Making the otolith magnesium chemical calendar-clock tick: Plausible Mechanism and Empirical Evidence

The incorporation of a number of readily measured trace elements into otoliths is considered to be under some sort of physiological control, but rarely are explicit mechanisms proposed. Studies of the incorporation of the trace element magnesium reveal that in some taxa there exists strong seasonal patterning, taking on the characteristics of a “chemical calendar-clock.” However, Mg/Ca and the isotopic ratio $^{26}$Mg/$^{24}$Mg are less “clock-like” in taxa that are not as metabolically active. Herein, it is hypothesized that Mg uptake and incorporation are related to metabolic activity. Further, a two-step process of Mg incorporation is proposed: (1) limited entry into the otolith-bearing chamber through ion channels and (2) association with water-soluble proteins within the chamber. Supporting data from a range of taxa and life histories are provided; the authors’ aim is to stimulate discussion and encourage physiologists to test these and alternative mechanistic hypotheses.

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Oceans and Arctic, SUNY Albany, Swedish University of Agricultural Sciences, NOAA, Technical University of Denmark
Authors: Limburg, K. E. (Ekstern), Wuenschel, M. J. (Ekstern), Hüsey, K. (Intern), Heimbrand, Y. (Ekstern), Samson, M. (Ekstern)
Pages: 479-493
Publication date: 2 Oct 2018
Main Research Area: Technical/natural sciences

Publication information
Journal: Reviews in Fisheries Science and Aquaculture
Volume: 26
Issue number: 4
ISSN (Print): 2330-8249
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Web of Science (2018): Indexed yes
Scopus rating (2017): CiteScore 3.83
Web of Science (2017): Impact factor 4.75
Web of Science (2017): Indexed yes
Scopus rating (2016): CiteScore 2.23
Web of Science (2016): Impact factor 2.545
Scopus rating (2015): CiteScore 1.1
Web of Science (2015): Impact factor 1.143
Web of Science (2014): Impact factor
Original language: English
chemical calendar-clock, conceptual model, metabolic proxy, mg incorporation, Otolith Mg/Ca
DOIs: 10.1080/23308249.2018.1458817
Source: Scopus
Source-ID: 85047905767
Publication: Research - peer-review > Review – Annual report year: 2018

Occupant response to different correlated colour temperatures of white LED lighting
Correlated Colour Temperature (CCT) of lighting may affect not only occupant visual perception, but also other indoor environment perceptions, such as perceptions of the thermal environment or the air quality. This study aimed at quantifying the association between CCT of white LED lighting and subjective perceptions and performance at operative temperatures at the upper and lower borders and in the middle of the comfort range. Higher CCT was significantly associated with decreasing thermal sensation, but only at the thermally neutral condition. Female subjects responded stronger to changes in CCT than male subjects. Under all temperature conditions, CCT was clearly associated with the perceived brightness of the light, and at 22 °C also with the perceived air quality and with subjectively assessed alertness. CCT had no effect on the measured performance of a d2 task. At 22 °C, the observed decrease in thermal sensation when CCT went from 2700 K to 6200 K was equivalent to a difference in operative temperature of 1.7 °C. With an assumed neutral CCT of 4500 K (middle of range), a decreased heating set point in an office building, corresponding to an equivalent shift in CCT from 4500 K to 2700 K, resulted in a reduction of around 8% of the building’s total annual energy use. However, this assumes ideal conditions without influence from daylight, light from PC monitors, or coloured surfaces and other potentially disturbing factors.

General information
State: Published
Organisations: Department of Civil Engineering, Indoor Environment, Department of Photonics Engineering, Technical University of Denmark, Diode Lasers and LED Systems, Aalborg University
The uptake and diffusion of solar power in Africa: Socio-cultural and political insights on a rapidly emerging socio-technical transition

This special issue focuses on the now rapidly growing solar photovoltaics markets across various geographies and scales in Africa. Herein we summarise the contributions of the component papers and position them within the context of the sustainable energy access literature. We argue that there is an urgent need for greater attention to the neglected socio-cultural and political dimensions of sustainable energy access, dimensions that are vital to understand if ambitious global commitments to sustainable energy for all by 2030 are to be achieved. Included in this special issue are papers on the systemic and socio-technical nature of energy access transitions; their politics and political economy; gendered dimensions; critiques of their technologically determinist framing and the implications for marginalising local actors; and, perhaps for the first time in the energy access literature, application of social practice perspectives to the energy access challenge. The result is a diverse range of empirically-grounded, theoretically and methodologically novel approaches, providing new insights into and understandings of the neglected socio-cultural and political dimensions of sustainable energy access.

