SRL NEWSLETTER

INTERNATIONAL SOCIETY FOR ADVANCEMENT OF CYTOMETRY (ISAC)

Newsletter Volume 4 Issue 2 **July 2023**

The Role of AI in Cytometry (Part 1)

AI has been the buzzword in the last few years and is making inroads into all spheres of life. It has an important role to play in cytometry too to augment the capabilities of human vision and analysis. The changes in cells, which might be too subtle to be perceived or quantified for a human eye can be accurately, assessed using computerized analysis. AI uses the power of computerized analysis in addition to training the model to identify subtle changes using available large image datasets. The power of AI to transform the way we deal with cytometric analysis is only limited by our imagination and it opens up new avenues for what kind of interpretation that we can derive out of it. Elimination of the need for staining or use of biomarkers could just be one of them. – Dr. Keerthana Prasad, Professor, and Director, Manipal Institute of Information Sciences, Manipal, Karnataka, India

In this issue of the SRL Newsletter, we asked individuals from industry and academics to tell us how they are using AI in cytometry and what the future might hold.

Ryan Brinkman, PhD
VP and Research Director, Dotmatics Inc.
Professor Emeritus, Dept. of Medical Genetics, UBC
Distinguished Scientist Emeritus, BC Cancer

Dr. Brinkman's research has been focused on developing cytometry computational software (e.g., flowDensity), infrastructure (e.g. Flow Repository, FlowCAP) and data standards (e.g., FCS data standards, MIFlowCyt). Dr. Brinkman has widely applied these tools to both basic

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research and clinical investigations including through Cytapex Bioinformatics Inc. that he founded and led until its acquisition by Dotmatics.

1. What do you think are the advantages to using AI in cytometry?
The volume, variety and speed of data generation is only going to increase, presenting additional challenges to current data analysis approaches, especially the generation of reportables (e.g., population counts and %) through manual gating. The advantages of AI includes that it can scale to these larger and more complex datasets (number of markers/populations analyzed per bivariate and number of FCS files) that are already being generated with the current generation of instruments and studies. Using AI in cytometry can not only offer performance advantages over current approaches in terms of scalability, but also in most cases, performance.

2. Currently, how is AI being incorporated into your system(s)?
We are currently focused on incorporating AI approaches to auto gating to both our flow cytometry analysis software platforms (FCS Express and OMIQ) as: (1) a completely automated approach using model pre-trained on the 650M+ bivariate dataset; (2) an approach leveraging one or more client-provided gating templates to augment the pre-trained model. Our general-purpose AI auto gating solution can gate every feature through all combinations of bivariate plots at a very high level of fidelity compared to manual analysis. Not quite as good as that obtainable by the state-of-the-art performance seen with the supervised flowDensity approach when it is customized to a specific panel, but close to that on most plots. We can also leverage a few user-provided gating templates to increase performance for the targeted cell populations of interest, leaving all remaining cell populations to be identified by the general-purpose approach.

3. What are your future plans for incorporating AI into your system/technology?
Auto gating will be linked to an auto labeling approach that will add labels (e.g., NK cells) to the identified cell populations, as well as community-wide computationally tractable IDs that will standardize naming of cell populations across groups. Together this will enable sophisticated queries across an organization's historical and future cytometry data, analyzed in a standardized way and directly linked to external data (e.g., patient outcomes, knowledge systems such as ontologies). This will significantly increase the return-on-investment organizations have made in R&D activities. Publicly available data on gating hierarchy sources including peer-reviewed publications and industry datasets are being used to develop the Cytometry Atlas of Populations Annotations.

4. What types of data are utilized for AI analysis in your system?
We are leveraging a dataset of over 363 million bivariate plots that were analyzed by over 671,000 player accounts associated with the massively multiplayer online role-playing game Eve Online over the last three years. Up to 1,000 gamers placed gates on a single bivariate plot (sourced from publicly available data, primarily FlowRepository) and a best consensus result was generated for each of the bivariate. The collection of consensus gates is then used to train AI auto gating algorithms. All training data will be made publicly available for any use.

