THE SCIENCE OF PAIN

AND ITS

MANAGEMENT 2016

ABSTRACTS

6th - 8th December 2016
Location: Online

EuroSciCon

This event will discuss emerging research relating to the physiology, psychology and pharmacology of pain, and its assessment and management.

This event has CPD accreditation

www.lifescienceevents.com/pain2016

#PainESC

The abstract book will be finalised two weeks before the event

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Invited Speakers Abstracts

Gonadal Hormones and Pain

Professor Anna Maria Aloisi, Università degli Studi di Siena, Siena, Italy

The role of gonadal hormones has quickly attracted attention in the study of chronic pain mechanisms. The clear presence of sex differences in chronic pain and the number of studies showing the power of gonadal hormones to modify pain-induced behavioral responses appear to have convinced clinicians and researchers about the possibility of greatly increasing the knowledge of pain mechanisms and thus treatments, thereby increasing studies on gonadal hormones.

Role of 6TM-mOR and GPCR heterodimerization in opioid induced hyperalgesia

Dr. Marino Convertino, University of North Carolina, United States

Opioids are the most prescribed and effective drugs for treatment of moderate and severe pain. They act as agonists towards μ-opioid receptor (mOR), a G Protein-Coupled Receptor (GPCR) that mediates the perception of noxious stimuli at the level of the central nervous system.1 Despite their pharmacological efficacy, the use of opioids in therapy is compromised by the onset of severe side effects, the most important one being the opioid-induced hyperalgesia (OIH). A recently discovered six trans-membrane-helices variant of mOR (6TM-mOR) is directly involved in the generation of an excitatory cellular response, leading to the onset of OIH. Moreover, evidence of the involvement of β2 adrenergic receptor (b2AR) in mediating opioid-dependent side effects have been reported in literature. Our main aim is to understand and describe, at the molecular level, the role and function of 6TM-mOR and b2AR in the development of OIH. We have performed protein-protein docking calculations, as well as classical and discrete molecular dynamics simulations to investigate structural and dynamical features of mOR isoforms, upon binding of morphine. We have used MedusaDock, our in-house developed docking algorithm simultaneously accounting for ligand and receptor flexibility, to generate structural models of the morphine-bound GPCRs. Biochemical assay, immunofluorescence microscopy and site-directed mutagenesis experiments have been adopted to validate our computational findings. We have collected solid evidence demonstrating that 6TM-mOR is able to heterodimerize with β2 adrenergic receptor (b2AR), upon chronic exposure to membrane-permeable opioids. We have further observed that the newly formed 6TM-mOR/b2AR heterodimer migrates to the cell surface and, in response to binding of b2AR to agonist, undergoes agonist–induced internalization. Finally, we have demonstrated that morphine-dependent 6TM-mOR/b2AR activation leads to stimulation of intracellular signaling pathways and activates an excitatory cellular response, ultimately leading to the development of OIH.

Inpatient headache managament for migraines and chronic daily headaches

Dr. Priyanka Chaudhry, Baylor Comprehensive Headache Center, Dallas, United States

Develop individualized treatment plan for migraine patients.
Identify the side effects and complications of most commonly
used inpatient headache medications.
Recognize the importance of non-pharmacological approach
to inpatient headache treatment.

Adapting the Cancer Pain Management Paradigm to Non-cancer Pain and Survivorship

Dr. Pippa Hawley, BC Cancer Agency, Vancouver, Canada

Current advances in oncology treatments have led to higher rates of cure of cancer, and longer survival for those who are not cured. Opioids are highly effective for cancer pain management, but there is good evidence that in the long-term chronic pain management setting the issues of tolerance and opioid misuse/diversion make opioids relatively contraindicated. In this presentation I will discuss the need to reconcle these conflicting approaches, and present some practical tips for pain management in those living for a long time with the consequences of cancer or its treatment.

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Decreasing Tumor Necrosis Factor-alpha Solely in the Brain for Treatment of Neuropathic Pain

Professor Tracey A. Ignatowski, University at Buffalo, Buffalo, United States

Neuropathic pain (NP), chronic pain from nervous system injury, is a major health problem lacking effective treatment. A key cytokine mediator of NP pathogenesis is tumor necrosis factor-alpha (TNF). We found TNF levels increase during NP development, at the injury site and supra-spinally. Our data indicate that NP originating from peripheral nerve injury or diabetes arises from maladaptive brain changes instigated by increased TNF production in the brain. We also show specific enhancement of brain TNF alone produces peripheral hypersensitivity. Since TNF has profound effects throughout the body, current work is focused on specific blockade of brain TNF for therapy.

Where does the pain come from in osteoarthritis?

Professor Graeme Jones, University of Tasmania, Hobart TAS, Australia

This talk will review the evidence regarding pain in osteoarthritis and the implications for therapy

Gentian Violet: A Potential Treatment For Cutaneous Leishmaniasis

Dr Marc Karam, University of Balamand, Biology Department, Kourah, Lebanon

Cutaneous leishmaniasis is considered as a major endemic disease in many countries. Organic antimony compounds known to be the most efficient treatment currently available are associated with cardiac toxicity and require careful monitoring. Thus, an inexpensive and safe drug is urgently needed.