General information
State: Published
Organisations: Department of Management Engineering, UNEP DTU Partnership, University of Sussex
Authors: Ockwell, D. (Ekstern), Byrne, R. (Ekstern), Hansen, U. E. (Intern), Haselip, J. (Intern), Nygaard, I. (Intern)
Pages: 122-129
Publication date: 1 Oct 2018
Main Research Area: Technical/natural sciences

Publication information
Journal: Energy Research and Social Science
Volume: 44
ISSN (Print): 2214-6296
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 4.89 SJR 2.063 SNIP 1.692
Web of Science (2017): Impact factor 3.815
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 5.14 SJR 1.845 SNIP 2.025
Hvidvaskning med rejsekort

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science, Dynamical Systems, Statistics and Data Analysis
Authors: Hedlund, F. H. (Intern)
Pages: 15 - 1, sektion
Publication date: 28 Sep 2018

Publication information
Pages (from-to): 15 - 1, sektion
Newspaper: Weekendavisen
No.: 39
Ratings:
ISI indexed (2013): ISI indexed no
ISI indexed (2012): ISI indexed no
ISI indexed (2011): ISI indexed no
Main Research Area: Technical/natural sciences
Electronic versions:
Hvidvask.pdf
Source: PublicationPreSubmission
Source-ID: 154488107
Publication: Communication › Comment/debate – Annual report year: 2018

Multi-stage generation of extreme ultraviolet dispersive waves by tapering gas-filled hollow-core anti-resonant fibers
In this work, we numerically investigate an experimentally feasible design of a tapered Ne-filled hollow-core anti-resonant fiber and we report multi-stage generation of dispersive waves (DWs) in the range 90-120 nm, well into the extreme ultraviolet (UV) region. The simulations assume a 800 nm pump pulse with 30 fs 10 µJ pulse energy, launched into a 9 bar Ne-filled fiber with a 34 µm initial core diameter that is then tapered to a 10 µm core diameter. The simulations were performed using a new model that provides a realistic description of both loss and dispersion of the resonant and anti-resonant spectral bands of the fiber, and also importantly includes the material loss of silica in the UV. We show that by first generating solitons that emit DWs in the far-UV region in the pre-taper section, optimization of the following taper structure can allow re-collision with the solitons and further up-conversion of the far-UV DWs to the extreme-UV with energies up to 190 nJ in the 90-120 nm range. This process provides a new way to generate light in the extreme-UV spectral range using relatively low gas pressure.

General information
State: Published
Organisations: Department of Photonics Engineering, Fiber Sensors and Supercontinuum Generation, Plasmonics and Metamaterials, Ultrafast Infrared and Terahertz Science, University of Central Florida
Authors: Selim Habib, M. D. (Intern), Markos, C. (Intern), Enrique Antonio-Lopez, J. (Ekstern), Correa, R. A. (Ekstern), Bang, O. (Intern), Bache, M. (Intern)
Pages: 24357-24371
Complementary analyses of aging in a commercial LiFePO$_4$/graphite 26650 cell
In this work we investigate the electrode degradation mechanisms in a commercial 2.5 Ah LiFePO$_4$/graphite 26650 cylindrical cell. Aged and fresh electrode samples were prepared by cycling two cells respectively five and 22 k times. Subsequently the cells were disassembled in a glovebox and the electrode samples were prepared for electrochemical testing in a 3-electrode setup, and for characterization with XRD, XPS and low-kV FIB/SEM tomography. A 1 μm thick CEI (cathode electrolyte interface) layer was observed at the electrode/electrolyte interface of the aged LiFePO$_4$ electrode. Relative to the fresh LiFePO$_4$ electrode, the aged electrode exhibited a larger series resistance which indicates the observed degradation layer increases the ionic resistance. In addition, micron-sized agglomerates, probably a mixture of carbonaceous material and decomposition products from the electrolyte, were observed at the electrode/electrolyte interface of the aged graphite electrode. These layers may contribute significantly to the loss of lithium inventory (LLI) in the cell, and to the loss of active material (LAM) in the graphite electrode. Low-voltage FIB/SEM tomography was used to detect local charging effects of graphite particles in the carbon electrode, an effect of poor dissipation of the electric charge to the ground after the sample interaction with the electron beam. The charging effects were primarily observed in the aged electrode and most of the locally charged particles were found to be close to the electrode/electrolyte interface, indicating a poorly percolating graphite network near this interface.

