvialeva et al. were able to demonstrate that the measurement of scattered

laser light polarization off a skin lesion could provide useful metrics for distinguishing and diagnosing malignant melanoma. In this study, the utility of image speckle is investigated as an alternative versus free space speckle. A speckle pattern is a measure of intensity of reflected, random interference of a set of wave fronts. The image speckle device consisted of a 635nm laser, with orthogonal polarization images captured simultaneously via dual electronically controlled CCDs and optics. Skin phantoms produced to mimic the morphology of human skin were studied. Depolarization characteristics of the laser light were measured. The depolarization ratio, taking into account radial symmetry, of the speckle pattern was compared against roughness of the skin phantoms. Changes in bulk optical properties of the phantoms resulted in quantifiable changes in the depolarization ratio. Use of image speckle lead to a better differentiation between phantoms when compared to free space speckle.

Category: Early experiments with well defined objectives/hypotheses

Poster 11

TOPICAL IMMUNOMODULATION FOR THE INDUCTION OF TOLERANCE TO ALLOGENEIC SKIN TRANSPLANTATION

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Prevention of allograft rejection is a challenge for solid organ transplantation. Although the risk of rejection can be minimized by matching donors to recipients and maintained with immunosuppressive drugs, long-term usage of immunosuppressive drugs is associated with side effects. Regulatory T cells (T_{reg}) play important roles in modulating immune responses and inducing tolerance. The balance between alloreactive T cells and T_{reg} is the key to T_{reg}-based immunotherapy for improving transplant outcomes. Corticosteroids and vitamin D act on dendritic cells to induce T_{reg} and have been analyzed for use in promoting tolerance. However, traditional systemic administration of the drugs also comes with side effects and a safe method for inducing T_{reg} *in vivo* has not been described. Inducing immune responses through the skin, which contains a high frequency of dendritic cells, is more potent and less toxic than traditional systemic immunization. We hypothesize that topical immunomodulation (TIM) using calcipotriol (vitamin D analog) and betamethasone (corticosteroid) with alloantigen promotes T_{reg}-mediated tolerance to allogeneic skin grafts and may be used to ultimately prevent or delay graft rejection. Using ovalbumin (OVA) as the model antigen, preliminary data show that while OVA-specific T cells proliferated when mice were co-injected with OVA-specific CD4 T cells (intravenously) and OVA-expressing lymphocytes (within the skin, to model a cutaneous foreign antigen), TIM increased the percentage of T_{reg} in the proliferated cell population. Further assessment of TIM to prevent graft rejection is needed, but this may provide support for its use as a novel and safe method of tolerance induction.

Category: Early experiments with well defined objectives/hypotheses

Poster 12

IMAGE SEGMENTATION FOR MULTIPHOTON MICROSCOPY AND REFLECTANCE CONFOCAL MICROSCOPY IMAGING OF HUMAN SKIN *IN VIVO*

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Noninvasive microscopy of the skin can be achieved in reflectance and multiphoton modes to yield complementary images of the skin based on the optical properties of specific structures a molecules. One of the challenges of *in vivo* microscopy is the delineation (i.e. segmentation) of cellular and subcellular architectural features. In this work we present a method for combining watershed and active contours models for segmentation of multiphoton microscopy (MPM) and reflectance confocal microscopy (RCM) images of human skin *in vivo*. Firstly, a segmentation model built by watershed is introduced for obtaining the accurate structure of cell borders from RCM image. Secondly, a global active contours model is constructed for extracting the cytoplasm of each cell from MPM images. Thirdly, a local active contours approach is used for segmenting cell nucleus within MPM images based on the adjusted center calculated from both the cell border structure and the cytoplasm of each cell. Experiment results demonstrated that the boundaries of cytoplasm and nuclei can be obtained by our method with better accuracy and effectiveness. We are planning to use this method to perform quantitative analysis of MPM and RCM images of in vivo human skin to study the variation of cellular parameters such as cell size, nucleus size and other morphometrics with disease pathologies.

