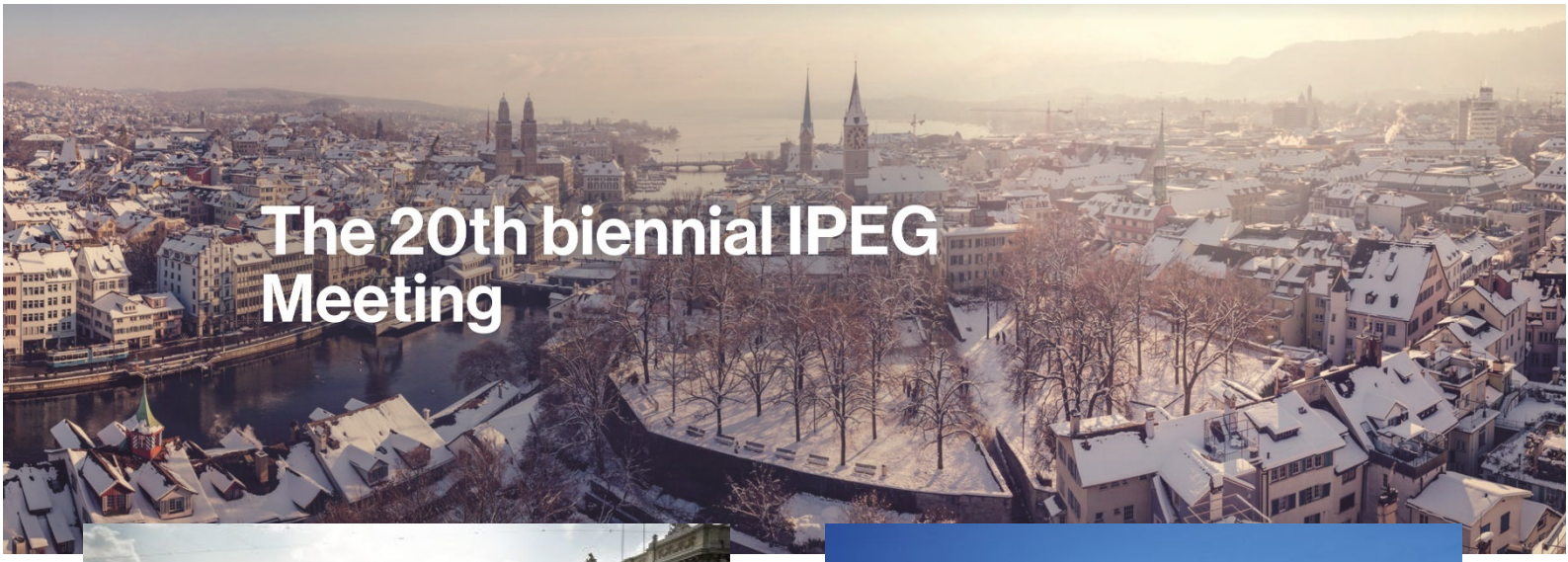
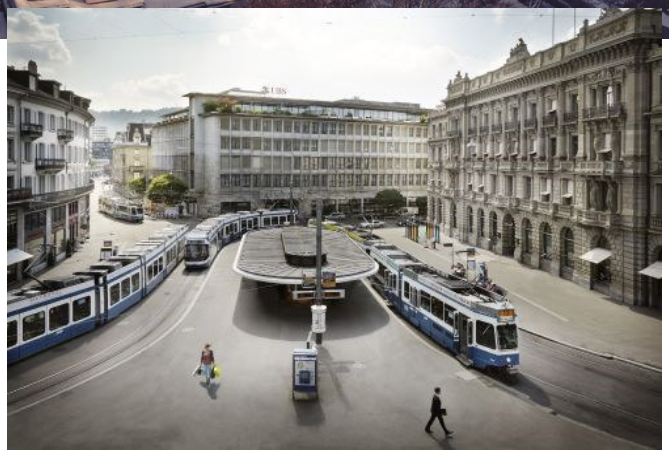
IPEG International Pharmaco-EEG Society
Association for Electrophysiological Brain Research in Preclinical and Clinical Pharmacology and Related Fields

