of the virus. The finding of 71% of MCCs being positive for MCPyV is consistent with the literature.

542 Stem Cell Marker ALDH1 Expression in Melanoma

RN Tawil, Q Ahmed, P Sochacki, N Khouri, E Levi. Wayne State University School of Medicine, Detroit, MI; John D. Dingell VA Medical Center, Detroit, MI.

Background: The issue of the expression of stem cell markers in melanoma is controversial. The recent publication of the aberrant expression of CD 20 in a subpopulation of melanoma-initiating cells also adds to the controversy (J Clin Oncol. 2008;26:2890-2894). Understanding and characterizing the various possible subpopulations within malignant melanoma and the dynamics of clonal dominance is currently being investigated to gauge the early and advanced characteristics of stem cell markers at these different stages. Aldehyde dehydrogenase-1 (ALDH1) has recently emerged as a possible marker for breast cancer, brain tumors and for identifying colonic stem cells in colorectal carcinoma. However, to our knowledge, ALDH1 has not been previously studied as a stem cell marker in melanoma.

Design: 35 patients were selected from a Veteran Administration Medical Center Hospital in Detroit, Michigan, with disease ranging from melanoma in situ, to nodular melanoma and metastatic melanoma. CD 20 and ALDH1 are two immunostains applied to the microslides prepared from paraffin-embedded tissue from these 35 patients.

Results: None of the cases (0/35, 0%) stained for CD 20. 20/35 cases (57%) stained moderately-to-diffusely for ALDH1 (staining 10-40% of the tumor cells). This group encompasses the patients with nodular and metastatic melanoma. 5/35 slides (14%) had focal-to-patchy staining for ALDH1, this group is comprised of the patients with early lesions (from melanoma in situ, up to Stage 1). Of these early lesions cases, 2/4 (50%) had subsequent advanced disease, or metastatic melanoma. 10/35 cases (29%) did not stain for ALDH1.

Conclusions: Our cases of melanoma do not show aberrant CD 20 expression, disproving the assumption of CD 20 as a marker for cancer stem cells in melanoma. However, ALDH1 was expressed in advanced melanoma, which translates to a higher percentage of melanoma cells being stem cell like. Fewer of the early lesions stained with ALDH1, but from the patient follow up of this group, 50% developed advanced disease. Therefore, ALDH1 can potentially be used as a prognostic stem cell marker to predict metastatic melanoma in early lesions.

543 Evidence of Regulatory T-Cell Immunophenotype in a Subset of HTLV-I-Associated Infective Dermatitis: An Early Sign of Progression?

CA Torres-Cabala, EML Li-Ning-Tapia, C Ramos, JL Curry, VG Prieto, F Bravo. UT - MD Anderson Cancer Center, Houston, TX; Universidad Peruana Cayetano Heredia, Lima, Peru.

Background: Infective dermatitis associated with HTLV-I (IDH) is a childhood eczema that rarely presents in adults. It has been postulated that IDH may represent a cofactor for the subsequent development of cutaneous adult T-cell leukemia/lymphoma (ATLL.) The status of CD25-positive regulatory T cells in this entity is unknown, despite the well-established fact that ATLL cells usually display a CD4, CD25-positive immunophenotype. Here, we report the histopathological and immunohistochemical findings of IDH in a cohort of affected children and adults from Peru.

Design: Sixteen skin biopsies from fifteen patients were examined. Patients ranged in age from 5 to 82 years. All the patients were positive for HLTLV-I by serology. Histological assessment and evaluation of CD3, CD4, CD8, and CD25 by immunohistochemistry were performed. CD25 expression was scored as focal (fewer than 10%), moderate (10 to 50%), and diffuse (greater than 50% of the lymphocytes.).

Results: The lymphocytic infiltrate was categorized as lichenoid (8/16 cases), superficial and deep perivascular (7/16), and mixed (1/16.) Neutrophils in stratum corneum, parakeratosis, and spongiosis were seen in 11/16 biopsies. Fibrosis of the papillary dermis was identified in 6/16 cases. Exocytosis of lymphocytes in the epidermis, at least focal, was present in all the cases. Folliculotropism was present in two cases. The lymphocytic infiltrate was predominantly composed of CD3-positive T cells. The epidermotropic cells were mainly CD8-positive T cells. Only very rare CD4-positive cells were present in most of the cases (10/16.) In six cases, a population of CD4-positive T cells was seen in the dermis showing focal epidermotropism. From these six cases, four (4/16, 25%) displayed a moderate to diffuse expression of CD25 by the infiltrating lymphocytes.