Gentian Violet which is a triphenylmethane derivative, showed a remarkable in vitro and in vivo efficacy against parasites causing cutaneous leishmaniasis.

In this study, we aim to investigate the efficiency of three different doses of Gentian Violet (1.25, 2.5 and 5 mg/kg) given through intra-peritoneal injections on L. major infected BALB/c mice as to hyperalgesia as well as the levels of several cytokines known to be involved in cutaneous leishmaniasis such as IFNγ, TNFα, IL-4, IL-10 and IL-17.

Interestingly, 2.5 mg/kg of Gentian Violet was the most efficient dose in reversing L. major-induced hyperalgesia. On the other hand, IL-4 and IL-10 levels were significantly decreased suggesting that Th2/Treg responses, which normally lead to the susceptibility profile, was impaired by Gentian Violet treatment. In contrast, Th1 response, which is highly associated with resistance against the disease was not affected since IFN-γ secretion was not significantly modified. Furthermore, the pro-inflammatory cytokines TNF-α (known to induce resistance) and IL-17 levels were not significantly affected.

In conclusion, our results open the horizon to new anti-leishmanial drugs which are more efficient and have less side effects than those currently used.

Physical pain threshold and tolerance in self-harm: methodological challenges and future directions

Dr. Olivia J. Kirtley, University of Glasgow, Glasgow, United Kingdom

Research suggests that individuals who have engaged in self-harm have a higher threshold and tolerance for physical pain than those who have never self-harmed. Findings have not always been consistent, however, and whether or not altered pain tolerance within these populations is a cause or a consequence of self-harm is as yet unknown. Research in this area presents significant methodological challenges, both in terms of experimentally inducing pain and assessing pain outcomes. This talk will discuss extant research in the field of pain and self-harm, along with the methodological challenges faced in experimental work of this kind.

Assessment and management of pain in OA patients for hip or knee replacement surgery

Dr. Mogens Berg Laursen, Aalborg University Hospital, Aalborg, Denmark

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The roles of Clathrin Heavy Chain-22 in human pain and touch development

Dr. Mike Nahorski, University of Cambridge, Cambridge, United Kingdom

A congenital inability to feel pain occurs very rarely, however the identification of causative genes has yielded novel targets for pain treatment. We report a novel recessive disorder characterised by congenital insensitivity to pain, inability to feel touch, and moderate mental retardation. Affected individuals harboured a homozygous missense mutation in CLTCL1 encoding the CHC22 clathrin heavy chain. Using quantitative proteomics to investigate the function of CHC22 in neurons, we report the proteins sorted by CHC22 in neuronal cells. Our results reveal an essential and non-redundant role for CHC22 in neural crest development and the genesis of pain/touch sensing neurons.

The use of animal models to elucidate the pathophysiology of "dysfunctional pain", an unexplained and formidable pain category

Dr. Yukinori Nagakura, Aomori University, Aomori, Japan

This presentation would like to attract researcher's attention to "dysfunctional pain, i.e., fibromyalgia, irritable bowel syndrome, interstitial cystitis, etc.", an unexplained pain category emerging as a big issue in terms of medication and social security cost. In particular, it will be focused on the utility of animal models specific to dysfunctional pain (not inflammatory or neuropathic pain) because they are indispensable in exploring relevant pathophysiology and preclinical assessment of new therapies. It will be also discussed what research strategies are possible and effective in developing better therapies.

Phantom limb pain in lower limb amputees: a discussion of the potential mechanisms

Dr. Cliff Richardson, University of Manchester, Manchester, United Kingdom

Following amputation of parts of the body, changes occur in the brain. These cortical reorganisations are implicated in the development of phantom phenomena such as phantom limb pain, phantom awareness and phantom sensations. Much of the research into the mechanisms of phantom limb pain has been undertaken on upper limb amputees but the principles have been applied widely to lower limb amputees as well. This talk will discuss the current thinking in relation to the mechanisms causing phantom limb pain and associated phantom phenomena and reflect upon recent studies which challenge the cortical reorganisation theory

Thinking outside of the joint: The role of the brain in osteoarthritic pain and stiffness

Dr. Tasha Stanton, The University of South Australia, School of Health Science, Adelaide, Australia

This talk will discuss the evidence for perceptual dysfunction in osteoarthritis and will provide new data suggesting that targeting the brain, via multisensory visual, tactile and auditory illusions, may impact symptoms of pain and stiffness in people with osteoarthritis.

New trends in pharmacology of pain

Dr Ferenc Zádor, Hungarian Academy of Sciences, Szeged, Hungary

The introduction of the 14-O-methyl group to morphine derivatives such as morphine-6-O-sulfate and oxymorphone greatly improves their analgesic effect and opioid receptor binding properties. In this talk I will present the biological evaluation of the newly developed 14-O-methylmorphine (14-MeM) in in vitro biochemical and biological assays and in in vivo antinociceptive tests. According to our results 14-MeM displayed a higher agonist efficacy, affinity and selectivity for mu opioid receptor compared to morphine and morphine-6-sulfate.

Oral Presentation Abstracts

Oral presentations will be added after the submission deadline

Day 1:

Day 2:

Day 3:

Poster Presentation Abstracts

Poster abstracts will be finalised weeks before the event

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