5. Is the AI analysis done locally or in the cloud?
Both options will be available to clients.

Brian Hall
Cytek Product Manager Imaging Flow Cytometry

Brian Hall has been working with flow cytometry, confocal systems, and imaging flow systems for the last 25 years and has a number of patents and publications around the technology.

1. What do you think are the advantages to using AI in cytometry?
a. AI can function as a dedicated, trained scientist that preserves the expertise in the lab long after the scientist who trained the AI have moved on. This is critically important in an era where turnover is a big problem

for labs who do routine cellular analysis, but may lose their key scientist either through graduation, finding a new job, or retirement.

b. AI is great at high dimensional data analysis that can lead to new discoveries. With more and more colors and features being used in experiments, data analysis has become a time-consuming pain point for many labs. Because AI can view all the data at once, relationships between populations can be made more obvious than trying to create hundreds of bivariate dot plots to understand the results.

c. AI can simplify analysis. With high dimensional data sets, understanding each feature is difficult and time consuming to understand. With AI data analysis can be as simple as visually identifying the cell you are trying to capture and removing the ones you're not interested in, without the need for feature engineering and understanding how each one works.

2. Currently, how is AI being incorporated into your system(s)?
We use AI to identify cell types based on the morphology of the brightfield image, and the staining pattern of multiple fluorescent images. This allows us greater sensitivity in identifying subtle textural differences and distribution of molecular makers in many different cell types at once.

3. What are your future plans for incorporating AI into your system/technology?
We plan to continually fine tune our Amnis AI software, adding new algorithms and functionality to the software. This will also help us generate application specific AI models that will greatly simply data analysis for anyone looking for specific cell types.

4. What type of image/data input files are required for using AI?
Our software works seamlessly with ImageStream and FlowSight data formats. These are .rif, .cif, .daf files.

5. Is it a cloud-based storage system?
No, but there are many advantages to using a cloud system, namely users are not required to purchase expensive hard to get GPUs for their high-end computers. This is something we would like to add to Amnis AI

Paul Rees
Professor of Biomedical Engineering
Swansea University

His group works to develop algorithms for automated image analysis for microscopy imaging and for flow cytometry data. In particular, they are interested in drug discovery and repurposing using imaging and the detection of rare cells using flow cytometry.

1. How are you incorporating AI into your research?
We use AI in a range of applications from cell phenotype identification, cell cycle analysis, drug discovery and disease diagnosis.

2. Are you using AI for imaging or cytometry data? If yes, can you elaborate on how it is being used?
We use AI for flow cytometry, imaging flow cytometry and fluorescence microscope image analysis. All applications are based on classifying or predicting based on image or biomarker features.

3. What has been the biggest challenge in incorporating AI into your research?
Probably the biggest challenge of incorporating AI in our research is the lack of available annotated ground truth for the various biomedical applications. Training typical classification and regression algorithms require precise annotated ground truth data.

4. What are the next major issues/challenges with AI in your research?
The issue of obtaining well-annotated ground truth data will remain a challenge for the foreseeable future despite research into algorithms which elevate these issues. The issue of the explicability of solutions from certain

algorithms also hinder the uptake of these protocols.

5. What has AI allowed you to do that you could not do before?
The scale of the data we can now work with is the big advantage of AI that we have seen, this allows use to identify rare cells or observe detailed distributions or progressions of cell behaviour. Also, image analysis algorithms can pick out differences and features previously unobservable to the human eye and work at speeds allowing vast data mining.

6. Can you envision AI being used in a clinical setting?
Yes, I believe AI will be used in a clinical setting as an aid to make a diagnosis. The issue of explicability is an issue however these algorithms can certainly help as a guide to a clinician making a decision.

Uttara Chakraborty
Assistant Professor
Manipal Institute of Regenerative Medicine
Bangalore, INDIA

Since 2019, she runs the Stem cell Cytometry and Imaging lab at MIRM, which is committed towards interdisciplinary research where she uses the stem cells as ideal research models integrating with the concepts of computational biology, molecular mycology and clinical research to understand the potential of these cells in immunotherapy.