Conclusions: Our study demonstrates that a subset of IDH shows a population of CD4-positive, CD25-positive T cells with possible regulatory immunophenotype. This population may contribute to an impaired cell-mediated immune response and potentially to progression to ATLL. Expression of CD25 by a subset of IDH may have therapeutic implications in the management of these patients.

544 Stem Cell-Associated Markers Distinguish Melanoma from Malignant Peripheral Nerve Sheath Tumor

D Wagner, E Miller, Q Yang, G Scott, BP Rubin, J Huang. University of Nebraska Medical Center, Omaha, NE; University of Rochester Medical Center, Rochester, NY; Cleveland Clinic, Cleveland, OH; UCLA David Geffen School of Medicine, Los Angeles, CA.

Background: Melanoma can have varied histologic appearances and often causes diagnostic confusion. When melanoma metastasizes to deep soft tissue or internal organs, a major differential diagnosis is with malignant peripheral nerve sheath tumor (MPNST) as both tumors may have spindle cell morphology and express S100 protein. The differential diagnosis becomes more difficult if additional melanoma markers such as melan A and HMB45 are equivocal. The cancer stem cell model states that a minority of cancer cells are cancer stem cells (CSC) with tumor initiation potential. However, melanoma is unique in that single unselected melanoma cells can initiate tumors in in-vivo models with high frequency, suggesting that melanoma cells have CSC properties. A previous study showed that stem cell-associated markers can differentiate melanoma from nevi. The current study was performed to determine if melanoma can be differentiated from MPNST with such markers.

Design: Two TMAs were used for the study, one containing 78 cases of melanoma and the other 68 cases of MPNST. The TMAs were stained with antibodies for EZH2 (VisionBio, 1:100), CD44 (eBioscience, 1:1000), SOX2 (R&D Systems, 1:100), C-Kit (Dako, 1:100) and Oct3/4 (BioCare, prediluted). Only tissue cores being at least 50% intact were scored.

Results: The results are summarized in Table 1. Among the stem cell-associated markers tested, SOX2 was expressed in 80% (55/69) of melanomas and 18% (12/66) of MPNSTs ($p<0.001$). C-Kit was expressed in 65% (50/76) of melanomas but none of the MPNSTs ($p<0.001$). Expression of other 3 markers was not statistically different between the two entities.

Table 1. Expression of stem cell-associated markers in melanoma and MPNST

	SOX2	EZH2	C-Kit	CD44	OCT3/4
Melanoma	80% (55/69)	87% (68/78)	65% (50/76)	100% (77/77)	0% (0/78)
MPNST	18% (12/66)	56% (38/67)	0% (0/48)	94% (62/66)	0% (0/67)

Conclusions: 1. Melanomas express stem cell-associated markers frequently, consistent with the laboratory observation that a single unselected melanoma cell can initiate tumor in in-vivo assays with high frequency. 2. A combination of SOX2 and C-Kit can differentiate melanoma from MPNST with high sensitivity and specificity.

545 Human Endogenous Retrovirus Type K (HERV-K) Envelope Glycoprotein Is Expressed in Melanoma

P Yan, D Whittemore, J Byrd, E Uzoigwe, R Rapini, G Johanning, F Wang-Johanning. University of Texas Health Science Center, Houston, TX; UT M.D. Anderson Cancer Center, Houston, TX.

Background: Expression of human endogenous retrovirus K (HERV-K) has been reported in melanomas and melanoma cell lines, and enhanced antibody against HERV-K has been shown to be present in sera from melanoma patients. Given its limited expression, it is proposed that HERV-K can potentially serve as a useful marker for melanoma. The aim of this study was to determine whether HERV-K surface glycoprotein is expressed in malignant melanoma (MM) and other melanocytic lesions using HERV-K env-specific 6H5 monoclonal antibody.