Psychiatrische Universitätsklinik Zürich

Program IPEG Meeting Zurich, Switzerland, November 21st - 25th, 2018





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IPEG International Pharmaco-EEG Society
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The IPEG Meeting from 21st-25th November 2018 at the University Hospital of Psychiatry Zurich, Switzerland

Dear Colleagues, Researchers and Friends

The International Pharmaco-EEG Society (IPEG, http://www.ipeg-society.org) is a professional association for researchers involved in electrophysiological brain research in preclinical and clinical pharmacology, neurotoxicology, personalized medicine and related areas. The IPEG provides a platform for a vivid exchange of experiences, methods and opinions, as well as a place for networking with the community. The upcoming IPEG 2018 conference will allow researchers from all over the world - and from the clinic, academia or industry - to present their latest findings and discuss the progress of electrophysiological research in clinical and preclinical contexts.

We are looking forward to an exciting meeting in Switzerland at the University Hospital of Psychiatry Zurich, in November 2018.

Prof. Dr. Erich Seifritz
Chairman
University Hospital of Psychiatry Zurich
Department of Psychiatry, Psychotherapy and Psychosomatics
Organizer

PD Dr. Sebastian Olbrich
President of the IPEG,
University Hospital of Psychiatry Zurich
Department of Psychiatry, Psychotherapy and Psychosomatics
Organizer

Prof. Dr. Hans Peter-Landolt,
Institute of Pharmacology and Toxicology,
University Zurich,
Scientific Committee

Prof. Dr. sc. nat.Thomas Koenig
Department of Psychiatric Neurophysiology,
University Hospital of Psychiatry, Bern,
Scientific Committee

Dr. Madelon Vollebregt
Secretary of the IPEG,
Brainclinics Research Institute, Nijmegen,
The Netherlands,
Organizer

Dr. Marcel Pawlowski
Treasurer of the IPEG,
Centre of Mental Health,
Klinikum Ingolstadt,
Germany,
Organizer

Additional scientific advice by:

Prof. Dr. Christopher Pryce, Laboratory Head Preclinical Lab for Translational Research, University Hospital of Psychiatry Zurich Department of Psychiatry, Psychotherapy and Psychosomatics

Local Organizing Committee:

Sebastian Olbrich

Erna Silvestri

Tania Villar

Universität Zürich[UZH]

Training Course – Wednesday: November 21st

09:00-09:30 Light Breakfast

09:30-09:45 Introduction

09:45-10:30 Sleep EEG – *Marcel Pawlowski, Ingolstadt, Germany*

10:30-11:15 Practical principles of developing artificial neural networks for EEG data– *Hanneke van Dijk*, *Nijmegen, Netherlands*

11:15-11:45 Coffee Break

11:45-13:15 EEG-Microstates – *Thomas Koenig, Bern, Switzerland*

13:15-14:15 Lunch at "Obstgarten" Restaurant

14:15-15:00 Clinical EEG – *Oliver Pogarell, Munich, Germany*

15:00-15:45 Translational preclinical EEG – *Pim Drinkenburg, Beerse, Belgium*

15:45-16:15 Coffee Break

16:15-17:00 Vigilance Analysis – *Christine Ulke, Leipzig, Germany*

17:00-17:45 LORETA Source Localization – *Sebastian Olbrich, Zurich, Switzerland*

Wednesday evening

18:00-18:15 Presidential address and welcome
Sebastian Olbrich (IPEG President)

18:15-20:00 Welcome reception

Thursday: November 22nd

08:30-09:00 Light Breakfast

09:00-09:15 Welcome address by Prof. Dr. med. Erich Seifritz, Organizer and Director of Department of Psychiatry, Psychotherapy and Psychosomatics, University Hospital of Psychiatry Zurich

09:15-10:00 **Keynote 1: Derk-Jan Dijk, Guildford, UK:**

"What makes a good night's sleep: physiology and pharmacology"

10:00-11:15 **Symposium 1: "Chronobiology and Sleep-Wake Regulation"**

Chair: Hans-Peter Landolt, Zurich, Switzerland

1. "Sleep and circadian rhythm disruption in neuropsychiatric illness: insights from molecular mechanisms that regulate the circadian clock"

   Aarti Jagannath, University of Oxford, Oxford, UK
2. "Caffeine and sleep: chronic caffeine deepens sleep in mice"