Category: Early experiments with well defined objective/hypotheses

Poster 13

WAVELENGTH SELECTION FOR PRECISE SKIN TREATMENT BASED ON FEMTOSECOND LASER IRRADIATION

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It has been demonstrated that femtosecond (fs) laser can offer precisely controlled skin treatment. It can potentially reduce the damage to normal tissues as compared to traditional laser therapy due to its nonlinear absorption mechanisms, which include two-photon absorption based photothermolysis and/or plasma generation. These two mechanisms may require different wavelengths for best clinical results respectively. In this project, we are studying the effect of wavelength on the mouse skin treatment by multimode optical tools, including reflectance confocal microscopy (RCM), multiphoton microscopy (MPM), and micro-Raman spectroscopy. The *ex vivo* mouse skins were irradiated by a tunable fs laser with wavelengths variable from 720 nm to 950 nm, but keep the same power level (75 mW) and irradiation time (10 s). The degree

of photodamages induced by different wavelength of fs laser light was assessed by RCM and MPM imaging. Micro-Raman spectroscopy was also used to evaluate the biochemical changes of the target tissue volumes irradiated by different wavelength of fs laser light. The experimental results would be helpful to guide the wavelength selection in our future studies.

Category: Pilot/exploratory experiments

Poster 14

PROGNOSTIC SIGNIFICANCE OF LIFR EXPRESSION IN HUMAN MELANOMA AND ITS ROLE IN CELL MIGRATION AND INVASION

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LIF is a pleiotropic cytokine, which plays biological functions in cell proliferation and differentiation. Deregulated expression of LIFR in several human cancers has been reported to date, but its role in melanoma is unknown. Here, we constructed tissue microarrays and examined the expression pattern of LIFR in melanocytic lesions at different stages, including 35 normal nevi, 61 dysplastic nevi, 292 primary melanomas and 149 metastatic melanomas. The Kaplan-Meier method was used to evaluate the patient survival. The univariate and multivariate Cox regression models were performed to estimate the hazard ratios (HR) at five-year and ten-year follow-up. We found that cytoplasmic LIFR expression had a significantly increased trend from normal nevi, dyspastic nevi, primary melanoma and metastatic melanoma ($P<0.001$). The escalated expression of LIFR was associated with a poorer 5-year and 10-year disease-specific survival in primary melanoma ($P <0.001$), LIFR was an independent prognostic marker for primary melanomas. In vitro wound healing assays showed that LIFR knockdown inhibited melanoma cell migration rather than cell proliferation, and LIFR regulated STAT3 rather than YAP and MAPK(P38) in melanoma cell migration, suggesting that LIFR might regulate melanoma metastasis through the STAT3 pathway. Our data indicate that LIFR may serve as a potential biomarker for melanoma patient outcome as well as a potential target of future therapeutics.

Poster 15

SYSTEMIC TREATMENT OF SJS/TEN WITH INTRAVENOUS IMMUNOGLOBULIN VERSUS CYCLOSPORINE

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Stevens-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN) are mucocutaneous reactions, typically to medications, that are associated with a high patient mortality. Controversy exists over which systemic treatments decrease mortality in patients with SJS/TEN. In this study we sought to determine whether intravenous immunoglobulin (IVIg) or cyclosporine is better for the treatment of SJS/TEN. We undertook a retrospective chart review of 71 SJS/TEN patients admitted to Vancouver General Hospital (VGH) between 2001 and 2011. Predicted SCORTEN mortality, calculated based on status at presentation at VGH, was compared with actual mortality for patients treated with cyclosporine or IVIg. The standardized mortality ratio (SMR) for patients treated with cyclosporine (n = 17) was 0.43, while SMR of patients treated with IVIG (n = 37) was 1.43. This difference suggests a mortality benefit to the use of cyclosporine when compared to IVIG in the treatment of SJS/TEN.

Category: Applied/functional experiments (animal models of disease and in vivo studies, etc)

Poster 16

OPTIMIZING EXTRACTION OF GENOMIC DNA/RNA FROM FORMALIN FIXED PARAFFIN EMBEDDED (FFPE) SKIN BIOPSIES USING COMMERCIALLY AVAILABLE ISOLATION KITS

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FFPE is the most available form of sample preservation in clinical laboratories and biobanks worldwide. It's often difficult to recover intact RNA or DNA from FFPE samples; due to factors such as fixation time and fixative PH. Also, these samples are of limited quantity. Thus, it's essential to identify the best methods for extracting the genetic materials. Several commercially available reagent kits offer the possibility of maximizing utilization of the clinical samples. The purpose of this project is to compare two commercially available DNA/RNA extraction kits to assess their ability to extract high quality DNA and RNA from the same starting materials using them for downstream applications such as sequence determination and gene expression analysis. For this, two mycosis fungoides FFPE skin biopsy blocks will be selected; one with higher expression of TOX gene than the other. Multiple 5-micrometer sections will be obtained from each block. The two extraction kits will be used, each from a different supplier, with heir manufacturer recommended protocols. The resultant DNA and RNA will be used for HLA genotyping and quantitative analysis of the TOX mRNA level. This experiment is expected to lead to comparative quality assessment of the two combined DNA/RNA extraction kits. The best kit will be then used for subsequent experiments in the evaluation of prognostic and diagnostic markers for skin cancers.

