#EDxConf24

THE 2024 EARLY DETECTION OF CANCER CONFERENCE REPORT

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CANARY CENTER AT THE STANFORD SCHOOL OF MEDICINE

OHSU KNIGHT CANCER Institute

CANCER RESEARCH UK

EXECUTIVE SUMMARY

Cancer early detection research is poised to transform patient survival, but significant hurdles stand in the way of translating new findings into clinical application. Among the challenges: deciding which populations are at greater risk and in need of screening, validating accurate biomarkers, discriminating dangerous early lesions from inconsequential growths, and developing tests that are sensitive enough to detect early cancers and specific enough to avoid false alarms and unnecessary treatment. The Canary Center at Stanford, the OHSU Knight Cancer Institute, and Cancer Research UK are collaborating to accelerate progress. The Early Detection of Cancer Conference is part of this collaboration. More than 300 attendees from academia, industry, policy and government gathered in San Francisco, California from 22-24 October 2024, for the eighth meeting in the series.

Scientific program chairs leading the conference were Utkan Demirci, Stanford University; Thuy Ngo, Knight Cancer Institute, Oregon Health & Science University; and Sam Janes, University College of London.

Utkan Demirci

Canary Center
Stanford University

Thuy Ngo

Knight Cancer Institute
Oregon Health & Science University

Sam Janes

University College of London

Day 1: Tuesday, October 22, 2024

In the opening keynote, **Peter Sasieni**, Queen Mary University of London, called for a revolution in cancer screening. Outlining that a revolution comprises visions, victims, and viaducts, he argued that cancer screening should move beyond binary, single-marker tests into a multilevel system various thresholds adjusted by risk factors, in the vein of a "fractional distillation" approach. To drive progress, Dr. Sasieni advocated for randomized trials embedded within routine care, with control samples stored for future use and only unblinding samples when a positive result is recorded. Dr. Sasieni also advocated for the adoption of alternative study endpoints such as advanced-stage cancer incidence and stage-based predicted mortality, both of which require shorter follow-up and smaller study sizes than the gold-standard endpoint of cancer-specific mortality. Recognizing that revolutions require doing the unprecedented and that not everyone will join in a revolution, Dr. Sasieni closed by urging that planning is needed now if we are to see significant progress over next 20 years.

How is biology informing early detection?

Chairs: Rebecca Fitzgerald, University of Cambridge; Sarah Mazzili, Boston University

The first session delved into how the biology behind disease or within the body can inform early detection of cancer. The first talk by **Jennifer Beane-Ebel**, Boston University, addressed critical unmet needs in early lung cancer detection, focusing on molecular and cellular changes in premalignant lesions. The research identified distinct molecular subtypes of bronchial lesions through RNA-seq. Her work showed that the bronchial brush samples from patients with more severe lesions showed increased expression of genes associated with high-grade basal cells. These findings suggest that epithelial cells can be collected from the field of injury and that these molecular subtypes can be used to detect the presence of precancer in the distal lung.