General information
State: Published
Organisations: Department of Energy Conversion and Storage, Imaging and Structural Analysis, Electrochemical Materials and Interfaces, Applied Electrochemistry, Aalborg University, Uppsala University
Pages: 454-468
Publication date: 10 Sep 2018
Main Research Area: Technical/natural sciences

Publication information
Journal: Electrochimica Acta
Volume: 284
ISSN (Print): 0013-4686
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 5.01 SJR 1.439 SNIP 1.101
Web of Science (2017): Impact factor 5.116
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 4.74 SJR 1.355 SNIP 1.177
Web of Science (2016): Impact factor 4.798
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.321 SNIP 1.324 CiteScore 4.86
Web of Science (2015): Impact factor 4.803
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.378 SNIP 1.456 CiteScore 4.59
Web of Science (2014): Impact factor 4.504
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.427 SNIP 1.587 CiteScore 4.44
Web of Science (2013): Impact factor 4.086
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.644 SNIP 1.574 CiteScore 3.99
Web of Science (2012): Impact factor 3.777
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.615 SNIP 1.788 CiteScore 4.15
Web of Science (2011): Impact factor 3.832
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.685 SNIP 1.715
Web of Science (2010): Impact factor 3.65
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.523 SNIP 1.615
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.524 SNIP 1.458
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.551 SNIP 1.568
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.531 SNIP 1.726
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.484 SNIP 1.516
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 1.362 SNIP 1.567
Scopus rating (2003): SJR 1.637 SNIP 1.505
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 1.534 SNIP 1.441
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 1.312 SNIP 1.376
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 0.889 SNIP 1.161
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 0.936 SNIP 1.183

Original language: English
The role of outer membrane proteins and lipopolysaccharides for the sensitivity of Escherichia coli to antimicrobial peptides

Bacterial resistance to classical antibiotics is emerging worldwide. The number of infections caused by multidrug resistant bacteria is increasing and becoming a serious threat for human health globally. In particular, Gram-negative pathogens including multidrug resistant Escherichia coli are of serious concern being resistant to the currently available antibiotics. All Gram-negative bacteria are enclosed by an outer membrane which acts as an additional protection barrier preventing the entry of toxic compounds including antibiotics and antimicrobial peptides (AMPs). In this study we report that the outer membrane component lipopolysaccharide (LPS) plays a crucial role for the antimicrobial susceptibility of E. coli BW25113 against the cationic AMPs Cap18, Cap11, Cap11-1-18m2, melittin, indolicidin, cecropin P1, cecropin B, and the polypeptide antibiotic colistin, whereas the outer membrane protease OmpT and the lipoprotein Lpp only play a minor role for the susceptibility against cationic AMPs. Increased susceptibility toward cationic AMPs was found for LPS deficient mutants of E. coli BW25113 harboring deletions in any of the genes required for the inner part of core-oligosaccharide of the LPS, waaC, waaE, waaF, yaaG, and gmhA. In addition, our study demonstrates that the antimicrobial activity of Cap18, Cap11, Cap11-1-18m2, cecropin B, and cecropin P1 is not only dependent on the inner part of the core oligosaccharide, but also on the outer part and its sugar composition. Finally, we demonstrated that the antimicrobial activity of selected Cap18 derivatives harboring amino acid substitutions in the hydrophobic interface, are non-active against wild-type E. coli ATCC29522. By deleting waaC, waaE, waaF, or waaG the antimicrobial activity of the non-active derivatives can be partially or fully restored, suggesting a very close interplay between the LPS core oligosaccharide and the specific Cap18 derivative. Summarizing, this study implicates that the nature of the outer membrane component LPS has a big impact on the antimicrobial activity of cationic AMPs against E. coli. In particular, the inner as well as the outer part of the core oligosaccharide are important elements determining the antimicrobial susceptibility of E. coli against cationic AMPs.
A conceptual framework for developing the next generation of Marine OBservatories (MOBs) for science and society

In the field of ocean observing, the term of "observatory" is often used without a unique meaning. A clear and unified definition of observatory is needed in order to facilitate the communication in a multidisciplinary community, to capitalize on future technological innovations and to support the observatory design based on societal needs. In this paper, we present a general framework to define the next generation Marine OBservatory (MOB), its capabilities and functionalities in an operational context. The MOB consists of four interconnected components or "gears" (observation infrastructure, cyberinfrastructure, support capacity, and knowledge generation engine) that are constantly and adaptively interacting with each other. Therefore, a MOB is a complex infrastructure focused on a specific geographic area with the primary scope to generate knowledge via data synthesis and thereby addressing scientific, societal, or economic challenges. Long-term sustainability is a key MOB feature that should be guaranteed through an appropriate governance. MOBs should be open to innovations and good practices to reduce operational costs and to allow their development in quality and quantity. A deeper biological understanding of the marine ecosystem should be reached with the proliferation of MOBs, thus contributing to effective conservation of ecosystems and management of human activities in the oceans. We provide an actionable model for the upgrade and development of sustained marine observatories producing knowledge to support science-based economic and societal decisions.

