8TH INTERNATIONAL WORKSHOP ON PLASMA FOR CANCER TREATMENT

IWPCT 2023 – Raleigh, NC, USA
March 13 – 15, 2023

Monday, March 13

08:30	Minicourse Registration
09:00	Welcome Mini-Course Plasma & Cancer
09:15	A. Privat Maldonado Plasma-induced cellular changes – cancer cells vs. normal cells
10:00	Sander Bekeschus Plasma treatment of cancers – ablation vs. immunotherapy
10:45	**Coffee Break**
11:15	Ali Mesbah Plasma devices as a controllable source of RONS delivery for cancer treatment
12:00	Cristina Canal Indirect plasma application
12:45	**Lunch**
13:45	Audrey Glory Plasma for oncotherapy – road to the clinic
14:30	Peter Friedman Lessons from clinical experience with treatment of precancerous lesions with plasma
15:15	**Coffee Break**
15:45	Panel Discussion
17:00	Final Remarks
17:30	Workshop registration
18:30	**Welcome Reception**

Tuesday, March 14

08:30	Workshop Registration
09:00	Welcome IWPCT 2023
09:15	Invited 1: E. Smits
09:45	Oral 1: H. Versyvel
10:05	Oral 2: M. Živanić
10:25	**Coffee Break**
11:00	Invited 2: E. Hartsough
11:30	Oral 3: L. Boeckmann
11:50	Oral 4: A. Pavy
12:10	**Lunch / ISC meeting**
13:15	Invited 3: E. Martínez
13:45	Oral 5: A. Espona-Noguera
14:05	Oral 6: E. Biscop
14:25	Poster Pitches (5 min. each)
15:15	Poster Session With coffee
17:00	Late Groundbreaking: J. Canady
17:30	Oral 7: L. Lin
17:50	Oral 8: A. Kazemi
18:10	Oral 9: S. Bekeschus
19:00	**Workshop Dinner**

Wednesday, March 15

08:30	Workshop Registration
09:00	Invited 4: C. Miron
09:30	Oral 9: J. Polito
09:50	Oral 10: B. P. Lopes
10:10	Oral 11: J. Sutter
10:30	**Coffee Break**
11:00	Invited 5: B. S. Kwon
11:30	Oral 12: V. Soni
11:50	Oral 13: I. Schweigert
12:10	**Lunch / ISC meeting**
13:15	Oral 14: A. Lin
13:35	Oral 15: T. Murakami
13:55	Oral 16: J. Polito
14:15	Oral 17: Z. Hou
14:35	Oral 18: A. Lin
14:55	**Student Award Closing Ceremony**

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WELCOME

We are delighted to welcome you to the Eighth International Workshop on Plasma for Cancer Treatment (IWPCT 2023), held in Raleigh, North Carolina, USA. Researchers from around the world are attending to discuss their latest developments for plasma cancer therapy.

As many of you know, the workshop was originally planned as the 7th IWPCT for March 23-25, 2020. Due to the COVID-19 pandemic we had to postpone the workshop. The last workshop, the 7th IWPCT, took place virtually. Back to in person meetings for the now 8th edition of the IWPCT we are even more excited to welcome you in Raleigh, NC!

We wish you a fruitful workshop and a pleasant stay in Raleigh.

Katharina Stapelmann
Chair of the local organizing committee IWPCT2023

PRACTICAL INFORMATION

WiFi: Get online with *eduroam* or *ncsu-guest*.
ncsu-guest is an unsecured wireless service for all University visitors. To connect: change your SSID to ***ncsu-guest***. Open a web browser to be redirected to ***Guest Wireless Access***. Click on the ***I Agree*** button.
eduroam: Only for guests who are already enrolled in *eduroam*. Connection to *eduroam* should be automatic.

Please upload your presentation slides **before** your session starts!

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iWPCT

Conference Venue: Talley Student Union

The Conference Venue is conveniently located on campus, a 10-minute walk from the Aloft hotel. The official address of the building is 2610 Cates Avenue, but it is more convenient to use the entrance on Dunn Avenue (next to the William Neal Reynolds Coliseum), see picture on the right.

The minicourse and the conference will take place on the 3rd floor in the Piedmont Ballroom. The welcome reception will be hosted on the 3rd floor in the Currituck Ballroom.