Poster 17

EVALUATING THE EFFICACY OF MICRONEEDLING IN THE TREATMENT OF ANDROGENETIC ALOPECIA – PILOT STUDY

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Androgenetic Alopecia (AGA) is known to cause significant distress for individuals especially for those who start losing their hair at a young age. The standard treatment of AGA has become Finasteride, as it has been shown to block the conversion of Testosterone to Dihydrotesterone, the active hormone responsible for the condition. Topical Minoxidil as well as the more potent 5-a reductase inhibitor, Dutasteride, have also been shown to be efficacious. A more permanent solution is Hair Restoration Surgery, but for many, the cost is prohibitive. Much debate has been made on the efficacy of Low Level Light Therapy. Recently, there has been a published study on the use of Dermal Microneedling used to enhance hair growth in these individuals. Microneedling is a relatively new treatment modality that is generating increased scientific interest. It has been shown to induce overexpression of hair growth related genes vascular endothelial growth factor, B catenin, Wnt3a, andWnt10 b. Many of these same cellular regulators have been shown to influence the wound healing process. Micrnoeedling involves the use of multiple needles all at the same length (0.5-2.5 mm) which are on a cylindrical drum or in a stamping machine. These are then used to induce micro-injury which causes controlled healing. We intend to execute a similar pilot study to determine whether this new modality is indeed efficacious in the treatment of Androgenetic Alopecia.

Category: Pilot Study/Exploratory experiment with well designed objectives/hypothesis

Poster 18

BLOOD PLASMA SURFACE-ENHANCED RAMAN SPECTROSCOPY FOR NON-INVASIVE OPTICAL DETECTION OF CERVICAL CANCER

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A label-free nanobiosensor based on surface-enhanced Raman spectroscopy (SERS) was developed for blood plasma biochemical analysis aim to develop a simple blood test for non-invasive cervical cancer detection. SERS measurements were performed on 60 cervical cancer patients and 50 healthy volunteers' blood plasma samples. Both empirical approach and multivariate statistical techniques, including principal components analysis (PCA) and linear discriminant analysis (LDA) were employed to analyze and classify the obtained blood plasma SERS spectra. The empirical diagnostic algorithm based on the integration area of the SERS spectral bands (1310-1430 and 1560-1700 cm^{-1}) achieved a diagnostic sensitivity of 70% and 83.3%; specificity of 76% and 78%, whereas the diagnostic algorithms based on PCA-LDA yielded a better diagnostic sensitivity of 96.7% and specificity of 92 % for separating cancerous samples from normal samples. This exploratory work demonstrates that silver nanoparticle based SERS plasma analysis technique in conjunction with PCA-LDA has potential for improving cervical cancer detection and screening.

Poster 19

ASSESSING AND MODELING SITE-SPECIFIC VARIATION IN CUTANEOUS AUTOFLUORESCENCE THROUGH EXCITATION-EMISSION MATRIX (EEM) SPECTROSCOPY

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Many endogenous skin fluorophores contribute to cutaneous autofluorescence including keratin, collagen, elastin, melanin, NAD(P)H FAD, and porphyrins. These fluorophores have been evaluated in a number of physiological and pathological processes such as aging, photoaging, psoriasis and skin carcinoma, and shown to exhibit characteristic features in skin autofluorescence. Cutaneous autofluorescence depends both on the excitation and emission wavelengths. Most studies of skin autorfluorescence have been performed using only a few excitation or emission wavelengths. Variations in skin fluorescence due to body sites have not been systematically investigated. In this study, we studied the autofluorescence properties of 10 anatomic skin sites (including forehead, cheek, nose, neck, palm, fingernail, dorsal surface of hand, dorsal surface of forearm, medial surface of arm and mid-back) using excitation-emission matrix spectroscopy. The excitation and emission wavelength ranges were 260-450 nm and 300-700 nm respectively at 5 nm intervals. The optimal excitation wavelength, the optimal emission wavelength, the peak intensity and the total autofluorescence intensity are quantified using a 7th-order two-dimensional polynomial model. It is found that there are significant variations among body sites. Two to four fluorescence peaks are identified for all the body sites studied; for example, the nail has two major excitation/emission peaks at 298/360 nm and 375/457 nm. For the dorsal hand there are two major peaks at 298/355 nm and 388/478 nm. Overall the nail has the highest while the dorsal hand has the lowest fluorescence.