Design: Slides from 71 tissues were examined. Staining was performed using monoclonal antibody 6H5, prepared against HERV-K surface glycoprotein, and scored as 0 to 3+.

Results: There was a progressive increase in staining for HERV-K env among the primary lesions. Benign nevi were negative for HERV-K, and dysplastic nevi were mostly negative, with only 1/8 mildly dysplastic nevi (1+) and 2/4 moderately dysplastic nevi (2+) stained, only in the junctional component, with dermal nests negative. There was a significant difference ($p<0.0001$) in staining score between *in situ* melanoma (8 lentigo maligna & 4 malignant melanoma *in situ*) *vs.* the non-nodular MM group (6 lentigo maligna melanoma & 13 superficial spreading MM). There was less staining ($p<0.05$) of the lentigo maligna melanoma sub-group *vs.* the superficial spreading MM sub-group and also *vs.* the nodular melanoma group, but no significant differences between any other invasive melanoma groups. In all MM groups, the staining (mostly 2+ or 3+) extended and involved diffusely the dermal component. Though there was less intense staining in metastatic MM than in unpaired primary melanomas ($p=0.007$), all metastases were positive for HERV-K env glycoprotein.

Tissue	Positive / n	score ± SEM
Benign Nevi	0/10	0
Dysplastic Nevi	3/12	0.42±0.23
In Situ Melanoma	8/12	0.67±0.49
Non-nodular Malignant Melanoma	17/19	1.95±0.91
Nodular Malignant Melanoma	14/14	2.29±0.61
Metastases	4/4	1.25±0.50

Conclusions: HERV-K envelope glycoprotein is detected in melanoma tissues and that expression is associated with melanoma progression. Since activation of latent HERV could be linked with several cancers including melanoma, the expression of immunologically detectable surface glycoprotein might serve as a vaccine target.

Education

546 Use of Whole Slide Digital Images in Residency Education: Utility in Documenting Microscopic Feature Finding Skills

B Chaser, KM Fung, LA Hassell. Oklahoma University Health Sciences Center, Oklahoma City, OK.

Background: Whole slide digital imaging has been shown to improve undergraduate educational interaction with histologic and microscopic materials in significant ways. The role of WSDI in post-graduate, post-residency continuing education also appears to be evolving into a significant niche. The use of WSDI in residency level education has been little explored but may offer significant advantages in competency-focused training.

Design: We selected eighteen slides demonstrating a specific microscopic feature that required knowledge of the entity and microscopic locating skills. The slides were scanned as whole slide digital images (WSDI) using an Aperio scanner, and divided into two groups. Eight upper level residents were each given one group of slides as WSDI and one group as traditional glass slides and instructions to find the specified feature and photograph it for verification, using either the Imagescope photocapture tool, or a microscope mounted digital camera. The time required to locate the feature was recorded for each slide but the time needed for photography was not included. Results were stratified by post-graduate year, a subjective technology affinity score, media type (glass vs. WSDI) and case.

Results: Mean time to locate the feature was longer for WSDI in 14 of 18 cases, by a mean of 10 sec. Finding time overall decreased according to year of training as expected. The mean relative percent differences in finding times was 59% in cases where glass slides were faster, 31% in the four cases where WSDI were faster, and 40.4% overall. Finding times did not appear to correlate with the subjective technology affinity score.
Conclusions: WSDI are still a novelty to many residents and their skills in finding specific features using this media appear to differ from their facility in finding comparable features on glass slides. Features which can be located using scanning power may represent an exception to that, where the low power digital image may enhance finding. Digital slides viewed with an accompanying photocapture tool may offer an easy way to document specific microscopic finding skills in residency education. The speed with which WSDI can be manipulated using the current mouse and keyboard interface may be an impediment to rapid feature localization.