Conference Dinner: The Wine Cellar at Gravy's

135 S Wilmington St, Downtown Raleigh. Bus transfer (6:30 pm at Talley Student Union) from the Conference Venue and back will be offered.

Conference Material

The Book of Abstracts can be downloaded from the website:
www.iwpct2020.org/participant-information
The website is password-protected. The password will be shared with registered participants.
The material for the minicourse is available for download as well, the instructions will be shared with registered participants of the minicourse.

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Monday March 13: Minicourse: Plasma & Cancer

Talley Student Union, Piedmont Ballroom, 3rd floor

Organizers: Vandana Miller, Mounir Laroussi, and Annemie Bogaerts

09:00 **Welcome and Introduction to the minicourse.**
Vandana Miller (*Drexel University College of Medicine, Philadelphia, PA, USA*)

BASIC PRINCIPLES

09:15 **Plasma-induced cellular changes – cancer cells vs. normal cells**
Angela Privat Maldonado (*University of Antwerp, Belgium*)

10:00 **Plasma treatment of cancers – ablation vs. immunotherapy**
Sander Bekeschus (*INP Greifswald, Germany.*)

10:45 Coffee Break

METHODS OF APPLICATION

11:15 **Plasma devices as a controllable source of RONS delivery for cancer treatment**
Ali Mesbah (*University of California, Berkeley, USA*)

12:00 **Indirect plasma application**
Cristina Canal (*Universitat Politecnica de Cataluny, Barcelona, Spain*)

12:45 Lunch

METHODS OF APPLICATION

13:45 **Plasma for oncotherapy – road to the clinic**
Audrey Glory (*Montreal Cancer Institute, Canada*)

14:30 **Lessons from clinical experience with treatment of precancerous lesions with plasma**
Peter Friedman (*The Skin Center Dermatology Group, New City, NY, USA, Dept. Dermatology, Columbia University, NY, USA)*

15:15 Coffee Break

15:45 Panel Discussion

17:00 Final Remarks

17:30 Workshop Registration (Talley Student Union, 3rd floor)

18:30 Welcome Reception
Talley Student Union, Currituck Ballroom, 3rd floor

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Tuesday March 14

Talley Student Union, Piedmont Ballroom, 3rd floor

08:30 Workshop Registration

09:00 Welcome IWPCT 2023 (Katharina Stapelmann, LOC)

Session Chair: **Sander Bekeschus**, *INP Greifswald, Germany*

09:15 **Invited: Plasma: right partner for immunotherapy?**
Evelien Smits (*Center for Oncological Research (CORE), Integrated Personalized and Precision Oncology Network (IPPON), University of Antwerp, Belgium*)

09:45 **Oral: Elucidating the immunogenicity of NTP Combination Therapy in patient-derived organoids of head and neck cancer**
Hanne Verswyvel (presented by Abraham Lin) (*Center for Oncological Research (CORE), Integrated Personalized and Precision Oncology Network (IPPON) & PLASMANT, Department of Chemistry, University of Antwerp, Belgium*)

10:05 **Oral: Injectable plasma-treated hydrogel for immunogenic osteosarcoma therapy**
Milica Živanić (*Biomaterials, Biomechanics and Tissue Engineering Group, Escola d'Enginyeria Barcelona Est and Research Centre for Biomedical Engeering, Universitat Politècnica de Catalunya (UPC), Barcelona, Spain & PLASMANT, Department of Chemistry, University of Antwerp, Belgium)*

10:25 Coffee Break

Session Chair: **Vandana Miller**, *Drexel University College of Medicine, Philadelphia, PA, USA*

11:00 **Invited: Non-thermal plasma as a neoadjuvant for melanoma treatment**
Edward J. Hartsough (*Department of Pharmacology and Physiology at Drexel University College of Medicine, Philadelphia, PA, USA*)

11:30 **Oral: Combined cold gas plasma and experimental drug exposure exerts synergistic skin cancer toxicity *in vitro* and *in vivo***
Lars Boeckmann (*Clinic and Polyclinic for Dermatology and Venereology, University Medical Center Rostock, Germany*)

11:50 **Oral: Deciphering the direct and indirect antitumoral effects of cold atmospheric plasma – application to the cholangiocarcinoma**
Allan Pavy (*Sorbonne Université, Inserm, Centre de Recherche Saint-Antoine (CRSA), Paris, France*)