   Tom de Boer, Leiden, Netherlands
3. "GHB, sleep and performance: Polysomnographic and MRS studies"

   Dario Dornbierer, Zurich, Switzerland

11:15-11:45 Coffee Break

11:45-13:15 **Symposium 2: "New insights into precision medicine and target engagement in depression treatments"**

Chair: Martijn Arns, Nijmegen, Netherlands

1. "New Insights into Precision Medicine and Target Engagement in Depression Treatments"

   Tabitha Iseger, Nijmegen, Netherlands
2. "Upregulated brain arousal in major depression and unstable brain arousal in ADHD predict response to pharmacotherapy"

   Ulrich Hegerl, Leipzig, Germany

3. "Temporal Development of Depression Biomarkers from the iSPOT-D study: State or Trait"

   Nikita van der Vinne, Nijmegen, Netherlands

4. "Can psychological features predict antidepressant response to rTMS? A Discovery-Replication approach"

   Noralie Krepel, Nijmegen, Netherlands

13:15-14:15 Lunch at "Obstgarten" Restaurant

14:15-15:00 **Keynote 2: Martijn Arns, Nijmegen, Netherlands:**

"EEG Based Personalized Medicine in ADHD and Depression: Dream or reality"

15:00-16:00 **Free Communications 1: Preclinical EEG**

1. "Aberrant Phase-Amplitude Coupling in a Mouse Model of Attention Deficit Hyperactivity Disorder"

   Atul Maheshwari, Baylor College of Medicine, Houston, USA

2. "Development of a visual mismatch negativity task in freely moving mice"

   Renate Kat, Groningen, Netherlands

3. "New Automated Algorithm Controlling for Movement in Pharmaco-Electroencephalographic Experiments in Rats"

   Kjartan Frisch Herrik, Valby, Denmark

16:00-16:30 Coffee Break

16:30-17:45 **Free Communications 2: Electrophysiological Markers for Individualized Medicine**

1. "Resting EEG Measures of Brain Arousal in a Multisite Study of Major Depression"

   Christine Ulke, Leipzig, Germany

2. "Suppression of REM Sleep related Heart Rate Variability by Antidepressants at Week one predicts Treatment Response at Week four"

   Marcel Pawlowski, Ingolstadt, Germany

3. "The value of QEEG prefrontal theta cordance in the prediction of response to various antidepressants"

   Martin Brunovsky, Prague & Klecany, Czech Republic

4. "Atomic Decomposition of Human EEG Oscillations in Medical Research and Pharmaceutical Trials"

   Roman Rospial, Palo Alto, USA & Bratislava, Slovakia

5. "Automatic human sleep stage scoring using Deep Neural Networks"

   Alexander Malafeev, Zurich, Switzerland

Thursday evening

18:00-20:00 **Welcome reception with Morten Keller, Stadt Zurich and Carmen Walker Späh, Kanton Zurich with Apéro**

Friday: November 23rd

08:30-09:00 Light Breakfast

09:00-09:45 **Keynote 3: Franz Vollenweider, Zurich, Switzerland:**

„Phenomenology and neuronal correlates of altered Self: Teachings from Psychedelics“

09:45-11:15 **Symposium 3: “EEG microstate analyses: An update on theoretical, methodological and empirical issues”**

Chair: Thomas König, Bern, Switzerland

1. “EEG microstates and fMRI resting state analysis”

   Thomas König, Bern, Switzerland
2. “Temporal structure of EEG microstates assessed via long-short-term-memory network analysis”

   Hamidreza Jamalabadi, Tübingen, Germany
3. “EEG microstates and pharmacological interventions”

   Bastian Schiller, Freiburg, Germany
4. “EEG microstate and fMRI resting state analysis of ongoing stream of thoughts”

   Christoph M. Michel, Geneva, Switzerland

11:15-11:45 Coffee Break

11:45-12:30 **Keynote 4: Daniel Brandeis, Zurich, Switzerland:**

“The Neurophysiology of ADHD - a translational update on mechanisms, biomarker candidates and treatment”

12:30-14:15 General Assembly

13:15-14:15 Lunch at “Obstgarten” Restaurant

14:15-15:15 **Keynote 5: Nikos Logothetis, Tübingen, Germany:**

“Investigation of Brain function - Where do we come from and where do we go?”