547 Implementation of a Whole Slide Image Database for Pathology Residency Education

B Dangott, AV Parwani. University of Pittsburgh Medical Center, Pittsburgh, PA.
Background: Training in pathology is dependent on gaining broad exposure to diagnostic patterns through teaching sets which are traditionally composed of glass slides. However, glass slides sets can degrade, they are only available to one user at any given time, and they are subject to being lost or broken. Whole slide imaging provides a solution to these problems by digitally capturing a glass slide at high resolution. These digital images can be integrated with the clinical history and viewed over the internet by many users simultaneously. The goal of the project was to facilitate pathology residency education by making these Whole Slide Images readily available to all residents in a geographically dispersed health system.
Design: Automated whole slide image capture was performed using both a Zeiss Mirax MIDI scanner (Carl Zeiss, Oberkochen, Germany) and an Aperio T2 scanner (Aperio Technologies, Vista, CA). The Aperio system spatial sampling period (the area of tissue section subtended by a pixel) was approximately 0.46 microns/pixel while the Zeiss system spatial sampling was approximately 0.26 microns/pixel. The images then were transferred to a server that was equipped with the vendor specific image serving software. Whole slide images from both vendors could be then be referenced via hyperlink. These links were integrated with the case histories and diagnoses in an Oracle 11g database via a Coldfusion application. The user front end internet application was also implemented using Coldfusion.
Results: Pathologists in training viewed the whole slide images through network connections on remote workstations via a web interface. This interface contained a listing of conferences organized by date and presenter. Within each conference the individual cases were presented with the case histories, links to the digital slides. The slide links open a web application which allows viewing of the whole slide images over the internet.
Conclusions: WSI technology is becoming more common in educational settings, but additional effort is required to implement WSI viewing as part of the diagnostic workflow. A comprehensive collection of digital whole slide teaching material where residents and pathologists are asked to make a diagnosis on the digital slide is a significant move toward implementing the technology in a clinical setting. This resource provides training for the residents in both anatomic diagnoses and in using the whole slide imaging systems.

548 Use of Web-Based, High Definition Autopsy Videos To Improve Resident Training and Medical Student Teaching

DS McClintock, JB Bakst, JB Taxy. University of Chicago Medical Center, Chicago, IL.
Background: With the decline of national autopsy rates over past years, pathology residency programs are faced with fewer available autopsies for resident training and ACGME requirements. Further, low numbers make medical student exposure to autopsy increasingly difficult, with most graduating medical students having limited or no autopsy experience. The lack of autopsy exposure for medical students and pathology residents diminishes and compromises the autopsy as an effective teaching tool and performance indicator for both clinical services and pathology departments. Consequently, physicians without autopsy experience as medical students are unlikely to seek its use during their practice years.
Design: To help increase hospital and medical school awareness of the autopsy, a pilot project was initiated to provide an online autopsy tutorial using high-definition (HD) digital videos and narrated presentations. An HD camcorder was used to record three full autopsies that were edited into multiple 1-3 minute, de-identified video segments. Audio voiceovers for the videos were created separately and added during the editing process. Screen recording software was used to create narrated web videos of PowerPoint presentations. The completed videos were placed on a password protected, institutional intranet server as well as being directly accessible on workstations in the autopsy suite.
Results: High-definition, exceptional quality videos were created for basic autopsy techniques starting from the organ block evisceration (Rokitansky method) and include dissection of individual organ systems. Pathology dependent variations on dissection technique were documented where possible. Narrated presentations were created detailing the indications for autopsy and pre- and post-dissection procedures. In addition to making these videos available for all clinical services in the hospital, they will be incorporated into the pathology curriculum for 2nd year medical students in January 2010.
Conclusions: The educational value of autopsy is not disputed but widely underutilized. The use of high-definition digital videos, in combination with pre-recorded procedural presentations, has potential to increase awareness of the autopsy as an important educational vehicle and clinical performance indicator. As the autopsy rate continues to decline, the use of high-definition videos as a visual aide for both medical students and residents may become an ever more important teaching tool in the training of future physicians.

549 Use of Virtual Microscopy and Online Lecture Recording To Improve Preclinical Teaching

DS McClintock, SD Stern, AN Husain. University of Chicago Medical Center, Chicago, IL.
Background: Medical students rely on web-based materials to augment their preclinical and clinical courses (Wikipedia, YouTube) in addition to traditional lectures and laboratory sessions. To address student needs for authoritative online materials, a pilot project was initiated to: 1) create a digital database of virtual microscope slides; and 2) record all lectures in the 2nd year pathology course for online review.
Design: Virtual microscopy and lecture recording were implemented over two years (2007-2009). Virtual slides were created using an Aperio slide scanner and then converted for use with the Zoomify Enterprise viewer. Lectures were recorded live with synchronization to PowerPoint slides using Camtasia Studio software and produced as three separate formats (web screencast, iPod video, and mp3 audio). All recordings were posted online within 1-2 days.