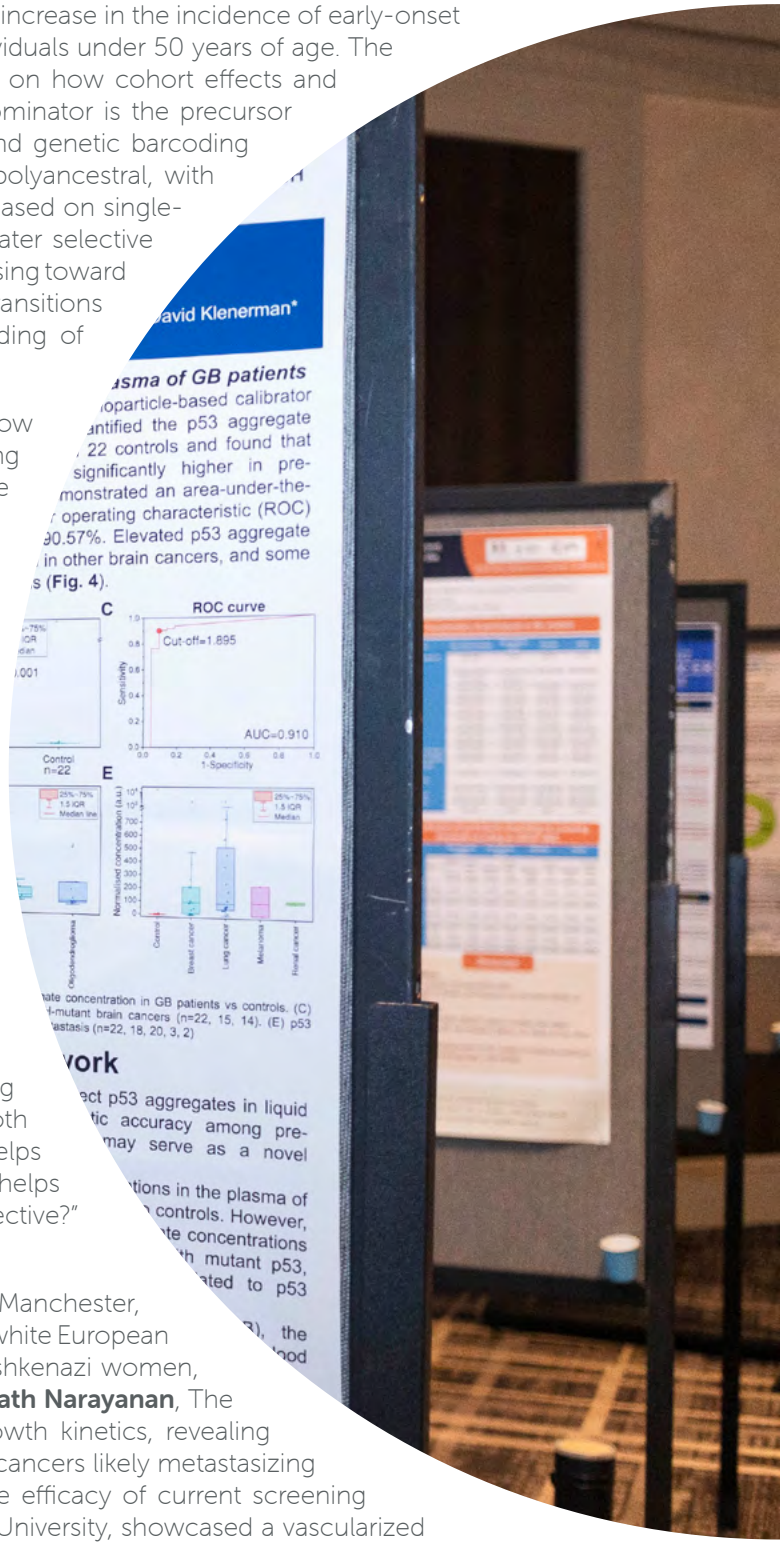
Angela Goncalves, Deutsches Krebsforschungszentrum, German Cancer Research Center, spoke about revisiting the cancer promotion model, explaining that carcinogenesis involves an initial mutation phase followed by a promotion process essential for tumor growth. Studies with DMBA and TPA in mice showed that mutations alone are insufficient for tumor formation and growth and instead, a promotion process drives tumors by increasing stem cell proliferation, inflammation, and immune infiltration. In her work, although cancer-resistant species like naked mole rats showed similar mutations to mice, the naked mole rats were able to maintain homeostasis and avoid tumor formation. Dr. Goncalves emphasized that since promotion is preventable, tracking early signs like inflammation or homeostatic loss, which are often linked to aging, could aid early detection. She ended by proposing that we should actually focus on early detection of aging, which not only aligns with early detection of cancer efforts but has several psychological advantages that fit with the growing anti-aging movement.