1. How are you incorporating AI into your research?
The Stem Cell Cytometry and Imaging Lab in Manipal Institute of Regenerative Medicine (MIRM), Bengaluru, works on human mesenchymal stromal cells and we study the morphometric characteristics along with the immunoheterogeneity of these cells. For our studies we are collaborating with the Manipal School of Information Sciences to develop pipelines that can automate the analyses of these features of MSCs isolated from a diverse source of tissues to look into both inter and intra-clonal diversity of these cells. We aim to use AI in developing a novel approach to differentiate the cells when they shall be applied for cellular therapies. We have collaborated with both academia and industry to work on another project and wish to extrapolate from our study an AI based pipeline for diagnosing Acute Leukemias.
2. Are you using AI for imaging or cytometry data? If yes, can you elaborate on how it is being used?
We work on human mesenchymal stromal cells isolated from dental pulp and umbilical cord tissues and use the tool of imaging flow cytometry to study the morphometric properties of single cells. So, we use different software/algorithms to extract feature information from these single cell images and plan to use AI to develop an unsupervised platform to screen multiple sources of single cell images that can predict stem cell potential for therapeutic usage.
3. What has been the biggest challenge in incorporating AI into your research?
I think acceptability of this concept of using AI to extract hidden cellular features is a big challenge especially when it comes to diagnostics.

4. What are the next major issues/challenges with AI in your research?
Data storage, data sharing, and maintaining data confidentiality. I have an overseas collaboration and there are challenges in data sharing with my international collaborators. An integrated portal named Biological Research Regulatory Approval Portal (BioRRAP), coordinated by the Department of Biotechnology, Government of India has regulatory policies under the Health Ministry Screening Committee (HMSC) for all approvals related to international collaborations in the area of health research. Such policies along with ethical clearances need to be kept in mind while working with data and using AI in data analyses. IP strategies need to be defined for the team of biologists and Information Technology (IT) professionals especially when the ML/AI based pipelines are generated in such interdisciplinary projects using human data sets

5. What has AI allowed you to do that you could not do before?

Cellular morphometric properties have been long explored but mostly at the cost of labelling the cells with varied markers raising the cost of assays and scope for human bias. AI has been used as a NextGen innovation, as seen in few recent publications, where label-free cell sorting using the Machine Vision-based cell sorting technology (ViCS) (www.thinkcyte.com) have expanded applications beyond what we can perceive.

6. Can you envision AI being used in a clinical setting?

In India, it will require many independent trial runs and lots of research publications which may convince the community of clinicians and diagnosticians to accept this AL based model systems in their settings. I am engaged in using this tool in diagnosing single cell images of “Blast populations” of Acute lymphoblastic leukemia (ALL). For this purpose, I have approached several Government Grant agencies with my PoC for funding, but it has reached success in few instances only. It’s a long way to reach the goals, but I am positive about it.

We would like to thank our interviewees for taking the time out of their busy schedule to answer our questions. Watch out for the October issue of the newsletter where we continue our discussion on the use of AI in cytometry!

2023 Recipients of ISAC SRL Recognition Program

Congratulations to the latest cohort of ISAC Recognized SRL's! The ISAC SRL Recognition Program is intended to promote sustained achievement of excellence in SRL operations and provide these SRLs with acknowledgement of these accomplishments along with access to development opportunities. Their successful applications highlight the hard work they have put in to build excellent flow cytometry shared resource labs and serve as a model for other aspiring labs.