15:15-16:45 **Symposium 4: „EEG-based dissection of Autism Spectrum Disorder for personalized treatment“**

Chair: Klaus Linkenkaer-Hansen, Amsterdam, Netherlands

1. “EEG abnormalities in Autism Spectrum Disorder are associated with paradoxically low excitation-inhibition ratios”

   Erika Juárez-Martínez, Utrecht, Netherlands

2. “Dissection of neurophysiological variability in ASD through auditory event-related potentials”

   Jan Sprengers, Utrecht, Netherlands

3. “Association between local excitation-inhibition ratio and long-range functional connectivity in autism spectrum disorder”

   Simon Houtman, Amsterdam, Netherlands

4. “An EEG-based machine-learning approach for stratifying autism spectrum disorder”

   Sonja Simpraga, Amsterdam, Netherlands

16:45-18:30 **Poster and Drinks**

Posters will be presented in a separate room beneath the meeting hall. While hearing about the latest findings of your colleagues, you may enjoy a glass of wine and have some snacks to enhance your networking abilities.

Saturday: November 24th

08:30-09:00 Light Breakfast

09:00-09:45 **Keynote 6: Jonathan Downar, Toronto, Canada: "Translational advances in therapeutic rTMS: an era of rapid progress"**

09:45-11:15 **Symposium 5: "Translational Research: Psychedelic Drugs"**

Chair: Tomas Palenicek, Prague, Czech Republic

1. "EEG and Psylocibin in humans and animals"
   Tomas Palenicek, Prague, Czech Republic
2. "The effects of psilocybin on sleep architecture"
   Giancarlo Allocca, Melbourne, Australia
3. "Effects of Ayahuasca on human EEG"
   Eduardo Schenberg, Sao Paulo, Brasil
4. "Effects of i.v. DMT on EEG"
   Christopher Timmerman, London, UK
5. "The olfactory bulb is a source of high-frequency oscillations (130–180 Hz) associated with a subanesthetic dose of ketamine in rodents"
   Mark Hunt, York, UK

11:15-11:45 Coffee Break

11:45-13:15 **Symposium 6: "Deep Learning and EEG: new Horizons"**

Chair: Sebastian Olbrich, Zurich, Switzerland

1. "CNNs and LSTMs for EEG analysis in diagnosis and prediction of psychiatric disorders"
   Sebastian Olbrich, Zurich, Switzerland
2. "Deep learning for EEG analysis"
   Tonio Ball, Freiburg, Germany

3. "Deep learning for clinical EEG analysis in neurology"

   Michel van Putten, Enschede, Netherlands

4. "Deep learning applicability in clinical practice; Classifying sex and specific brain activity from the EEG"

   Hanneke van Dijk, Nijmegen, Netherlands

13:15-14:15 Lunch at "Obstgarten" Restaurant

14:15-15:00 **Keynote 7: Nikolai Axmacher, Tübingen, Germany:**

"Oscillatory engram patterns"

15:00-16:30 **Symposium 7: "The use of EEG in animal models for neurological and neuropsychiatric disorders: From translational biomarkers to drug discovery and development"**

Chair: Pim Drinkenburg, Beerse, Belgium

1. "Nonconvulsive epileptic discharges in Alzheimer model mice: Characterization and treatment options"

   Heikki Tanila, Kuopio, Finland

2. "Spectral on-going EEG markers of exploratory movements in mouse models of physiological aging and Alzheimer`s disease"

   Claudio Babiloni, Rome & Cassino, Italy

3. "Behaviour and neurophysiology in the marmoset model for neurological disorders"

   Ingrid H.C.H.M. Philippens, Rijswijk, Netherlands

4. "Translational aspects of EEG-based biomarkers in drug development"

   Geoffrey Viardot, Didenheim, France

16:30-17:30 Coffee Break

17:30-18:30 **Prof. Turan Itil Memorial Grant with speech from Yasmin Itil and prerecorded lecture Dr. Russo, Hawaii, USA**

Prof. Turan Itil Memorial Grant Winner Keynote: "Differences between Parkinson MCI and amnestic MCI in event-related oscillatory responses"