Ken Lau, Vanderbilt University, noted how there has been an increase in the incidence of early-onset colorectal cancer and particularly cancers diagnosed in individuals under 50 years of age. The talk then explored polyclonal precancer initiation, focusing on how cohort effects and macroenvironmental factors mean that the common denominator is the precursor stage of tumor development. Phylogeographic mapping and genetic barcoding in mice models revealed that some intestinal tumors are polyancestral, with around 30% of human polyps showing multiple ancestries based on single-cell SNPs analysis. The monoclonal polyps were under greater selective pressure, exhibited higher T cell exhaustion, and were progressing toward malignancy. These findings suggest that tracking mutational transitions from normal to precancer cells could improve understanding of cancer evolution and early detection efforts.

Finally, **Sarah Aitken**, University of Cambridge, explored how genetic background influences early tumorigenesis, focusing on findings from DEN-induced tumors in mice. Despite identical genetic and environmental conditions, tumors exhibited unique mutation burdens and a distinct "DEN" mutation signature, primarily affecting thymine bases. A key discovery was the presence of strand asymmetry, which also observed in human clinical samples. Computational pathology revealed that genome symmetry correlates with nuclear size. Taken together, these results reveal that genetic background strongly biases driver frequency, influencing genome integrity and oncogenic selection.

In the first PPIE Flash Talk, **Saumya Bollam**, University of California, San Francisco, and **Lluvia Del Rio**, patient representative, focused on enhancing the "impact factor" of scientific research through community-based participatory approaches. They emphasized the importance of including diverse voices to shape research priorities, ensuring that those affected by the work help frame key questions and share findings with stakeholders. The discussion stressed the need for follow-up after scientific meetings and fostering dialogue between scientists and advocates, reminding both scientists and advocates to keep key questions like "who helps scientists clarify the impact of their research?" and "who helps advocates access the information they need to be more effective?" in mind.

During the first lightning talks, **Eleanor Roberts**, University of Manchester, discussed how polygenic risk scores, developed primarily for white European populations, overestimate breast cancer risk in Black and Ashkenazi women, underscoring the need for more diverse GWAS studies. **Bharath Narayanan**, The University of Cambridge, presented on ovarian cancer growth kinetics, revealing that ovarian and omental tumors double rapidly, with many cancers likely metastasizing before annual screenings can detect them, questioning the efficacy of current screening practices. **Avathamsa Athirasala**, Oregon Health & Science University, showcased a vascularized



bone-on-a-chip model, which enables visualization of circulating tumor cells, helping highlight how microenvironments influence cancer progression and the functional consequences of nuclear deformation and damage.

Emerging technologies for cancer early detection

Chairs: Joseph DeSimone, Stanford University;
Billy Boyle, Owlstone Medical

Billy Boyle, Owlstone Medical, for George Hanna, Imperial College London, spoke about breath biopsy for non-invasive diagnostic testing. He highlighted advancements in using volatile organic compounds (VOCs) for disease detection, specifically through a dual VOC strategy that integrates both endogenous and exogenous VOC (EVOC) compounds. Several successful applications were highlighted, including the LIBRA test, which was designed for chronic liver disease and could identify ketones and terpenes as potential biomarkers. He also demonstrated how inverting a problem can lead to novel solutions, such as delivering an exogenous VOC probe to the cancer similar to how PET imaging agents work. In their LuCID study, they showed how D5-ethyl-glucoronide could lead to d5-ethanol expression if cancer is present.

Daniel Kim, University of California, Santa Cruz, highlighted the potential of RNA secreted in extracellular vesicles (EVs) for disease detection, emphasizing that billions of EVs exist in a single drop of blood. In particular, liquid biopsies can provide molecular insights and enable continuous monitoring. In his study, he saw that oncogenic RAS regulates repeat RNA secretion and discovered novel RNA isoforms in cell-free RNA, with cancer-specific repeat cell-free RNA signatures. Nanopore-seq further revealed over 280,000 unannotated cell-free RNA transcripts in esophageal cancer. Together, the combination of liquid biopsy technology and full transcriptome analysis enables discovery of novel cell-free RNA biomarkers that can be leveraged for early detection of (pre)cancer.