12:10 Lunch (Piedmont Ballroom) / ISC Meetings (Room #3223)

Session Chair: Camelia Miron, *Center for Low-temperature Plasma Sciences, Nagoya University, Japan*

13:15 **Invited: Bioprinting as a tool to mimic tumoral vascular microenvironment**
Elena Martínez (*Institute for Bioengineering of Catalonia (IBEC) & Consorcio Centro de Investigación Biomédica en Red de Bioingeniería, Biomaterials y Nanomedicina (CIBER-BBN) &*

Electronic and Biomedical Engineering Department, University of Barcelona, Barcelona, Spain)

13:45 **Oral: Evaluation of the therapeutic potential of plasma-treated hydrogels on pancreatic cancer tumors *in ovo***
Albert Espona-Noguera (*Biomaterials, Biomechanics and Tissue Engineering Group, Escola d'Enginyeria Barcelone Est and Research Centre for Biomedical Engineering, Universitat Politècnica de Catalunya (UPC), Barcelona, Spain*)

14:05 **Oral: The effect of non-thermal plasma on epithelial-mesenchymal transition in a 3D melanoma model**
Eline Biscop (presented by Abraham Lin) (*PLASMANT, Department of Chemistry, University of Antwerp & Center for Oncological Research (CORE), Integrated Personalized and Precision Oncology Network (IPPON), University of Antwerp, Belgium*)

14:25 Poster Pitches (5 min. each)

15:15 Poster Session & Coffee

Session Chair: **Evelien Smits**, *Center for Oncological Research (CORE), Integrated Personalized and Precision Oncology Network (IPPON), University of Antwerp, Belgium*

17:00 **Late Groundbreaking Results Presentation: Cold Atmospheric Plasma Engineering Physics For Treatment of Cancer**
Jerome Canady (*Jerome Canady Research Institute for Advanced Biological and Technological Sciences, Takoma Park, MD, USA & The George Washington University, Washington DC, USA & Holy Cross Health, Silver Spring/Germantown, MD, USA*)

17:30 **Oral: Plasma Sources Optimization using Machine Learning for Cancer Treatment**
Li Lin (*Department of Mechanical & Aerospace Engineering, The George Washington University, Washington DC, USA*)

17:50 **Oral: Flexible polyimide film surface barrier discharge (SBD) devices for low-voltage cold-plasma discharge and treatment of biological samples**
Ali Kazemi (*College of Engineering, The Pennsylvania State University, USA*)

18:10 **Oral: Modular nozzle system for a medical plasma jet augments toxicity and immunogenicity in tumor organoids by flow shaping**
Sander Bekeschus (*ZIK Plasmatis, Leibniz Institute for Plasma Science and Technology (INP), Greifswald, Germany*)

18:30 Bus transfer to Dinner

19:00 Workshop Dinner – The Wine Cellar at Gravy's

Wednesday March 15

Talley Student Union, Piedmont Ballroom, 3rd floor

08:30 Workshop Registration

Session Chair: **Cristina Canal**, *Universitat Politècnica de Catalunya (UPC), Barcelona, Spain*

09:00 **Invited: Chemical analysis of cold atmospheric pressure plasma-activated liquids for cancer treatment**
Camelia Miron (*Center for Low-temperature Plasma Sciences, Nagoya University, Japan)*

09:30 **Oral: Reaction mechanisms for plasma assisted oxidation and nitrosylation of cysteine in solution**
Jordyn Polito (*Department of Chemical Engineering, University of Michigan, Ann Arbor, MI, USA)*

09:50 **Oral: Direct Deposition of topotecan by cold plasma for localized chemotherapy delivery**
Beatriz Pinheiro Lopes (*Environmental Sustainability and Health Institute and School of Food Science and Environmental Health, Technological University Dublin, Ireland*)

10:10 **Oral: Interactions between non-thermal plasma and cancer cells**
Julia Sutter (*Institute for Molecular Medicine and Infectious Disease and Center for Molecular Virology and Gene Therapy, Department of Microbiology and Immunology, Drexel University College of Medicine, Philadelphia, PA, USA*)

10:30 Coffee Break

Session Chair: **Mounir Laroussi**, *Old Dominion University, Norfolk, VA, USA*

11:00 **Invited: Plasma-activated medium inhibits cancer stem cell-like properties and exhibits a synergistic effect in combination with cisplatin in ovarian cancer**
Byung Su Kwon (*Department of Obstetrics and Gynecology, School of Medicine, Kyung Hee Medical Center, Kyung Hee University, Seoul, South Korea*)