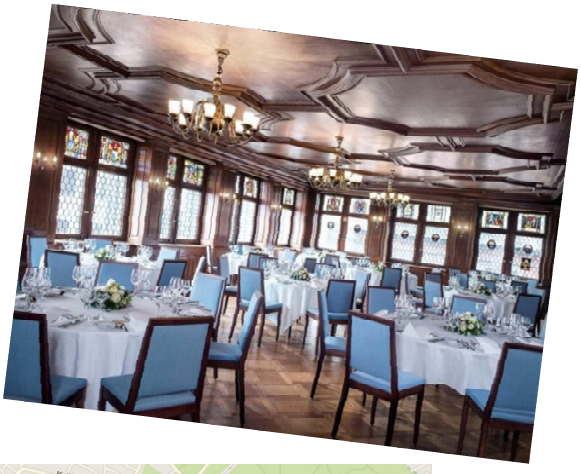
Görsev Yener, Izmir, Turkey

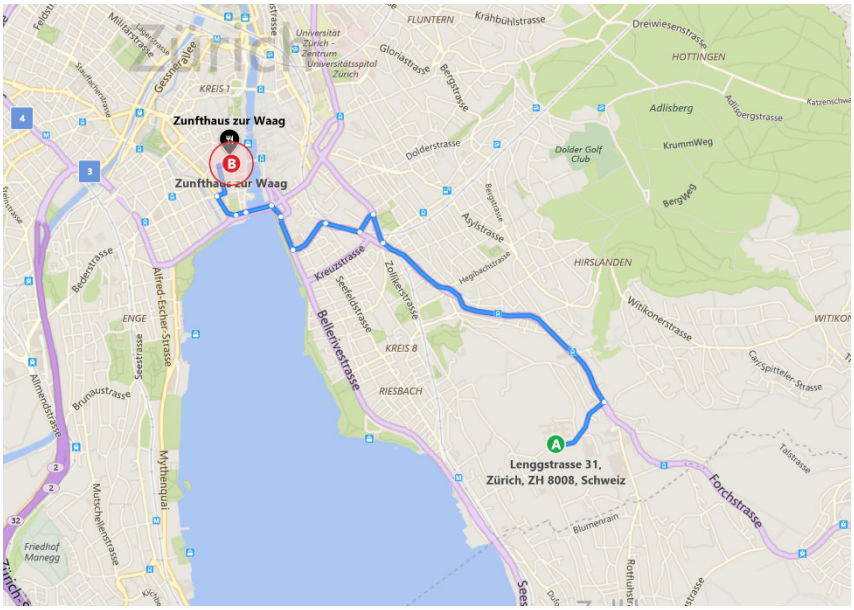
Saturday evening

19:00-22:00 **Social Event: Dinner at the Zunfthaus "Zur Waag"**

Address: Münsterhof 8, 8001 Zürich

Website: http://www.zunfthaus-zur-waag.ch/





Sunday: November 25th

08:30-09:00 Light Breakfast

09:00-10:00 **Free communications 3: EEG-Biomarkers**

1. "A comparison of EEG connectivity outcome measures for Alzheimer's disease in a double-blinded randomized clinical trial of PQ912"

   Casper T. Briels, Amsterdam, Netherlands
2. "EEG/ERP - Biomarker/Neuroalgorithms in adults with ADHD: Development, reliability and application in clinical practice"

   Andreas Müller, Grison, Switzerland
3. "Diversity of motor-cognitive performance in patients treated by STN DBS"

   Martin Lamoš, Brno, Czech Republic

10:00-11:00 **Free communications 4: Event-Related-Potential Research**

1. "A computational trial-by-trial EEG analysis of hierarchical prediction errors"

   Sara Tomiello, Zurich, Switzerland
2. "Hierarchical Prediction Errors during Auditory Mismatch under Pharmacological Manipulations: A Computational Single-Trial EEG Analysis"

   Lilian Weber, Zurich, Switzerland
3. "Machine learning based electrophysiological measures (EEG/ERP) for memory impairment"