Otto Zhou, University of North Carolina, outlined how old technology can be further developed into modern technology with some examples with both non-medical and medical and cancer-related applications. For early cancer detection, conventional digital breast tomosynthesis (DBT) was developed into stationary DBT to offer higher spatial resolution and better visibility for small lesions. Multisource Cone Bean Computed Tomography (CBCT) has also been developed for precision treatment, improving the soft tissue contrast, increasing HU accuracy for adaptive radiation therapy, and reducing image artifacts. Dr. Zhou ended the talk by emphasizing how these advancements require interdisciplinary collaboration – with the advice to "don't sleep, work hard".

Finally, a **Teal Health** representative, discussed at-home cervical cancer screening and how the journey of at-home screening kits involves not just mailing the kit to the patient and getting samples back to the lab, but also the follow-up required after getting a positive result. Because experience matters when it comes to cervical cancer screening, the at-home cervical screening offered by the Teal Wand can improve accessibility whilst focusing on comfort. Initial results suggest with the combination of the Teal Wand and telehealth, 85% of those who receive an abnormal result attend a follow-up result.

In the second PPIE Flash Talk, **Ignacia Arteaga**, University of California, San Francisco, and **Emily Arteaga**, patient representative, spoke about how barriers to research participation are often assumed to lie in the community, but 46% are actually between research teams and community. Using a case study in Oregon as an example, they emphasized how having a community expert can help ensure cultural relevance and alignment with regional realities, bringing value to both the researchers and community. By breaking down barriers, gaining trust, and improving communication, a community expert can help strengthen trust and create a sense of familiarity and openness to increase participation representation in research on cancer early detection.

The second Lightning Talk session began with **Theodore Levin**, Kaiser Permanente Northern California, who shared how blood-based screening provides an additional modality to help increase screening for colorectal cancer. **Sravya Prabhala**, Northwestern University, spoke about chromatin-sensitive partial wave spectroscopic microscopy (csPVS), which was built on the concepts of field carcinogenesis and detecting chromatin structural alterations as a marker indicating the initiation of lung cancer. Then, **Leonid Nikitenko**, University of Hull, showed how a multiple protein biomarker panel derived from deep quantitative proteomic profiling of pancreatic cystic fluid (PCyF) could efficiently assign unbiased (cyst type-independent) malignant potential and risk-stratify heterogeneous pancreatic cystic lesions.

Panel Discussion: Global challenges in cancer early detection

Moderator: Bill Dahut, American Cancer Society

In the panel discussion, **Rob Bristow**, University of Manchester, **Jennifer Moodley**, University of Cape Town, and **Sok Ching Cheong**, Cancer Research Malaysia, discussed the influence of genetics, exposures, health systems, and community engagement on cancer detection. Jennifer emphasized the need for ongoing trust-building within communities and balancing communicable and non-communicable diseases. Sok highlighted the importance of inclusive research, stressing that Asian populations need better representation and technology must align with local contexts. Rob called for a team-based science approach, effective communication, and overcoming research infrastructure gaps. Panelists agreed that successful early detection efforts require understanding regional cancer patterns and leveraging diverse stakeholder contributions, embracing interconnectedness through principles like "Ubuntu", which means "I am because we are".

In the closing remarks of the first day, **Joseph M. DeSimone**, Canary Center at Stanford University, **Catherine Elliott**, Cancer Research UK, and **Brian Druker**, Oregon Health & Science University, commented on the transdisciplinary nature of the talks and how new sparks and new connections can help diverse disciplines and communities strengthen their interconnectedness. They also reflected on the late Dr. Sanjiv "Sam" Gambhir's quote about identifying patients early in the course of the disease, because it would be disingenuous to achieve early detection without appropriate early treatments and interventions.