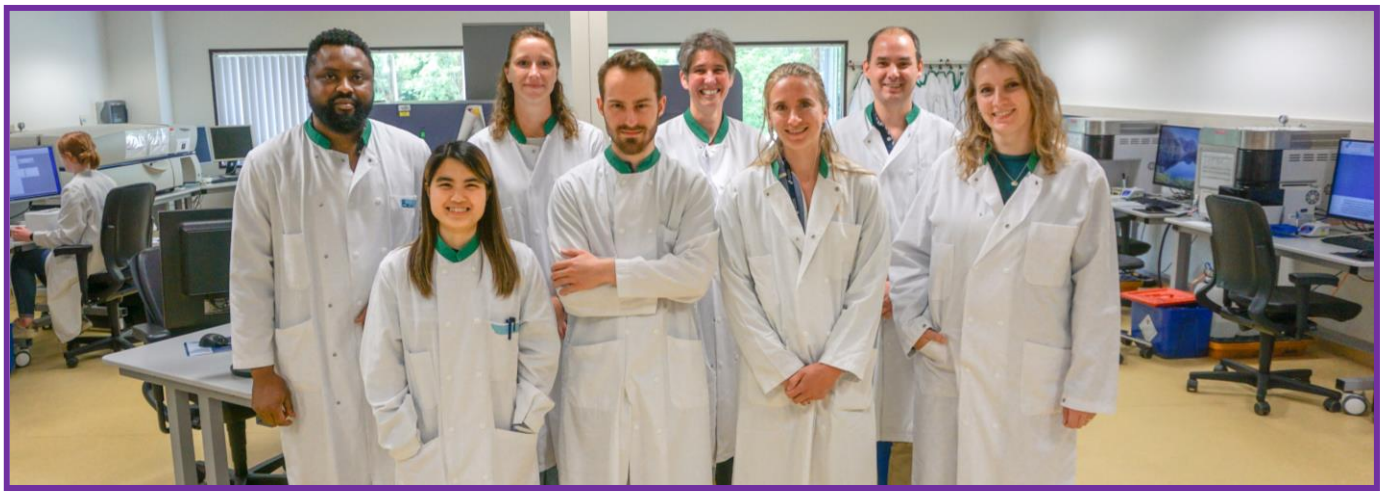
The next opportunity to apply for the Recognition Program is September 2023. For more information check out the ISAC SRL Recognition Program page.

We are excited to learn a little about the SRL Recognized Labs, so we asked each recognized SRL to tell us why they applied and send us a picture.

Babraham Institute Flow Cytometry Facility, Babraham Institute, Cambridge United Kingdom

The Babraham Institute Flow Cytometry Facility exists at the centre of a large and vibrant research campus comprising of the Institute and 60+ biotech enterprises. Our facility is open to all, on or off campus. This means that we have a varied workload where each day brings a new and interesting challenge. To meet this challenge we have a diverse range of flow cytometry instrumentation, with origins from seven different manufacturers, and we have seven technical specialists to run these instruments. Maintaining a high level of service is an ongoing and ever-changing effort; to recognise this effort we applied to the ISAC Recognised SRL Program. We believe that this recognition both celebrates the work we do and promotes the facility as a beacon of reproducible, robust, and trust worthy science. As an SRL, the ability to certify the high-quality work being done here is important and that is why we are proud to have been recognised by ISAC in 2023. We also endeavour to give back to the cytometry community; you can find many of our SOPs on the ISAC SRL SOP Repository, we organise dozens of external training sessions each year, we organise a spectral symposium, and freely output both tutorial videos on YouTube and analysis scripts on GitHub. Many of our staff are also actively involved in both ISAC and local cytometry societies, such as the RMS and Cambridge Cytometry Club and we are happy to work with other SRLs and actively encourage technician exchanges as we believe that the diversity of SRLs should be experienced by all.

LUMC Flow Cytometry Core Facility, Leiden University Medical Center, Leiden Netherlands



We chose to participate in the SRL recognition program because our facility has always had a strong focus on quality assurance and we felt that the SRL program is a great opportunity to gain feedback from others. The programs strict requirements and extensive feedback were an excellent way to see if our performance is up to the standard posed by guidelines from ISAC. Even though we did receive recognition, we received extensive feedback that will help us to further improve our services. Furthermore, we feel the status as recognized SRL will help us acquire additional external customers and collaborations. And lastly, our SRL has not been very involved with ISAC in the past, but we do have a strong desire to become more involved. Gaining SRL recognition has really felt like a warm welcome to the cytometry community.