   Ziv Peremen, ElMindA Ltd, Israel

11:00-11:15 **Werner Hermann Winner Announcement**

11:15-11:30 **Farewell**

Prof. Dr. med. Werner M. Herrmann (1941-2002) Memorial Grant

Sponsored by PAREXEL International
The sudden passing of Prof. Werner M. Herrmann in May 2002 was a great shock for his friends, colleagues and for everyone who regarded him as a mentor, a sounding board and a sparring partner. Werner Herrmann as at the foremost a passionate, dedicated scientist, whose quest for excellence was enhanced by his curiosity, his initiative and his drive. He has made significant contributions through his innumerable publications and lectures and he was one of the founding members in the development of the IPEG. He also served many years as the Main Editor of NEUROPSYCHOBIOLOGY (section Pharmaco-EEG), the official journal of the IPEG. The Werner Herrmann Memorial Grant has been established by PAREXEL International (PRXL) to encourage research in the field of neuropsychophysiology and to promote the knowledge of recent developments and advanced information of the methodology and applications of neurophysiological research in neuropsychopharmacology. The Grant of €2,000 is offered to the best contribution made by a young researcher at the biennial IPEG Conference. Ceremony will take place at Sunday, 25th November at 11:00 a.m.

Previous Winners

- IPEG Conference - Nijmegen (2016): **Stephanie Thiebes** (Oral presentation): Glutamatergic deficit and negative symptoms: new evidence from the ketamine model of schizophrenia.
- IPEG Conference - Leipzig (2014): **Sonja Simpraga** (Poster): Is EEG biomarker integration the key to personalized medicine? Evidence from zygosity prediction in twins.
- IPEG Conference in New York (2012): **Carina Graversen** (poster): The analgesic effect of morphine is reflected by changes in single-sweep evoked brain potentials
- IPEG Conference in Prague – Czech Republic (2010): **Sebastian Olbrich** (oral presentation): EEG-based assessment of vigilance regulation in major depression and cancer-related fatigue
- IPEG Conference in Rouffach – France (2008): **Tomáš Pálenícek** (poster): Quantitative EEG in glutamatergic and dopaminergic models of psychosis - animal study; **Michael Kometer** (Poster): The 5-HT1A/2A Agonist Psilocybin disrupts modal object completion associated with visual hallucinations.
- IPEG Conference in Awaji – Japan (2006): **Masafumi Yoshimura** (oral presentation): An EEG symptom provocation study in patients with obsessive compulsive disorder; **Akinori Hozumi** (poster): Effects of levodopa on mid-latency auditory evoked potentials in de novo Parkinson's disease; **Martin Brunovsky** (poster): qEEG cordance as a predictor of response to antidepressants in patients with resistant depressive disorder
- IPEG Conference in Antwerp – Belgium (2004): **Brigitte Bouwman** (poster): Distinctive effects of modafinil and d-amphetamine on the homeostatic and circadian regulation of the human waking EEG
- IPEG Conference Barcelona, Pain (2002): **Florian Chapotot** (oral presentation): Distinctive effects of modafinil and d-amphetamine on the homeostatic and circadian regulation of the human waking EEG

Prof. Dr. Turan Itil (1924-2014) Memorial Grant

THE CONTRIBUTIONS OF TURAN ITIL TO PHARMACO-EEG SCIENCE

It was a beautiful Fall day to highlight the splendid art and architecture of Rome. An organizing first meeting of an international psychopharmacology membership, the CINP, opened in September 1958 with 500 attendees. The previous few years had seen the introduction of many new chemical treatments for the mentally ill as the bounty of a newly energized pharmaceutical industry.
I had been studying the EEG effects of induced seizures (ECT, electroshock) when LSD and chlorpromazine were introduced to my hospital. These new agents elicited lesser, more subtle effects on EEG frequencies and amplitudes, with different effects on patient behaviors. I soon had a catalog of different EEG and behaviors that I presented at the meeting as "EEG Effects of Psychopharmacologic Agents."
The next speaker was Turan Itil, a young Turkish scholar from Erlangen, Germany. He opened his presentation with Hans Berger's description of the scalp recorded EEG, then showed records of the effects of amobarbital and chlorpromazine, confirming my descriptions of their EEG and behavior effects. We lunched together and we quickly saw that Turan could use my slides for his presentation, much as I could use his for my presentation. By the end of the meeting, we agreed that there was a useful "association of EEG change that was predictive of the clinical effects of the agents" for both new drugs and electroshock, recognizing the science of pharmaco-EEG.
In 1961, Turan accepted my invitation to join me in New York at Hillside Hospital's Department of Experimental Psychiatry. We were well funded by the NIMH ECDEU program. Our connection was interrupted, however, as in 1962 I was invited to establish the Missouri Institute of Psychiatry in St. Louis. Turan, his wife Ellen and the two children, Kurt and Yasmin joined the Institute in 1964, with Turan as Institute clinician and electroencephalographer.
Turan catalogued the clinical and EEG effects of many psychoactive agents. He developed a methodology to predict the effects on human behaviors from their EEG profiles, identified new agents for industry, and explored the EEG and behavior effects of hormones, cognitive enhancers and stimulants. His predictions for doxepin and mianserin, were central to their widespread usage, and the failure of flutroline to elicit EEG effects supported its rejection from the clinics..
At the Institute, we recognized that page turning and visual estimation of EEG were unreliable, and we developed quantitative digital computer measurements based on the IBM 1800 electronic system. Assisted by the computer scientists at Washington University, and supported by the NIMH, we developed digital computer programs for period and power spectral density analyses that offered reliable quantitative measures of change. After desktop digital computers were introduced, Turan and our colleague Donald Shapiro developed computer programs that are now readily established in all present-day EEG devices.
We became protagonists for the "association of EEG change and human behavior" challenging the laboratory pharmacologists who argued that animal EEG trials were more reliable measures of drug science. At the CINP Washington DC meeting in 1966, the association hypothesis for human studies was established. It offered a testable hypothesis to examine the effects of new treatments on brain functions and behavior in man. (1)
Industrial and laboratory psychopharmacology became enamored of the neurotransmitter theories that reported different enhancements of serotonin, dopamine, epinephrine, and others that were not measurable in humans. These became the basis for the plethora of drugs in today's psychopharmacology. But we were unable to associate EEG patterns for these transmitters, encouraging the discard of EEG studies.
Turan trained Werner Hermann in Berlin, Bernd Saletu in Vienna, Masami Saito in Osaka, and Sevket Akpinar in Ankara in pharmaco-EEG. With Werner Hermann and Walter Sannita, Turan was a founding member of the IPEG. He was a consultant in psychopharmacology for the WHO, and in his later years he established clinics for the quantitative evaluation and development of memory enhancers.
From time to time, the pharmaco-EEG methodology is tested. A new study from Marseilles reports the quantitative EEG effects of six atypical neuroleptic drugs in well monitored patients, each exposed to a single agent. (2) Clozapine elicited measurable EEG and behavior effects, three drugs had minimal EEG effects, and two had none. These weak EEG effects reflect the marginal, placebo benefits of marketed atypical neuroleptics. Similar minimal effects are recorded for the plethora of antidepressant agents that flood the world's pharmacies.(3)
The assessments of psychotropic drug effects in humans are difficult and expensive, requiring cooperation of human volunteers, with the additional ethical hurdles inherent to human studies. By the late

1980s, neither government nor industry supported pharmaco-EEG studies and the predictive science was largely abandoned. Yet, pharmaco-EEG measures offer a quantitative methodology that is safe, repeatable, reliable, and predictive of psychoactive drug effects.
Turan Itil was its dedicated scholar and his humor and enthusiasm is sadly missed. (4)

Max Fink, M.D.
Professor of Psychiatry and Neurology Emeritus, Stony Brook University, New York

[1] Bradley P, Fink M. (Eds.): Anticholinergic Drugs and Brain Functions in Animals and Man, Progress in Brain Research, Vol. 28, Elsevier, Amsterdam, pp. 375, 1965.
[2] Dias Alves M, Micoulaud-Franchi JA, Simon N, Vion-Drury J. Electroencephalogram modifications with atypical strict antipsychotic monotherapies. J Clin Psychopharmacology 2018; 38(6): 555-562.
[3] Fink M. A useful example of pharmaco-electroencephalogram science: Invited commentary on article by Dr. Dias Alves. J Clin Psychopharmacology 2018; 38(6): 552-554.
[4] Fink M. Turan M. Itil. Obituary. Neuropsychopharmacology 2014; 39:3133-3134

Winner Prof. Dr. Turan Itil (1924-2014) Memorial Grant 2018:

Görsev Yener, Izmir, Turkey

Sponsored by Yasmin Itil