Category: Early experiments with well defined objectives/hypotheses

Poster 20

PERIORIFICIAL DERMATITIS: A REVIEW OF 229 CASES

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Periorificial dermatitis (POD), also known as perioral dermatitis, is a cutaneous inflammatory disorder with an unknown etiology that commonly presents in children, young or middle-aged females. Although its pathogenesis is incompletely understood, it has been associated with the

use of both topical corticosteroids and cosmetics. A large chart review was completed of patients with POD seen at Vancouver General Hospital Skin Care Centre, University of British Columbia, between June 1, 2003 to June 1, 2013, with the aim of adding to the current understanding of POD, including potential etiologic factors, unique demographic information and effective treatment regimens. Charts with an ICD9 diagnostic code of 695.3 (Rosacea or Perioral Dermatitis) as reported to the British Columbia Medical Services Plan were selected, and those with rosacea were excluded. A total of 229 patients, ranging from 9 to 85 years of age, were included. Eighty-three percent of patients were female. The average age at presentation was 43. Fifty-one percent of patients presented with perioral involvement, 10% presented with periocular involvement, and 3% presented with perinasal involvement. Thirty-six percent of patients had POD for greater than 12 months at presentation. Systemic minocycline was the most common effective treatment in 66% of patients. In conclusion, the retrospective data is consistent with previous literature on POD. POD affects patients of all ages, occurs more frequently in female patients, and generally involves the perioral area. Treatment with minocycline is one of the most common successful therapies for POD.

Category: Early experiments with well defined objectives/hypotheses.

Poster 21

eIF4E, AN ADVERSE PROGNOSTIC MARKER OF MELANOMA PATIENT SURVIVAL, INCREASES MELANOMA CELL INVASION

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Human cutaneous melanoma is a life-threatening skin cancer due to its invasive nature and high metastatic potential. However, the mechanisms for melanoma invasion and metastasis are poorly understood. Human eukaryotic translation initiation factor 4E (eIF4E) has been shown to be associated with tumor progression in some cancers but the role of eIF4E in melanoma progression is not very well known. We examined eIF4E expression in 448 melanocytic lesions using tissue microarray and found that positive eIF4E staining was significantly increased in primary melanomas compared to dysplastic nevi, and further increased in metastatic melanomas. eIF4E expression was correlated with melanoma thickness and was inversely correlated with overall and disease-specific 5-year survival of all and primary melanoma patients especially those with tumor ≥4mm thick combined with metastatic melanoma patients. Multivariate Cox regression analysis also revealed that eIF4E is an independent prognostic marker. A significant increase in apoptosis was observed in melanoma cells after eIF4E knockdown. eIF4E knockdown in melanoma cells also led to a decrease in the expression of Bcl2 and mesenchymal markers such as vimentin, N-cadherin and α-smooth muscle actin (α-SMA) and an upregulation of cleaved PARP and cleaved Caspase3. Moreover, down regulation of eIF4E resulted in a decrease in both melanoma cell invasion and MMP-2 activity. Taken together our data suggests

the eIF4E may promote melanoma cell invasion and metastasis by inducing EMT and preventing apoptosis and also by increasing MMP-2 activity. EIF4E may also serve as a promising prognostic marker and a potential therapeutic target for melanoma.