Day 2: Wednesday, October 23, 2024

Keynote: New approaches to early detection of cancer

In his keynote address, **Steve Quake**, Stanford University, presented an update on new approaches to the early detection of cancer. The talk focused on advancements in cancer detection and biology, particularly through the role of hydroxymethylation (and specifically 5-hydroxymethylcytosines, or 5hmC). The hydroxymethylation method detects cancer-specific changes in cell-free DNA, offering high sensitivity and specificity, with applications in early detection, prognosis, and monitoring treatment responses, including predicting immunotherapy outcomes. Quake also discussed cancer evolution, highlighting how mutations can accumulate among pre-cancerous cells and then subsequently contribute to relapse. Analyses like bulk whole exome sequencing and single-cell measurements can reveal the actual order that the earliest tumor mutations are acquired by pre-cancerous cells for each individual patient, thus providing deeper understanding of cancer progression and aiding personalized treatment strategies.

Panel Discussion: Investing into the future: From Lab to Clinic

Moderator: Sanjay Malhotra, Oregon Health & Science University

Panelists **Michael Liang**, InVivium Capital, **Nitzan Rosenfeld**, Queen Mary University of London, and **Jenny Rooke**, Genoa Ventures explored the journey of translating scientific innovations from the lab to commercialization, highlighting the critical intersection of academics with venture capitalists and entrepreneurs. Rooke emphasized the importance of bridging the gap between early-stage research and commercialization through partnerships, rather than relying solely on venture capital. Liang added that academics may benefit from seeking out incubators and accelerators, which followed the theme that there isn't one "right" approach. Rosenfeld likened the journey to writing a paper, where you don't necessarily wait for the whole paper to be done before writing it, so you don't need to wait for all of the work and innovation to be completed before starting talks with investors and "kissing frogs". All of the panelists acknowledged that building a start-up is incredibly difficult and the importance of having opportunities to be exposed to other experiences outside of academic research.

Insights from Early Detection Trials

Chairs: Nima Nabavizadeh, Oregon Health & Science University; Allan Hackshaw, University College of London

The session began with some opening remarks from the moderators. First, **Allan Hackshaw**, University College London, noted how no two MCED tests are the same and the need to consider the types of participants included in each study, as well as paying attention to false-positive rates together with sensitivity. **Nima Nabavizadeh**, Oregon Health & Science University, followed by proposing that MCED diagnostic centers are needed as regional hubs to provide efficient and comprehensive diagnostic work-ups.

Scott Bratman, University of Toronto, spoke about moving cell-free DNA technologies toward the clinic. In his talk, Bratman explored the potential applications of using post-treatment ctDNA-based molecular residual disease (MRD) in guiding the use of adjuvant therapy, possibly leading to escalation or de-escalation of standard treatments. Some examples included using oncogenic DNA viruses as convenient archetypal ctDNA markers and demonstrating that epigenetic features within cell-free DNA can reveal distinct cell types and tumor-specific biology. Bratman ended by sharing some multi-cancer early detection tests currently under development that seek to achieve cancer detection and tissue-of-origin classification.

Tiffani Howard, Oregon Health & Science University, talked about integrating community engagement and trials teams into trials, first defining community as is working with people who identify as a group, while considering diversity and culture that exists within any group, and recognizing and addressing issues affecting the persons' well-being. Howard emphasized that communities are all starting at a difference place, and community engagement and trials teams can help meet them there. Such teams can not only use their established relationships, put diversity goals in the protocol, and offer strategies for recruitment, but they can also help maintain relationships after the trial and help with participant retention.