11:30 **Characterization of plasma devices and non-invasive treatment of glioblastoma using cold atmospheric plasma and plasma discharge tube**
Vikas Soni (*Department of Mechanical & Aerospace Engineering, The George Washington University, Washington DC, USA*)

11:50 **Oral: Optimization of pulsed voltage CAP Jet multiple treatment *in vivo***
Irina Schweigert (*Khristianovich Institute of Theoretical and Applied Mechanics, Novosibirsk, Russia*)

12:10 Lunch (Piedmont Ballroom) / ISC Meetings (Room #3220)

Session Chair: **Annemie Bogaerts**, *University of Antwerp, Belgium*

13:15 **Oral: Acquired non-thermal plasma resistance: a shift towards aerobic glycolysis and ferroptosis**
Abraham Lin (*PLASMANT, Department of Chemistry, University of Antwerp & Center for Oncological Research (CORE), Integrated Personalized and Precision Oncology Network (IPPON), University of Antwerp, Belgium*)

13:35 **Oral: Computational modelling on the mechanisms of plasma-induced cell death**
Tomoyuki Murakami (*Seikei University, Tokyo, Japan*)

13:55 **Oral: Prediction of atmospheric plasma jet "dose" needed to achieve planktonic cell death in solution**
Jordyn Polito (*Department of Chemical Engineering, University of Michigan, Ann Arbor, MI, USA)*

14:15 **Oral: Canonical correlation analysis for real-time diagnostics of cancer cell viability with impedance**
Zichao Hou (*Mechanical and Aerospace Engineering, The George Washington University, Washington DC, USA)*

14:35 **Oral: Plasma Treatment Dose: the role of plasma treatment energy in dictating *in vitro* biological response**
Abraham Lin (*PLASMANT, Department of Chemistry, University of Antwerp & Center for Oncological Research (CORE), Integrated Personalized and Precision Oncology Network (IPPON), University of Antwerp, Belgium*)

14:55 Student Award Ceremony, Closing

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Poster contributions

1. Exposure to helium gas discharge tube results in blood brain barrier disruption
   Ross Fladeland, Xiaoliang Yao, Tasneem Arsiwala, Kathryn Blethen, Cullen Wolford, Morgan Glass, Sahil Dave, Leah Dysktra, Brooke Kielkowski, Jonathan Sherman, Michael Keidar, Paul Lockman

2. Effect of cold atmospheric plasma on cell-to-matrix interaction in colorectal cancer
   Angela Privat-Maldonado, Evelien Smits, Annemie Bogaerts

3. Triple co-culture spheroid model of pancreatic cancer for plasma research
   Ruben Verloy, Angela Privat-Maldonado, Edgar Cardenas Delahoz, Steve Vanlanduit, Evelien Smits, Annemie Bogaerts

4. Local non-thermal plasma therapy on the cancer-immunity in melanoma-bearing mice
   Abraham Lin, Joey De Backer, Delphine Quantannens, Bart Cuypers, Hanne Verswyvel, Edgar Cardenas De La Hoz, Bart Ribbens, Jonas Van Audenaerde, Elly Marcq, Filip Lardon, Kris Laukens, Steve Vanlanduit, Evelien Smits, Annemie Bogaerts

5. Destruction of cancer cells by plasmas
   Laura M. Bouret, Jean-Baptiste Billeau, Derek H. Rosenzweig, Dao Nguyen, Michael H. Weber, Stephan Reuter

6. Optimizing hydroxyl radicals from cold atmospheric plasam jet for cancer treatment
   Ha M. Nguyen, Haoyu Cheng, Mali Ya Mungu Ocoko, Bindu Nair, J. Leon Shohet, Hau D. Lee

7. Determining the regenerative capability of hydroxyl radicals in different biological solutions via treatment by a cold atmospheric plasma (CAP) jet
   William Dunn, Mark Hurst, Mali Ya Mungu Ocoko, Ha M. Nguyen, J. Leon Shohet, Hau D. Lee

8. Determining the regenerative capability of hydroxyl radicals in different biological solutions via treatment by a cold atmospheric plasma (CAP) jet
   William Dunn, Mark Hurst, Mali Ya Mungu Ocoko, Ha M. Nguyen, J. Leon Shohet, Hau D. Lee