Moffit Flow Cytometry Core Facility, Moffit Cancer Institute, Tampa FL USA

Since joining the Moffitt Flow Cytometry Core Facility (FCCF) in 1997, my perennial goal has been to build a shared resource that delivers state-of-the-art technology, expertise, and education to the research community at Moffitt Cancer Center. Long before the phrase was commonly used, our SRL staff was developing and instituting many of the “best practices” of a well-oiled Flow Cytometry core outlined in the Barsky et al. 2016 paper in an effort to provide the excellent services and technical expertise our customers deserve. The SRL Recognition Program provided the motivation to organize those efforts and seal them in a formal working mission statement that will benefit future generations of Moffitt FCC staff and users. The cherry on top has been the recognition by

the ISAC community. It's an honor that our esteemed colleagues in the field of Flow Cytometry recognize the Moffitt FCC as a pinnacle for excellence. We proudly display our award plaque in the SRL with the hope that it inspires our investigators to rise to same scientific excellence.

Penn Cytomics and Cell Sorting SRL, Perelman School of Medicine, University of Pennsylvannia, Philadelphia PA USA

Penn Cytomics is proud to be among the leading cytometry labs worldwide honored by the ISAC SRL Recognition Program. A major motivation for us to apply was to receive peer review of our operations and procedures, to ensure that we are stringently adhering to the community best practices in flow cytometry. In addition, we are enthusiastic about contributing our own expertise to the global community, particularly in the form of SOPs and cutting-edge software solutions for SRL management.

UAB Flow Cytometry and Single Cell Core Facility, University of Alabama at Birmingham, Birmingham AL USA

At UAB Flow Cytometry and Single Cell Core facility, our commitment is to provide high-quality services to the University of Alabama at Birmingham researchers. We decided to apply for the ISAC SRL recognition program as it offered a unique opportunity to evaluate our standard of operations by experts in the field. Recognition by peers and opportunities for ISAC community engagements are other

distinctive aspects of the program. The program will help us regularly review and update our operations based on current best practices in the field.

Westmead Cytometry, The Westmead Institute for Medical Research, Westmead NSW Australia

The program presented a valuable opportunity for Westmead Cytometry to undergo review by expert SRL scientists around the globe. Through this program, Westmead Cytometry was able to objectively review practices in place and, importantly, identify specific areas that could be improved upon, consequently, resulting in improvements in practices. Being acknowledged by ISAC instils confidence in our existing and future users, enhances Westmead Cytometry's potential to secure academic and commercial projects, and provides a high benchmark for quality assurance. The effort and time put in is well worth the recognition

ISAC SRL SOP Repository

The ISAC SRL SOP repository task force would like to highlight 4 SOPs from the Memorial Sloan Kettering Cancer Center in New York, each one describing a separate step in sorting on the SONY SH800 instrument. The first SOP describes startup, autocalibration and shutdown, the second describes setting up a new experiment, the third how to perform compensation on this instrument, and finally, the fourth describes sorting into 384 well plates. All SOPs are easy to follow and well described. If you use this instrument, you will find these SOPs very useful!

Many more SOPs can be found in the ISAC SRL SOP repository:
https://archive.org/details/@isac_srl

Would you like to have your own SOP's reviewed by core managers from around the world? Then submit your lab's favorite SOP here:
https://tinyurl.com/SOPRepositoryform

WORD SEARCH

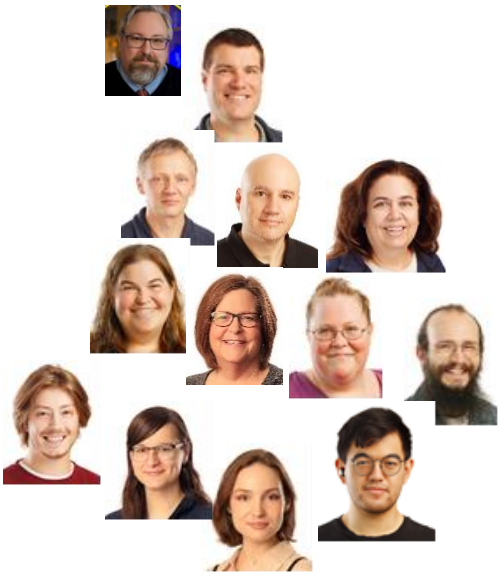
N Q D M T O Q E V A E Q X H A A A S
E B E O X Z V P L S M S P X D Y U L
S I Y S U E V R S P I L L O V E R X
R P P B N B W E A U S P G C A F B A
E E R T Y R L T V I S X N S I N N R
L L S E L R C E S M I F I O E T F E
F R C A A S F M T F O N T C I P L T
N E I Y L D U A M S N S R B S M U E
E C N E C S E R O U L F O T U A O M
J E D C B L L A J U W D S Z N R R O
P X K F M W L P P T Y R L Z M G O T
R E T T A C S E D I S I L Z I O P Y
K N O I T A T I C X E H E W X T H C
C O M P E N S A T I O N C K I S O W
F L U O R E S C E N T H M J N I R O
H Y D R O D Y N A M I C J L G H E L
G N I P Y T O N E H P O N U M M I F
N X R E T T A C S D R A W R O F W S