Along the same lines, **Kate Brain**, Cardiff University, followed by speaking about the value of including the patient and public voices in trial design and delivery, drawing on insights from behavioral research. She highlighted common barriers to participation—such as language, trust, access, and beliefs—and explained how the COM-B model (Capability, Opportunity, Motivation) can guide behavioral changes. Brain shared examples like the ABACus trial, which used a co-design process to enhance cancer awareness in deprived areas, and the YESS trial, which personalized

smoking cessation efforts through community-based lung screenings. She ended her talk with recommendations for including diverse voices, including diversifying research methods by using behavioral science frameworks, decentralizing trials and studies to address social determinants of health, and addressing preconceptions.

Rhian Gabe, Queen Mary University of London, closed the session by discussing how the TRANSFORM trial aims to conduct a multi-arm, multi-stage randomized controlled trial to evaluate various prostate cancer screening strategies. The trial involves screening through prostate health checks, with participants receiving MRI scans based on PSA thresholds or polygenic risk scores. The study comprises three stages: a three-year pilot and feasibility phase, a six-year effectiveness trial, and a ten-year long-term follow-up, assessing the proportion diagnosed with intermediate-risk prostate cancers, proportion who receive a prostate biopsy, proportion diagnosed with low-risk prostate cancer, and overall costs. While PSA-driven strategies that can prevent prostate cancer deaths can also lead to concerns of overdiagnosis, Gabe remarked that changes in practices may tip the balance between benefit and harm, and that new technology and risk stratification could bring us closer to a feasible screening approach.

In the PPIE Flash Talk, **Alice Groves**, University of Cambridge, discussed the role of public and patient involvement (PPI) in the ACED cohort study, which recruited pre-asymptomatic volunteers at risk of developing cancer into a pre-consented, recallable cohort. Since November 2021, the study has successfully recruited over 370 participants and collected more than 26,000 samples, maintaining an impressive 99% retention rate through annual recalls. PPI representatives became involved shortly after the study's initiation, contributing to the development of participant-facing documents and protocol adjustments based on early feedback. Ongoing feedback has led to further refinements, such as simplifying consent forms to eliminate barriers, the design of the collection containers, the use of more engaging language in tasks, and an updated demographic questionnaire to foster inclusivity. Overall, the PPI representative significantly improved retention, engagement, and recruitment, helping transform the communication strategy with the study population.

Next, in the Lightning Talks, **Peter Gann**, University of Illinois at Chicago, revealed results from the first-ever trial of risk-adapted PSA screening in a minority-serving community setting, showing that simple risk-adapted guidelines can be adopted and sustained by PCPs, leading to increases in biopsy rate and prostate cancer detection rate. **Charles Atwood**, VA Pittsburgh Healthcare System, shared initial findings of using the Galleri MCED test in the VA healthcare system where 70% of the population has toxic exposure. The longer-term data from the study will provide veteran-reported experiences with MCED testing and their cancer outcomes. **Richard Lee**, Early Diagnosis and Detection Centre, Royal Marsden Hospital & Institute of Cancer Research, spoke about how they engaged with behavioral science to set a recipe book to define and standardize targeted lung health checks in an effort to achieve the NHS goal of having 75% of lung cancers in the UK be diagnosed in the early stage by 2028.

Panel Discussion: The future of evaluation of cancer screening technologies

Moderator: Tom Beer, Exact Sciences

The panel discussion began with **Li Li,** University of Virginia, **Hilary Robbins**, International Agency for Research on Cancer, **Ruth Etzioni**, Fred Hutch Cancer Center, and **Adam Brentnall**, Queen Mary University of London, emphasizing the need to think creatively while establishing clinical utility. The panelists emphasized the lengthy conventional research-to-clinical application pathway – citing the PLCO trial as an example, they noted that the long trial lengths can result in the investigated technology becoming outdated by the time the trial ends. The panel called for innovative strategies to expedite this process while ensuring clinical utility. They emphasized the importance of cancer-specific mortality as a gold-standard measure but acknowledged its drawbacks. Alternative approaches discussed included nested mortality analyses and the use of intermediate endpoints. The need to measure potential harms associated with screening was also stressed, alongside trial design considerations, such as the significance of fast enrollment and efforts to mitigate contamination risks. Etzioni emphasized her belief that the future is a whole new ballgame, urging a re-evaluation of the current cancer screening framework and advocating for smaller trials with alternative endpoints. Although there was friendly disagreement on many points, the panelists agreed with a resounding "yes" to needing alternative approaches and a creative point of view in the future.