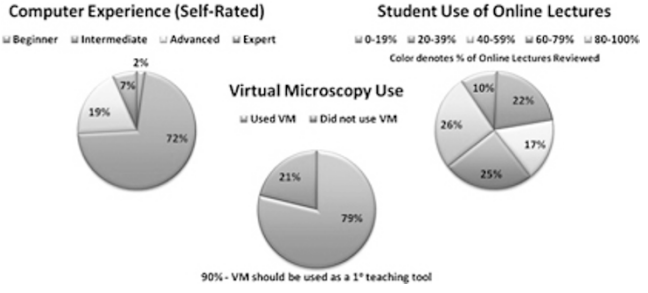
Figure 1

Results: Medical students were surveyed at the end of their 2nd year regarding their computing habits, use of virtual microscopy, and review of online lecture recordings.

MS2 Computer Access

Med School Class	Own a computer	Own a notebook computer
Class of 2008	100% (40/40)	95% (38/40)
Class of 2009	100% (64/64)	97% (62/64)
Class of 2010	100% (89/89)	96% (85/89)

Figure 2



Conclusions: Based on favorable reception of virtual microscopy and online lecture recording among medical students, efforts have been made to fully integrate these tools within all preclinical courses. This year, virtual microscopy is being used as the primary teaching tool in lieu of glass slides and an automated lecture recording system has been realized, with all 1st and 2nd year courses being posted online. These web-based resources have set the foundation for a searchable medical school virtual curriculum to be used during the preclinical and clinical years.

550 Flash-Based Interactive Glossary of Skin Reaction Patterns: A Digital Tool To Facilitate Training in Dermatopathology

J Miedema, J Woosley. University of North Carolina School of Medicine, Chapel Hill, NC.
Background: Many beginning dermatology and pathology residents find dermatopathology to be a daunting body of knowledge. One major factor causing resident intimidation is the multiple complex and varied reaction patterns that skin injury can produce.
Design: The goal of this project was to develop an interactive tool to help residents recognize and understand common skin reaction patterns. An inexpensive e-learning software program (Engage, Articulate Software, New York, NY), commonly used in the business world was used to create an illustrated and narrated interactive glossary of approximately 150 skin reaction pattern terms. These terms are arranged in alphabetical

order. Clicking each term reveals a photomicrograph illustration of the skin reaction pattern, accompanied by an explanatory narration. Study of the glossary by residents before beginning their dermatopathology rotation helps them develop pattern recognition skills in dermatopathology.

Results: This interactive glossary of skin reaction pattern terms was provided to dermatology and pathology residents at our school of medicine. Residents find that this self-paced introduction to dermatopathology increases their ability to understand and absorb the constellations of skin reaction patterns leading to specific dermatopathology diagnoses.

Conclusions: The accessibility of dermatopathology to beginning residents is increased by providing an interactive glossary of skin reaction pattern terms.

551 USMLE Step 1 Percentile Score Is a Predictor of the American Board of Pathology (ABP) First-Time Taker Failure Rate at the University of Pittsburgh Medical Center (UPMC)

J Picarsic, JS Raval, T Macpherson. University of Pittsburgh, Pittsburgh, PA.

Background: The UPMC Pathology Residency program is an ACGME fully accredited program. The training is based on a "Center of Excellence" model in which residents rotate through sub-specialty anatomic and clinical pathology rotations. The UPMC rolling pass average for the ABP exam is above the national average, but factors predicting success or failure are unknown. The aim of this study is to investigate if the USMLE Step 1 percentile score is a predictor for ABP performance in the UPMC pathology program.