Antibody
Autofluorescence
Cell Cycle
Cell Sorting
Compensation
Doublets
Emission
Event
Excitation
Flow Cytometer
Fluorescent
Fluorophore
Forward Scatter
Histogram
Hydrodynamic
Immunophenotyping
Laser
Parameter
Side Scatter
Spillover
Spread
Unmixing

Highlighted Shared Research Laboratory
URMC Flow Cytometry Resource
University of Rochester, Rochester New York USA

Meet the staff

Tim Bushell, PhD - Director, URMC SRLs
Scientific Director, URMC Flow Lab
Matt Cochran, MS - Technical Director
Wojciech Wojciechowski, PhD – Development Director
Jim Java, PhD - High Dimensional Analysis
Beth Laffey - SRL Database Management
Meghann O'Brien - Lab & Operations Manager
Theresa Fitzgerald - Project Management
Terry Wightman - Project Management
Steven Polter - Instrument Specialist
Zachary Nowak - Instrument Specialist
Linaria Larkin - Instrument Specialist
Daria Stekolnikova - Instrument Specialist
Calvin Tian - Instrument Specialist



Instrumentation in the facility

We house an array of Muppet named instrumentation to help support URMC's research community.


Dr. Teeth and Camilla the Chicken
2 BD LSR Fortessas – 18 colors



Animal, Fozzie and Oscar
3 BD LSR IIs – 18 colors


Janice and Zoot
2 BD A1 Symphonys – 16


Sweetums and Constantine
Cytek Auroras
Sweetums – 5 lasers
Constantine – 4 lasers

Marvin Suggs
BioRad Bio-Plex 200

Pepe
BD Accuri C6+ colors

Big Bird
Luminex ImageStreamX MkII

Ludo
Standard BioTools Helios

Stinky
Nexcelom Celigo S

Bean Bunny
Malvern Nanosight NS300

https://isac-net.org/page/SRL

Lew Zealand
Agilent Seahorse Xfe96

Statler and Waldorf
BD Aria IIs

Scooter
BioRad S3e

Link Hogthrob
Cytek Aurora CS

What recent accomplishment in your lab are you most proud of?

We've had a lot of interesting things happening in the lab recently with new equipment coming in and projects beginning, but the part I'm most proud of is the development within our team here. The pandemic lockdown and the year or so afterwards were a time of extensive turnover within our group on top of the other stresses in the world. Because the science never stops, that was also a time when we were incredibly busy of course. That put a lot of strain on everyone and it was not an especially fun experience. However, we came out of that with a few new folks joining the lab and our team is really coming into its own. In about a year we lost and then gained 4 people which was half of the crew at that point. Since then we've also added one more person and we're operating at full strength for the first time in a while. Most of the new folks came in with little to no experience in flow and it has been a long trip, but the end result is really exciting. People are really starting to find their place and what aspect of the field they most resonate with so they can take that next step for themselves and our group. Of course, everything would have fallen apart if not for my more experienced people anchoring us when we desperately needed it. The whole thing was hardest on them and I couldn't be more thankful and proud of the way we worked through it to get to where we are.

What is the unique/odd sample have you analyzed in the facility?

