JULY 2021, ISSUE 1

ISTRY NEWSLETTER

International Society for Tryptophan Research

WHAT WE DO AND MISSION

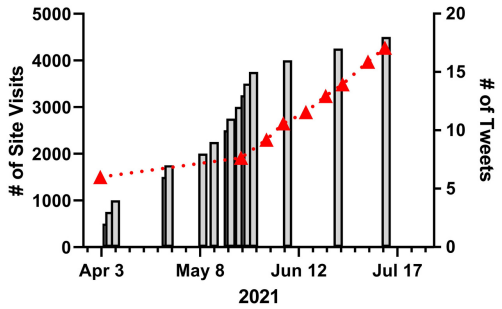
ISTRY is the premier international organisation for tryptophan research. For the past 47 years, we have been serving the tryptophan research community and we are committed to promote frontier research excellence and awareness into the tryptophan research field. It is hard to believe when I (and most of my colleagues) first came across this field and how restricted it was thought to be, considering that tryptophan is only one of the 20 amino acids! After over a decade of dedicated work in this field, I still find myself barely scratching the surface, and more importantly, there are still so many surprises and much more work to be done. Indeed, the tryptophan research field has now been amalgamated with a multitude of cross-disciplinary frontier research areas, such as cancer, neuroscience, immunology, microbiology, pharmacology, chemistry, and nutrition. The possibilities are seemingly endless! I am sure that many of you, my colleagues working in the tryptophan research field, will agree with me. Please do stay tuned with ISTRY and no doubt, you will encounter many exciting outcomes and opportunities that align with your area of research.

UPCOMING ONLINE MEETING

As travel is still not possible in the COVID-19 pandemic era, the ISTRY executive committee decided to keep in touch with the tryptophan research community by organising an online seminar featuring 3 speakers to talk about recent exciting developments in the tryptophan research space. We hope you can join us to partake in an exciting half-day program hosted by the Karolinska Institute. The online seminar is expected to happen in late September 2021. Registrations will open early August.

WEBSITE AND TWITTER

With the current ongoing pandemic, it is even more important that we all stay connected as a research community. ISTRY's mission is to facilitate these connections and we hope that our ISTRY website and social media presence via Twitter will be an avenue to connect not only with us and your fellow colleagues, but also be a conduit for new research ideas, continuing to grow and inspire the tryptophan research community.



Our website has a steady 2-300 visits per week, and we launched our Twitter account @ISTRY_media in early April. Please invite your colleagues and friends who are interested in tryptophan research to join our society and follow us on Twitter.

FEATURE ARTICLES

In April 2021, we launched our new website which has monthly feature articles that aim to capture exciting tryptophan research publications, thanks to our newly established ISTRY media team. Learn more about the media team below and see how you can promote your research through us to reach a wider and targeted audience for your research.

WHAT'S INSIDE THIS ISSUE:

COVID-19 AND TRYPTOPHAN RESEARCH

It has been over a year and a half since the first case of COVID-19 was reported in Wuhan, China, before making its way around the world. Through the course of the pandemic, COVID-19 has infected over 186 million people and caused more than 4 million deaths. Its immediate impact has extended beyond life and death, affecting our way of life, the global economy and international travel. It is not all bad news, COVID-19 has demonstrated the tenacity of medical research; with record-breaking turnarounds for the development and dissemination of COVID-19 vaccines that have provided protection to over 3 billion people worldwide. However, the long-term impacts of COVID-19 on our health are still largely unknown. The ISTRY EC thought that it would be of great interest to our readers to provide some insights on how TRP research may be involved in the pathology and long-term consequences of COVID-19 infection.

Apart from acute respiratory symptoms, we have seen that COVID-19 is also linked to neurological, psychological, and gastro-intestinal symptoms. There is an ostensible overlap between many disorders linked to tryptophan (TRP) metabolic dysregulation and the clinical manifestation of COVID-19 which may also lead to some speculation about the possible long-term sequelae. Let's summarise what we know from the literature published in the last 18 months about COVID-19 and TRP research and where it will bring us forward.