Design: Nine years of data (2001-2009) from UPMC Pathology Residents (n=72) were collected from existing files and de-identified. Five residents with incomplete data were excluded from analysis, leaving 93.1% of the resident sample, including two residents with USMLE equivalent scores. Step 1 USMLE percentile score and ABP failure rate for first time takers were compared. Results are reported as percentage of residents who failed the ABP exam, cohorted by USMLE percentile scores (≤80, 81-85, 86-89, ≥90).

Results:

ABP failure rate cohorted by USMLE Part 1 percentile score.

USMLE PERCENTILE SCORE	TRACK	TOTAL RESIDENTS n	FAILURE RATE n (%)
≥90	ALL	21	0 (0)
81-89	ALL	32	8 (25)
≤80	ALL	14	6 (42.9)
≥90	US GRAD	13	0 (0)
81-89	US GRAD	14	5 (35.7)
≤80	US GRAD	3	3 (100)
≥90	IMG GRAD	8	0 (0)
81-89	IMG GRAD	18	3 (16.7)
≤80	IMG GRAD	11	3 (27.2)

Most recent 5-year ABP rolling averages (2004-2008), provided to UPMC.

First time takers		AP n (%)			CP n (%)	
	Pass	Fail	Total	Pass	Fail	Total
UPMC	38 (92.7%)	3 (7.3%)	41	30 (78.9%)	8 (21.1%)	38
National	2214 (82.8%)	460 (17.2%)	2674	1793 (73.8%)	637 (26.2%)	2430

Conclusions: At the UPMC pathology program, when residents scored ≥90 on the USMLE Step 1, there was a zero percent ABP failure rate, but there was a significant first-time taker ABP failure rate when the USMLE percentile score was ≤80. US medical graduates with USMLE percentile scores 81-89 had the highest ABP failure rate (35.7%), compared to other groups, including IMG graduates, when USMLE percentile score was <90 (Table 1). We consider this performance due to the fact that 24% of IMG graduates had at least two years of previous IMG pathology training. This data indicates that USMLE Step 1 percentile scores ≥90 and ≤80 are strong predictors of ABP first time failure rate in the UPMC program, while scores of 81-89 are less predictive.

552 Usage and Participation in a Resident-Built Virtual Slide-Based Atlas of Anatomic Pathology

R Ryan, V Brodsky, A Louissaint, J Gilbertson, Y Yagi. Massachusetts General Hospital, Boston, MA; Weill Cornell Medical College, New York, NY.

Background: Over the past year, residents and fellows in our training program have built an intranet-based "Virtual Slidebox" (VSB), a collection of annotated whole-slide images representing specific diagnostic entities. The hardware and network design of this project have been previously reported.

Design: We designed a resident-run workflow system for scanning slides selected by residents from their service work and didactic conferences, and uploading them with related content to the website. We implemented and modified the open-source WordPress MU blog engine to create a site which supports multi-user viewing, feedback, and modification of content, subject to curation by project editors and supervising faculty. Each whole-slide image is categorized by diagnosis and subspecialty, and can be linked to text describing clinical information and diagnostic features, as well as static images of ancillary studies. On-image annotation of whole-slide images is enabled. Users can also view random 'unknown' cases from within a subspecialty. We conducted a survey of all AP and AP/CP residents, as well as clinical fellows in anatomic pathology, to evaluate usage and contribution to the VSB over a three-month period.

Results: Our site has grown by approximately 100 whole-slide images per month over the first eight months of operation, to a total of 800+ posts as of 10/09. Of the survey respondents (n=24), 71% had visited the site in the prior 3 months, and 42% had used it 3 or more times. Individuals reported using the site on at least three occasions for general study, self-assessment, preparation for board exams, assistance in diagnosis of service cases, preparation for educational conferences, and instruction of colleagues. 100% of site visitors expressed confidence in the accuracy of VSB content. Respondents cited the desire to build a resource for their own reference and study use, and the desire to help other residents, as the strongest incentives to contribute to the project (81-86%), while the desire to demonstrate sub-specialty interests to staff, or to increase proficiency in informatics, were less strong incentives.

Conclusions: Implementation of a virtual slide-based, user-generated pathology atlas is possible on the level of a large residency program. Trainees find such a resource useful for numerous purposes, and are most willing to contribute to such a project to the extent that it benefits their learning, or that of other residents.