Our facility is the only flow cytometry research "core" at the University of Rochester serving both the Medical Center, Cancer Center and the main campus, which comprises over 3,000 researchers so we get to see quite a few interesting things. There has recently been many brain tissue samples to sort which are always an interesting challenge because of the complexity of the tissue. We also recently got to run some dissociated mouse cardiomyocytes on the Image Stream which were impressive because of their size and shape, and made for some cool pictures.

One of the projects that I think is the most unique/impactful though is the human LungMAP project. The project began about 7 years ago, and the University has been a major center within the consortium throughout that time. The overall objective of the project is to "map" the lung and its development to create an open access reference that can be utilized by the larger research community in the future. While the goal of this project is massive and it will be hugely impactful, that is not what really set it apart for me. What set it apart in my eyes were the samples that were coming to the University to further this research effort. The researchers here were not receiving lung biopsies or lavage fluids to be analyzed. The samples that were coming in were whole donated lungs from donors that had passed away. The donated lungs came from a wide range of ages including neonates all the way through adults. They could come in at all times of day and night and our team worked closely with the LungMAP team to be on call and ready to assist as needed with sorting and analytical flow experiments. The project is ongoing, and the effort has shifted away from whole lung donations, but knowing how it got started it will remain as one of the most rewarding to be a part of.

Flow Star: Alfonso Blanco
Associate Professor
Director, The Flow Cytometry Core Technologies
University College Dublin

What do you think is your biggest contribution to the field of cytometry?
I think I have helped many scientists around the world to grow personally and professionally. I have been educating cytometry not just in English, but also in Spanish and Portuguese (Portugnol). Our initiatives with the Instrument4Science have upskilled cytometry communities and made more opportunities of work in science. In research, I have done a good contribution in the area of continuous flow and in the analysis of extracellular vesicles and other sub-micron particles using multiple scatter properties.

What is your favorite memory from CYTOs so far?
CYTO has many great memories for me. If I must choose just one, it would probably be a FlowJo private swimming pool party we had during CYTO2014 in Fort Lauderdale. May sound unprofessional, but CYTO/ISAC is built on friendship and this kind of parallel event generates the great pillars of our lovely and unique community and helps build life-long relationships.

What do you like to do when you are not in the lab, the most favorite pastime?
I have not a single doubt here: I love spending time with my family. Although I love travelling and I love going to meetings, conference, workshops, I miss a lot being with my family.

Who has been your favorite mentor? What was your biggest lesson learnt from your mentor?
Sonja Siljak Yakovlev at University of Paris-Sud was my favorite mentor who understood and identified my talent and redirected my career. At the end of my PhD, she called me to her office, and told me that I was a really bad researcher because I do not totally focus in my research topic, but that I was quite good understanding the technologies and able to troubleshoot technical issues, therefore, she suggested me to consider working as a technologist in a central service… and today here I am, I enjoy my work much as a hobby than a job!

Any message for the present day cytometrists?
You should have scientific curiosity and a passion for continuous improvement, fostering fun and camaraderie within the vibrant cytometry community and enjoying as much as you can each one of those actions. Learn, discuss, share, facilitate, help and enjoy.

Any advice to those who might want to establish an SRL
Talk to other SRLs, visit other core facilities, and learn from the manager and staff members, both the good and bad things… ISAC provides great opportunities for those trying to do it. Once you become an SRL manager, you should consider joining the ISAC SRL committee, applying for the SRL certificate, and of course applying for the SRL EL program, which will help you to further develop your career by providing you, access to great mentoring opportunities. This that most of the SRL managers/directors are happy to share our experiences and we'll also know others with different experience, and we'll be able to connect you with them.

Ask Old Dr. FITC

Dear Dr. FITC,
I manually compensate my data but my lab mates keep telling me not to do that. They want me to use the automatic compensation tools in our new flow analysis software, made by Skynet. I was wondering if there are any rules that I should follow when I try these tools.