Great Debate: Research focusing on early detection of rare cancers is a waste of money

Moderator: David Crosby, Cancer Research UK

Representing the FOR side, **Paul Spellman**, UCLA, contended that the most significant impact on mortality can be achieved by focusing on the most common cancers – noting that the top 12 most-common cancers account for two-thirds of all cancer deaths. He pointed out the impracticalities of conducting large-scale trials for rare cancers, remarking that the incidence of rare cancers often necessitates a massive recruitment effort. Spellman expressed skepticism that the size of the early detection field could tackle all 200+ types of cancers and the feasibility of multi-cancer early detection (MCED) approaches, arguing that the specificity required would be unrealistic and not achievable within a meaningful timeframe. He also highlighted the challenges associated with the fact that most rare cancers are pediatric cancers, noting that trials for these populations are particularly difficult to conduct.

Conversely, **Emma Woodward**, University of Manchester, argued the CON side, stating that while rare cancers may seem uncommon individually, they collectively represent a significant portion of cancer diagnoses and account for 22% of all cancers diagnosed in the UK. She emphasized that because rare cancers disproportionately affect younger patients, early detection is crucial for maximizing lifespan potential, which also has significant long-term economical implications in terms of productivity. Furthermore, she pointed out that the lack of risk factors and existing trials for these diseases actually necessitates a focus on early detection approaches. Woodward underscored that all early detection is underpinned by an understanding of biology, and there is an excellent track record of taking that understanding and turning it into a detection technique – regardless of disease type and rarity. Additionally, detecting primary rare cancers in children is vital not only for immediate management but also for the early detection of secondary cancers.

Before the debate, 27% of meeting attendees agreed with Spellman, increasing to 43% after the debate. Despite a contentious UK vs US argument nearly breaking out mid-debate, Spellman and Woodward did end up agreeing on several points in the end.

The Don Listwin Award

Antonis Antoniou, University of Cambridge, was honored with the 2024 Don Listwin Award for his outstanding contributions to cancer early detection. Dr. Antoniou is a genetic epidemiologist and has made major contributions to the understanding of the genetic basis of common cancers and the development of cancer risk prediction models. In particular, he developed reliable cancer risk estimates for BRCA1, BRCA2, and PALB2 mutation carriers, leading to tools like the BOADICEA model and the CanRisk platform, both of which are now widely used in clinical practice. He continues to advance cancer risk prediction in frontline healthcare as director of multiple initiatives, including the CanRisk program and the Cancer Research UK, Cancer Data Driven Detection (CD3) initiative.

Day 3: Thursday, October 24, 2024

The final day of the 2024 Early Detection of Cancer Conference started with some remarks from Don Listwin, Canary Foundation, on the origins of the conference, tracing back to its first meeting at Don's home in 2003. Since then, the meeting continued to expand from the Canary Symposium to its current form today. The ultimate goal of the conference is to foster collaboration by bringing more companies and fresh ideas together, and Listwin stated that he is encouraged by the field's evolved focus on addressing the right problems.

Artificial Intelligence – promises vs. reality for early detection

Chair: Sylvia Plevritis, Stanford University Cathie Sudlow, Health Data Research UK

The session on AI was opened by session chair Cathie Sudlow, Health Data Research UK, with Sylvia Plevritis, Stanford University, noting how the natural history of cancer is hugely important and the potential of AI to unlock some of that knowledge.