TRP and KP metabolism dysregulation, a prime target in COVID-19 infection

So far, 15 papers have been published on TRP and kynurenine pathway (KP) dysregulation in people infected with COVID-19. Studies have compared changes in TRP catabolites in (1) COVID-19 positive cases to non-COVID-19 cases and healthy controls; (2) disease severity ranging from mild, moderate, severe, critical and death; (3) positive cases with COVID-19 stratified by inflammation. A wide diversity of sample types used in profiling have been explored, from (mainly) plasma and serum to airway mucus, breastmilk, faecal matter, and urine. In brief, the unifying findings from these studies indicate that the KP is (more) activated (reflected by KYN/TRP ratio) in people with COVID-19 and that this correlates with the severity of infection (e.g. longer intensive care stays). This is not surprising considering the literature is well-established regarding KP activation and immune activity. Several studies have also reported positive correlations between KP metabolites with pro-inflammatory mediators such as interferon gamma and interleukin 6, to name a few. Interestingly, several independent labs have reported in their studies that KYN/TRP ratio is a key predictor of COVID-19 positive cases from healthy control with a high discriminating power (ROC value > 0.9).

Extrinsic and Intrinsic factors involving TRP in COVID-19

Some studies have looked at how microbial TRP metabolism can mediate the relationship between the host's gut microbiome and the severity of a COVID-19 infection. One study has linked environmental pollutants to perturbed immune function and dysregulated KP metabolism, thereby increasing the host's susceptibility to contracting COVID-19. Other studies have identified genetic risk factors linked to TRP-related genes in developing severe COVID-19.

Treatment implications involving TRP in COVID-19

Despite the world's unified effort for a safe and timely vaccination roll out to reduce the spread and severity of COVID-19 infections, there are still on-going cases that require effective treatments to mitigate associated symptoms, especially when new strains (such as the delta and epsilon strains) are on the horizon. Collectively, it seems that the evidence gathered on TRP metabolism so far indicates that it may be a potential target of interest and an opportunity for new therapeutic approaches. One study computationally demonstrated the use of ozone as a prooxidant against the highly sensitive TRP-enriched site of viral protein

in coronavirus. Others demonstrated the efficacy of IDO inhibition in attenuating COVID-19 induced immune responses and showed that higher TRP after treatment with Tocilizumab was linked to more favourable outcomes of recovery.

Where do we go from here?

Clearly, there is strong evidence pointing towards the dysregulation of TRP metabolism in COVID-19 infections. The immediate impact of dysregulated TRP metabolism on psychological and gastrointestinal outcomes are not hard to envisage. Will COVID-19 lead to a permanent change of the host's TRP metabolism that renders them susceptible to cancer or neurodegeneration? These questions are of great interest, especially in the geriatric population. Alternatively, can TRP metabolism be utilised as an effective treatment option to reduce the severity of COVID-19 infections? We have certainly obtained a better understanding of TRP metabolism through this pandemic and ISTRY will be excited to see what TRP research can offer to curb this pandemic and its after-effects.

THE PEOPLE BEHIND ISTRY

Executive Committee Members

President

Prof. Dr. Florian Daniel Zepf conducts his studies on tryptophan metabolism at the Clinic for Child and Adolescent Psychiatry, Psychosomatics and Psychotherapy at the University Hospital Jena, Germany.

Secretary

Dr. Edwin Lim investigates tryptophan metabolism with a specific interest in identifying biomarkers for neurological diseases at Macquarie University, Australia.

Vice President

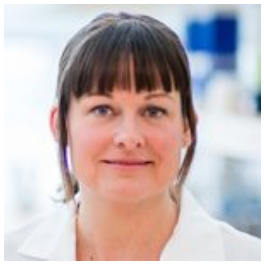
Prof. Dr. Tsutomu Fukuwatari conducts research at The University of Shiga Prefecture in Japan where he studies tryptophan metabolism in many disease states.

Treasurer

Prof. Emeritus Dr. Trevor W Stone is interested in the kynurenine pathway metabolites and the link with neurological disorders with specific interest in brain development. He conducts his research at the University of Oxford and University of Glasgow.

President Elect
Prof. Sophie Erhardt

Past President
Prof. Gilles Guillemin



Member
Prof. Lena Brundin

Member
Dr. Stefano Comal

Media Team

Dr. Amanda Burmeister

Miss Feride Eren

Miss Lorraine Tan

Since the COVID-19 pandemic, the ISTRY Executive Committee understands the importance of being socially connected to ensure the continued success of our society. This has provided opportunity and exposure for a group of vibrant early career researchers (ECRs) to be future leaders in the field to promote ISTRY virtually. In early 2021, the ISTRY media team was formed. Under the direction of the secretary, Dr. Edwin Lim, our team aims to promote ISTRY through social media engagement and revamping the ISTRY website. Our team has worked cohesively to bring you interesting content such as the monthly featured articles and this biannual newsletter.

The ISTRY media team is constantly looking out for talented ECRs and is also interested in taking paper submissions for our monthly articles. If you are interested in joining this dynamic group or would like your recently published paper featured on the ISTRY website, please contact us at media_team@istry.org.

CONTACT US

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