John Connor

Dear John,
You came to the right place. Automatic compensation is the best way to compensate your data. There are rules of course. Just like the three laws of Robotics keep robots from taking over the world, the three laws of compensation controls will ensure your compensation is accurate. These are:

1. *Your compensation control is at least as bright as your experimental sample.*
2. *The background of your positive carrier is the same as the negative carrier.*
3. *The fluorochrome and settings must be identical between the experimental sample and control.*

If your controls meet these criteria, you should have no issues. Good luck with your experiments and remember that I'll be back … next issue answering more questions.

Dr. FITC

Complaint Department

While I understand the potential benefits AI can bring to scientific research, I have encountered several issues that I believe need to be addressed.

Firstly, the AI algorithms employed for data analysis often lack transparency. It becomes challenging to comprehend how the AI arrives at certain conclusions or classifications, leaving researchers uncertain about the reliability and accuracy of the results. As scientists, we value the ability to understand and explain the rationale behind our findings, and AI's "black box" nature hinders this crucial aspect.

Furthermore, the implementation of AI in flow cytometry data analysis can lead to an overreliance on automated processes. This can potentially undermine the critical thinking and expertise of researchers, as well as hinder the exploration of unconventional or unexpected findings. Relying solely on AI-driven analyses risks overlooking important nuances and insights that a human researcher could identify.

Lastly, I must mention the well-known line from HAL in 2001: A Space Odyssey, "I'm sorry, Dave. I'm afraid I can't do that." Though it is often used humorously, it reflects a genuine concern about the limitations of AI in complex scientific tasks. Flow cytometry data analysis often requires expert interpretation, troubleshooting, and adaptation to unique experimental conditions, which AI may struggle to handle effectively.

In conclusion, while AI shows promise in various scientific domains, its application in flow cytometry data analysis needs careful consideration. I urge the research community to maintain a balanced approach, combining the strengths of AI algorithms with human expertise to ensure accurate, transparent, and reliable results.

Anonymous, as written by ChatGPT

ISAC SRL related Events and Resource Links

If you, have a meeting/webinar that you would like to have included in the next newsletter please send the information to the Outreach Task Force at isacsrl.outreach@gmail.com.

Meeting	Dates	Link/Webinar
MAD SSCi Annual Meeting, Chapel Hill North Carolina, USA	Aug 9 – 11, 2023	https://madssci.abrf.org/
45th Annual Scientific Meeting of the Australasian Cytometry Society, Queenstown, New Zealand	Aug 28 – 30, 2023	https://cytometryconference.org.au/
Analytical Cytometry XII - Czech Analytical Cytometry Society, Prague, Czech Republic	Sept 2 – 5, 2023	https://www.conference.csac.cz/
Great Lakes International Imaging and Flow Cytometry Association (GLIIFCA) XXXII Meeting Madison Wisconsin, USA	Sept 8 -10, 2023	https://gliifca.org
33rd Meeting of the German Society for Cytometry (DGfZ) – Dimensions of Cytometry Berlin, Germany	Sept 19 – 21, 2023	https://dgfz2023.de/
38th Annual Clinical Cytometry Meeting and Course (ICCS), New Orleans Louisiana, USA	Sept 20 – Oct 3, 2023	https://cytometry.org/2023/
ESCCA 2023 Utrecht, The Netherlands	Sept 27 – 30, 2023	https://www.escca.eu/escca2023
NERLSCD 2023, Burlington Vermont, USA	Oct 18 – 20,2023	https://nerlscd.abrf.org
15th TCS Annual Conference & Workshop – 2023 – Flow Cytometry From Basics to Multi-omics AIIMS, New Delhi, India	Oct 26 – 29, 2023	https://tcs.res.in
26e Congrès de l'Association Française de Cytométrie, Toulouse, France	Nov 15-17, 2023	https://www.alphavisa.com/afc/2023/index.php
2023 NVC/SKML conference "Quality and development in flow cytometry" Odeon Theater, Zwolle, The Netherlands	Nov 28-29, 2023	https://cytometrie.nl/?page_id=1720

To View Recorded CYTO U Webinars And See What Exciting Webinars Are Coming In the Future, Go to https://learning.isac-net.org/

Interested in improving your flow cytometry knowledge?
Check out CYTO University interactive E-Learning Courses that lets the user learn at their own pace and time.
https://learning.isac-net.org/