553 The Outcome of USCAP Abstracts

J Song, DH Hwang, RW Ricciotti, M Li, A Chang. University of Chicago, Chicago, IL.

Background: The scientific abstract program of the United States and Canadian Academy of Pathology (USCAP) annual meeting is an important forum for sharing recent advances in pathology, publishing over 1500 abstracts each year. Abstracts are a valuable source of information; however, full articles in peer-reviewed journals are generally considered to be more accessible and reliable. Knowing the outcome of published abstracts is of interest to both meeting organizers and attendees. The goal of our study is to analyze the outcome of USCAP abstracts in recent years.

Design: USCAP abstracts for the 2005 to 2007 annual meetings were downloaded from *Modern Pathology*, and processed by a PERL computer program. For each abstract, it searched PubMed with the first and last authors, within a 3-year date range starting from the October prior to USCAP meeting (abstract submission deadline). We then manually reviewed the research results to accept articles that are true matches, and to reject those unrelated to or not consistent with their query abstracts. This review process was greatly facilitated by the program that highlighted all matched keywords, and sorted articles by their likelihood of being true matches.

Results: Overall, 36% (1725/4824) of USCAP abstracts from 2005 to 2007 resulted in publication in peer-reviewed journals. The publication rates for various subspecialties are listed in Table 1. The top five journals with largest number of publications are: Am J Surg Pathol (16.2%), Modern Pathol (9.1%), Am J Clin Pathol (8.3%), Human Pathol (5.7%) and Arch Pathol Lab Med (4.0%). The average time from abstract to publication was 18.7 months, with 25% published in the first year.

Table 1: Publication rate of USCAP abstracts by subspecialty.

Subspecialty \ Year	2005 (%)	2006 (%)	2007 (%)
Autopsy	10	21	12
Bone & Soft Tissue	48	42	38
Breast	36	27	32
Cardiovascular	60	38	37
Cytopathology	37	32	34
Dermatopathology	57	32	48
Endocrine	38	28	41
Gastrointestinal	38	34	37
Genitourinary	36	37	40
Gynecologic	38	40	34
Head & Neck	47	43	29
Hematopathology	46	42	36
Infections	40	47	38
Kidney	41	34	37
Liver & Pancreas	35	31	31
Neuropathology	30	41	28
Ophthalmic	-	-	43
Pathobiology	41	36	31
Pediatrics	62	33	43
Pulmonary	26	26	23
Quality Assurance	31	25	23
Techniques	33	33	27
Ultrastructural	25	25	18

Conclusions: The publication rate of USCAP abstracts is comparable with other national meetings with published data, such as American Urological Association. Based on these data, more than half of the abstracts may never lead to full publications in peer-review journals.

554 An Intelligent "Virtual Signout" System for Pathology Training: An Efficient and Objective Approach Using Whole Slide Images

J Zhang, B Yang, C Johns, A Kulkarni, C Handorf. The University of Tennessee Health Science Center, Memphis, TN.

Background: There are several challenges in pathology residency training faced by both the programs and the trainees. These include: i) Programs and the board requirements focusing on total time of exposure and not necessarily the quality or duration of exposure to different entities and diagnoses. ii) The case exposure is not systematically structured to achieve efficient learning in all the desired areas. iii) Lack of an objective method for competency evaluation.

Design: To address these issues, we are developing a web based software solution that, backed by a large database of digitized images from archived cases, will simulate resident learning process. Case exposure is individualized and designed to avoid redundancy based on each user's diagnostic skills for multiple disease conditions. User performance is recorded and analyzed to provide objective, real-world evaluation of competency using different measures such as accuracy for diagnosis and ancillary studies.

Results: 134,000 cases from the recent archives at the University of Tennessee Health Science Center Pathology Department are scrutinized. pathology cases representing a wide variety of diagnosis are selected. Relevant case information, including gender, age, clinical history, specimen type and gross descriptions are extracted using scripting language PERL. Slides are digitized using Scascope®XT at 20X magnification. Website and database backend are constructed using Microsoft Visual Studio.

Conclusions: Initial user feedbacks suggest that the efficiency of pathology training can be improved by using the power of information technology.