9. Tailored variation of COST-Jet generated reactive oxygen and nitrogen species
   María J. Herrera Quesada, Cameron Wagoner, Katharina Stapelmann

10. Real-time microscopy of cold atmospheric plasma on cancer cells and mechanisms involved in selectivity
    Alexander Horkowitz, Vikas Soni, Anmol Taploo, Zichao Hou, William Murphy, Li Lin, Michael Keidar

11. Cold atmospheric plasma treatment for neuroblastoma cancer
    Pina Fusco, Anna Fietta, Angelica Bastianello, Domenico Abate, Luigi Cordaro, Gianluca De Masi, Roberto Cavazzana, Emilio Martines, Matteo Zium, Elisa Cimetta

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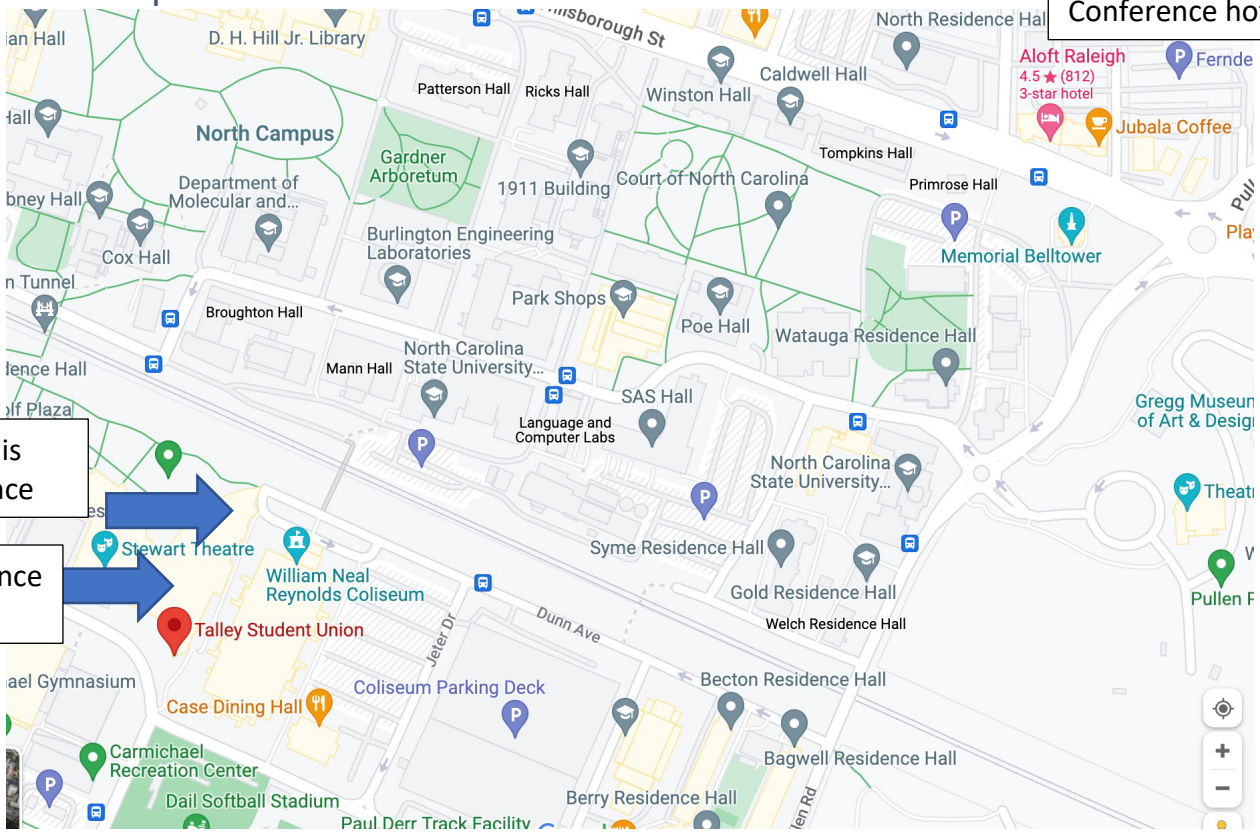
Area map:

ALOFT
Conference hotel



Suggested Walking Routes from ALOFT to the Conference Venue: