

### 1. Eliska

Signalling pathways of estrogens and retinoids, as part of endocrine system, are included in the regulation of many crucial processes controlling functions of immunity, metabolism, development and behavior. Disruption of these signalling systems can lead to serious impacts on living organisms. The presence of anthropogenic endocrine disruptors in the aquatic environment has been intensively studied, but endocrine disruptive compounds can be also of natural origin. The aim of this study was to investigate if cyanobacteria produce estrogen-like and retinoid-like compounds. Various cyanobacterial species were cultivated and their intra- and extra-cellular metabolites were studied. Potencies of the metabolites to activate estrogen and/or retinoid receptors were examined by reporter gene cellular models. The activities of metabolites were compared to the effects of well-described ligands of estrogen and retinoid receptors, that is, 17 $\beta$ -estradiol and all-trans retinoic acid, respectively. The observed effects of intracellular cyanobacterial metabolites reached up to tens of ng estrogen equivalent and thousands of retinoid equivalent per g of dry matter of biomass. Extracellular metabolites showed only the retinoid-like potency, retinoid equivalents were up to thousands ng/L of cultivation volume. This study documents that some cyanobacteria are producers of metabolites with potency to effect estrogen and retinoid signaling systems in vitro. The levels of the observed effects could cause effects to living organisms in water environments and should be considered in a risk assessment, especially during an occurrence of water blooms.

### 2. Marek (Re-thinking of ex ante impact assessment of low emission zones in EU)

Low emission zones (LEZs) are the most implemented transport measures in Europe to decrease the level of air pollution in urban environments. However, evidence of the benefits from their implementation is still not observed. The aim of the paper is to review and critically analyse modeling methods used for ex ante impact assessments of LEZs conducted in the past, when these assessment studies were used as justification for their implementation. The review analyses 12 studies from Germany, France, UK, Sweden, Italy and Denmark whereby the structure, modeling methods and outcomes of the studies are compared to each other. The analysis discerns the systematic overestimation of positive impacts which resulted in an overestimation of the benefits of LEZs, particularly due to inappropriate use of modeling methods. Since the European Commission and national governments are willing to support rapid implementation of LEZs, the paper claims for serious re-thinking of modeling methods commonly used in ex ante impact assessment of LEZs.

### 3. Anna

Sustained over-activation of the Receptor for Advanced Glycation End-products (RAGE) in diabetes is considered to be **one of the** pathways leading to hyperglycemia induced damage and chronic inflammation. **One of the** possible mechanisms responsible for sustained RAGE activation might be promoter DNA methylation induced by high ambient glucose. In a pilot study, we investigated RAGE promoter methylation in normo- and hyperglycemia in vitro (i.e. cell lines corresponding with typical diabetic complications sites) and in vivo (i.e. in non-diabetic vs. poorly controlled diabetics). Embryonic kidney and endothelial cell lines were cultivated in 5 vs. 25 mM/L glucose in culture medium.

Peripheral blood was drawn and mononuclear cells were separated from patients suffering from type 2 diabetes with established diabetic kidney disease and healthy counterparts. Although increased expression of RAGE was found in the embryonic kidney cell line and in the in vivo experiment, no associations between RAGE promoter methylation and its expression were found.

#### **4. Vít**

This study is the first attempt of its kind (?) to examine the validity of the Expressions of Spirituality Inventory (ESI) for use in the Czech context. Data were obtained via an online survey from 222 emerging adults (18-25 years; 82% women), with a background in helping professions. Structural equation modelling revealed reasonably good support for the structural validity of the ESI factor model. In addition, all of the subscales showed relatively high values of internal consistency. However, problems with the measurement of non-invariance in the sample were present as some items correlated with different dimensions, contrary to expectations. These findings are consistent with cross-cultural research on ESI showing that the ESI has structural but not measurement invariance at the item and dimension level. Overall, the results of this study provide support for factorial validity and internal consistency of the ESI in the Czech context.

#### **5. Monika**

Introduction: In ordinary life the handwriting is not using so often than the keyboard typing. This trend is quickly developing and keyboard typing maybe will substitute classical writing with pen and paper.

Aim: The aim of this study is to identify the differences between handwriting with pen and paper and keyboard typing by mapping areas of the brain activated during these processes. Our attention is oriented to the peripheral processes of writing.

Methods, procedures: Functional magnetic resonance imaging (fMRI) was used with 14 healthy volunteers aged between 23–33 years, native Czech speakers, to examine the brain activity involved in writing.

The experimental design of the protocol was divided into three parts: handwriting of words, keyboard typing of words and silent spelling of words contrasted with motor control using pen and keyboard and with control using subvocal naming of alphabet matched to each task.

Conclusion: We found differences between handwriting and keyboard typing in three areas in the brain. In all areas, a stronger activation during keyboard typing task was found. The first area is the occipital lobe which is responsible for visual control. The second area is the parietal lobe – superior parietal lobe and inferior parietal sulcus. These brain parts are associated with planning and performing complex moving sequences. The last activated area is dorsal attention network; a probable explanation of this fact is that handwriting is an overlearned process and during keyboard typing is required more attention.

This paper describes the first resolution of our pilot fMRI study of handwriting and keyboard typing. The findings provide new insight into neural processes involved in handwriting and keyboard typing.

## 6. Miroslava

Protein structures and their interaction with ligands have been the focus of biochemistry and structural biology research for decades. Traditionally, the interaction is represented by a ligand that follows a path (tunnel) from the outer solvent to the active site where it can react. This transportation can be a very lengthy and complex process that is influenced and driven by both geometric and physico-chemical properties of the ligand and the amino acids surrounding the tunnel. When studying this process in molecular dynamics simulations, a proper understanding of ligand behavior inside the tunnel is crucial. Therefore, in this paper, we propose a novel method for the interactive exploration of ligand transportation to the active site. As the path of the ligand is usually very jittered and full of impasses, we introduce a path simplification model that emphasizes the main direction of ligand motion. We also propose a new conceptual representation, namely temporal tunnel, and show its main properties that include description of surrounding amino acids. By interacting with this representation, a user can explore the overall characteristics of the temporal tunnel as well as selected portions of the original ligand movement. This approach could easily guide users to choose simulation frames containing important ligand movements that drive the ligand to the active site. Additionally, our simplified representation decreases the length of the molecular dynamics simulation, which reduces the time spent on this analysis. The proposed method was applied to the simulations captured by the biochemists who also evaluated the method.

## 7. Katerina

Research focused on the process of sharing a **tacit knowledge** between a student teacher and its training teacher. It is the **tacit knowledge** which arose from the process of sharing. **Tacit knowledge** is highly individual, barely expressible, arising from the subjective experience of the individual and reflected in his actions especially when dealing with unexpected situations, and interpreted during self-reflection. The aim of this research is to identify tacit knowledge which student teacher and training teacher share. Sharing between student and training teacher is based on their mutual cooperation and shall be conducted in a model of collaborative apprenticeship. A Trainee teacher approaches his experiential background in accordance with the positive development of the student teacher. Data was collected through in-depth interviews inspired by the method of clean language. The research revealed three categories of tacit knowledge, which have different meanings on the base of student's subjective theory. These categories of tacit knowledge are basically made explicit **by training teacher**. The first category is the tacit knowledge that is part of not only the student's thinking, but manifested in his/her acting. The second **category is a category** that is part of the **student's thinking, where the student** has a positive attitude surrounding this tacit knowledge, although this is not demonstrated in his actions. The third **category is the category** that is in student thinking as well as acting, but the student has an opposite view to this category of tacit knowledge. Each category is demonstrated in the data from the interviews. It is also presented how student teacher acquires teacher's tacit knowledge

in accordance with his/her subjective theory. In conclusion, research revealed that acquired tacit knowledge needs lived experience.

## **8. Petr**

The Banking industry is considerably more regulated, therefore supposedly more limited in its manoeuvre capacity, than other spheres of economy. However, even financial companies nowadays increasingly outsource and offshore their activities. The concept of shared services is a way of internal outsourcing when the destination of relocated activities remains within the organizational structure of a company in the form of a shared services center, but the relationship between this center and the rest of the company has features typical for outsourcing. The research question of this paper is: What are the motivations of the relocation of activities to the shared services center (SSC) and how do the perceptions of these motivations by actors influence the process of relocation?

This paper is based on the first case study carried out in the framework of dissertation research which aims to explore the establishment of two shared services centres in two central European countries by two multinational banks domiciled in Western Europe. The presented case study is based on twenty semi-structured interviews. I argue that the position of the SSC is initially extremely uncertain and instable which constrains the SSC's management to embrace an aggressive strategy in order to strengthen the SSC's position. However, this strategy further reinforces the dynamics of the transfer of activities and leads to other forms of implementation of empowered monitoring and controlling mechanisms experienced not only by the SSC, but also by lower management and employees in the country of origin. On the basis of labour process theory, I conclude that the main reason behind shared services implementation is the management's effort to enhance its control of the labour process. This increase in control is related to the increased intensity of work, increased division of labour and heightened job insecurity.

## **9. Vendula**

Strategic Communication (abbr. StratCom) represents a progressive concept in relation to asymmetric warfare. It has already been acknowledged that the centre of gravity of today's and possible future counterinsurgency operations lies in population-centric approaches. However, the persuasion of the population takes place to a large extent in the non-kinetic, information domain. Military actions are still vital, although but the information activities will be most probably as important or even of greater importance. As StratCom is a rather new concept surrounded by many ambiguities, the primary goal of this paper is to introduce its definitions and outline its boundaries with related concepts (public diplomacy, psychological operations, information operations etc.). Subsequently, the use of strategic communication in the official NATO documents and counterinsurgency operations (ISAF mission) will be described. The paper finally discusses whether the Alliance employed this approach successfully and tries to identify possible limitations. It arrives at the conclusion that the concept has been applied in harmony with the Alliance's counterinsurgency strategy and its comprehensive approach to crisis management. However, it has been adopted at the highest level of the organization only and

furthermore it has not been embraced by all member states. Even though StratCom did address some of the earlier failures and shortcomings of the Alliance in the information sphere, there are some limitations - some of them inherent to the organization's structure itself - which raises doubts about whether successful execution of the strategic communication by NATO is actually feasible.

#### **10. Barbora**

The Arctic is undoubtedly a relevant geopolitical region with a specific environment and shared history, interlinked with clearly defined relations of cooperation and confrontation and the awareness of the growing strategic potential shared by all regional actors. With the end of the Cold War, regional security has become more important. The Copenhagen school develops a theory of regional security complex (RSCT), which constitutes the most comprehensive framework for the analysis of regional security dynamics. Buzan and Wæver distinguish regional security complexes (RSC) around the world, however they haven't included the Arctic or polar territories as such. The aim of this paper is to analyze whether the Arctic region can be defined as a distinct RSC. Moreover, it seeks to establish whether it can be substantiated that authors of the theory left out the Arctic behind without classification as an individual RSC. The major part of the paper analyzes two criteria necessary for the classification of the regional security complex. First, the interconnection of the major securitization and/or desecuritization processes. Second, the condition of fulfilling four variables of the essential structure of the RSC. If the Arctic region in its structure corresponds to the essential structure of the RSC and the main (de)securitization processes show strong consistency, it is possible to classify the Arctic as a regional security complex.

#### **11. Šárka**

In certain legal conditions, psychologists belong to the healthcare workers as well. The role of the psychologist is specific, but not always respected. In the article the differences between psychiatrics and psychologists are discussed. Competence conflict is presented by conclusions of Czech Medical Association and Association of Clinical Psychologists. In terms of Act no. 372/2011 Coll., and Act no. 96/2004 Coll., these distinguished between clinical psychologist and psychologist in health. If a psychologist is entitled to employment as a healthcare worker, s/he has to respect ethical principles as well as *lege artis* principles. This article conceives cross-sectoral overlap in psychology and ethics.