Category: Early experiments with well defined objectives/hypotheses

Poster 22

ULTRA-HIGH RESOLUTION IMAGING SYSTEM FOR WIDE-AREA SKIN PHOTOGRAPHY: A NOVEL SYSTEM USING GIGAPIXEL TECHNOLOGY FOR MULTI-PURPOSE SKIN SURVEILLANCE

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Digital imaging has become an essential modality in dermatology for documentation, diagnosis and assessment of skin diseases. However, different skin disorders need various imaging requirements. For instance, melanoma requires high resolution detailed images of small lesions, while vitiligo or psoriasis requires capturing larger areas of skin. Although total body photography systems are currently available for skin surveillance, they are unable to provide efficient images for different purposes. To date, these systems require over 20 photographs taken at different poses. Not only this process is time consuming, but also the resolution of captured images is not high enough to zoom on suspicious lesions. Hence, there is additional need to capture lesion-specific images. In this project, we are going to investigate the feasibility of applying giga pixel photography, a technology offering ultra-high resolution of over 1 giga pixels (1000 times higher than the existing systems) per image. With such resolution, skin or lesion details on different areas can be zoomed in without losing image quality and there will be no need for additional images. This technology enables us to capture high resolution images from wide areas of skin within a single shot (in approximately 4 seconds) due to its large field of view, while preserving the size of the device small. If successful, at the next phase we will perform the stereovision technique to reconstruct high resolution 3D skin regions. We will use the technology for mole mapping, vitiligo and psoriasis assessment and expect to provide a convenient tool for various dermatology applications.

Category: Pilot/exploratory experiments (for study design, hypotheses creation, etc)

Poster 23

A PILOT STUDY TO DETERMINE THE SAFETY AND EFFICACY OF A COMMERCIALLY AVAILABLE TARGETED UVB DEVICE (LEVIA) IN THE TREATMENT OF LICHEN PLANOPILARIS

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Lichen planus is an inflammatory disorder of unknown etiology that affects skin, mucous membranes, nails, and hair. Lichen planopilaris (LPP) is the term used to describe lichen planus of the scalp. Patients present with irregular patches of hair loss with perifollicular erythema and scaling at the periphery of active lesions. Lesions are usually painful or pruritic. When untreated, LPP can progress to scarring alopecia. No hair regrowth will occur once follicles are destroyed. The pathogenesis of lichen planus is poorly understood. Although various medical therapies and modalities have been tried, LPP is often recalcitrant to treatment. High potency topical corticosteroids or intralesional corticosteroids are often used as first-line therapies. Patients who have extensive or rapidly progressive disease are often prescribed systemic therapy, such as hydroxychloroquine, tetracyclines, mycophenolatemofetil, andcyclosporine. Unfortunately, aside from inconsistent results, these therapies are associated with significant side effects. UVB therapy using a low-dose excimer 308 nm laser has been shown to significantly reduce the inflammatory activity of LPP. Subjects reported decreased erythema, pain, pruritus and hyperkeratosis. The proposed mechanisms include depletion of T cells and alterations in cytokine expression. Levia is a commercially available UVB phototherapy device for the self-treatment of itchy, scaly, psoriatic plaques. It is hoped that the UVB-induced immunosuppressive effects would be effective in reducing the symptoms associated with LPP. The purpose is to determine the safety and efficacy and safety of a UVB comb in the treatment of lichen planopilaris.

Category: Pilot/exploratory experiments

Poster 24

STEVENS-JOHNSON SYNDROME AND TOXIC EPIDERMAL NECROLYSIS: AN ANALYSIS OF TRIGGERS

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Stevens-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN) represent a spectrum of rare, acute and severe mucocutaneous adverse drug reactions characterized by extensive epidermal detachment. The mortality rates have been reported to be between 1-5% for SJS and 25-35% for patients with TEN. Early recognition and prompt withdrawal of the causative agent leads to improved patient survival rates. The aim of this study was to identify the medications most often implicated in triggering SJS and TEN as well as to determine the timeline of identification and removal of these triggers. A retrospective chart review was conducted on 64 patients admitted to Vancouver General Hospital with a diagnosis of SJS or TEN from 2000 to 2011. In 75% of cases, a trigger was identified. Allopurinol was the single most common offending agent, implicated in 20% of cases. Anticonvulsants and antibiotics made up the

majority of remaining triggers. Most often, the offending agent was removed at time of hospital admission or at time of diagnosis and not at the onset of symptoms. Emerging research has revealed genetic HLA subtypes associated with an increased risk of SJS/TEN in certain ethnic groups. This testing is available in Vancouver though it is unknown how often this is being utilized. In conclusion, increasing physician awareness of the early signs and symptoms of SJS and TEN, the triggers that cause it, and what investigations can be done to prevent it, are key to improving patient care and outcomes in cases of SJS and TEN.

Category: Applied/functional experiments