Bissan Al-Lazikani, MD Anderson, discussed how foundation models in AI can aid early cancer detection by leveraging large datasets. She emphasized that AI's recent advances are enabled by vast, often unstructured data and that foundation models can overcome the need for structured data through self-supervised learning. These models can enhance the signal-to-noise ratio in omics data, identifying key molecular vulnerabilities and potential drug targets, even in rare cancers. She also highlighted the importance of multimodal data integration and predictive modeling to forecast cancer progression, likening it to hurricane path predictions. Al-Lazikani concluded by stressing that cancer detection tools must evolve, urging researchers to adapt their experimental designs to AI's capabilities and consider the question: AI is ready, are we?

Jens Rittscher, University of Oxford, discussed how imaging AI can improve quality assurance, diagnosis, and risk stratification. He highlighted the use of AI for endoscopic surveillance in Barrett's esophagus, automating Prague score calculations without altering clinical workflows. Rittscher also emphasized the need for improved pathology grading systems, as current ones are limited and not reflective of molecular disease progression, as well as the need to expand the multimodal approach and consider RNA expression in the context of morphological and pathological analyses. Rittscher concluded by outlining the potential of 3D analysis to enhance biomarker discovery and guide future research.

Su-In Lee, University of Washington, closed the session by showing the potential of explainable AI (XAI) early cancer detection. Through several examples, Lee demonstrated how AI models can analyze multimodal patient data to

detect subtle patterns and the use of XAI to understand why a model makes certain predictions. Lee also highlighted how XAI also plays a role in cancer therapy design, such as predicting drug synergies and uncovering transcription programs that guide combination treatments. She also showed how the Deep Profile model identified universally important genes across 18 cancers, revealing potential targets for immunotherapy, as well as work on creating a transparent AI model via an image-text foundation model grounded in medical literature. Through her numerous examples, Lee concluded that XAI offers immense promise in advancing cancer detection, presenting opportunities for accurate detection and prediction of early signals of cancer.

In the Lightning Talks, **Luoting Zhuang**, UCLA, presented a model integrating semantic and deep features for early lung cancer detection, leveraging fine-tuned contrastive language-image pretraining (CLIP) to improve performance, scalability, and explainability without the need for manually annotated data. **Felix Jackson**, University of Oxford, discussed a deep learning framework for cfDNA tissue deconvolution, utilizing TAPS sequencing to create a TAPS Atlas of tissue-specific markers for healthy tissues as well as tumor-specific markers. Liza M. Kurucz, The Netherlands Cancer Institute, outlined efforts to transition prostate cancer diagnostics from hospitals to primary care using AI-powered transabdominal ultrasound for automated prostate localization, segmentation, and volume estimation, with the goal to develop a fully automated handheld device for live prostate guidance and prostate volume estimation.

Keynote: The First Cell: Route for Early Detection and Prevention

In a moving keynote, **Azra Raza**, Columbia University, passionately emphasized the need for a revolutionary shift in cancer detection by focusing on identifying the "first cell" – the moment a normal cell transforms into a cancer cell. She highlighted the financial, emotional, and physical toll of failed cancer treatments and cancer trials, stressing the importance of proactive monitoring and early biomarker detection through AI and omics, starting with high-risk groups and cancer survivors. Raza proposed advanced technologies like smart stents and collaborative efforts like the Oncology Think Tank to create a transformative approach for cancer, advocating for strategies such as longitudinal sample banking and filtration devices to detect and isolate cancer-associated giant cells at their earliest stages. Reminding everyone that the patient should always be the priority, Raza ended by reiterating that detection of stage I cancer is not early detection and that the detection of the first cell is true early detection.

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Save the Date!

The 2025 Early Detection of Cancer Conference takes place 21-23 October, Portland Marriott Downtown Waterfront, hosted by OHSU Knight Cancer Institute, Cancer Research UK, and Canary Center at Stanford.

Save the Date

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