General information
State: Published
Organisations: National Institute of Aquatic Resources, Technical University of Denmark, Section for Oceans and Arctic, National Institute of Oceanography and Applied Geophysics, Stazione Zoologica Anton Dohrn Napoli, Hellenic Centre for Marine Research, National Oceanography Centre, University of Bremen
Authors: Crise, A. (Ekstern), d'Alcalà, M. R. (Ekstern), Mariani, P. (Intern), Petihakis, G. (Ekstern), Robidart, J. (Ekstern), Iudicone, D. (Ekstern), Bachmayer, R. (Ekstern), Malfatti, F. (Ekstern)
Publication date: 7 Sep 2018
Main Research Area: Technical/natural sciences

Publication information
Journal: Frontiers in Marine Science
Volume: 5
Issue number: SEP
Article number: 318
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 2.89 SJR 1.225 SNIP 0.862
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 0.53 SJR 1.425 SNIP 1.095
Clinically-Relevant Rapamycin Treatment Regimens Enhance CD8⁺ Effector Memory T Cell Function In The Skin and Allow their Infiltration into Cutaneous Squamous Cell Carcinoma

Patients receiving immunosuppressive drugs to prevent organ transplant rejection exhibit a greatly increased risk of developing cutaneous squamous cell carcinoma (SCC). However, not all immunosuppressive drugs confer the same risk. Randomised, controlled trials demonstrate that switching renal transplant recipients receiving calcineurin inhibitor-based therapies to mammalian target of rapamycin (mTOR) inhibitors results in a reduced incidence of de novo SCC formation, and can even result in the regression of pre-existing premalignant lesions. However, the contribution played by residual immune function in this setting is unclear. We examined the hypotheses that mTOR inhibitors promote the enhanced differentiation and function of CD8⁺ memory T cells in the skin. Here, we demonstrate that the long-term oral administration of rapamycin to achieve clinically-relevant whole blood drug target thresholds, creates a "low rapamycin dose" environment in the skin. While both rapamycin and the calcineurin inhibitor tacrolimus elongated the survival of OVA-expressing skin grafts, and inhibited short-term antigen-specific CD8⁺ T cell responses, rapamycin but not tacrolimus permitted the statistically significant infiltration of CD8⁺ effector memory T cells into UV-induced SCC lesions. Furthermore, rapamycin uniquely enhanced the number and function of CD8⁺ effector and central memory T cells in a model of long-term contact hypersensitivity provided that rapamycin was present during the antigen sensitization phase. Thus, our findings suggest that patients switched to mTOR inhibitor regimens likely experience enhanced CD8⁺ memory T cell function to new antigen-challenges in their skin, which could contribute to their lower risk of de novo SCC formation and regression of pre-existing premalignant lesions.

General information
State: Published
Organisations: National Veterinary Institute, T-cells & Cancer, Princess Alexandra Hospital Brisbane, University of Queensland
Authors: Jung, J. W. (Ekstern), Veitch, M. (Ekstern), Bridge, J. A. (Ekstern), Overgaard, N. H. (Intern), Cruz, J. L. (Ekstern), Linedale, R. (Ekstern), Franklin, M. E. (Ekstern), Saunders, N. A. (Ekstern), Simpson, F. (Ekstern), Frazer, I. H. (Ekstern), Steptoe, R. J. (Ekstern), Wells, J. W. (Ekstern)
Number of pages: 17
Publication date: 2 Sep 2018
Main Research Area: Technical/natural sciences

Publication information
Journal: OncoImmunology
Volume: 7
Issue number: 9
Article number: e1479627
ISSN (Print): 2162-4011
Ratings:
Web of Science (2018): Indexed yes
Scopus rating (2017): CiteScore 3.96 SJR 1.77 SNIP 0.662
Web of Science (2017): Impact factor 5.503
Web of Science (2017): Indexed yes
Scopus rating (2016): SJR 1.471 SNIP 0.597 CiteScore 3.09
Web of Science (2016): Impact factor 7.719
Scopus rating (2015): SJR 1.504 SNIP 0.597 CiteScore 2.83
Web of Science (2015): Impact factor 7.644
Role of the Raman gain in the noise dynamics of all-normal dispersion silica fiber supercontinuum generation

We theoretically and numerically study the influence of the Raman gain profile on the noise dynamics of the supercontinuum (SC) generation in a standard all-normal dispersion silica fiber using the scalar generalized nonlinear Schrödinger equation. In particular, we investigate the effect of the different secondary resonance gain peaks on the evolution of the SC coherence by comparing the coherence obtained when using the measured Raman gain of silica with that obtained using different analytical approximations. We demonstrate that the strongest secondary peak at 14.8 THz has a significant influence in that it leads to an early development of a decoherence band on the long wavelength side of the SC. In contrast, the decoherence is strongly dominated by the short wavelength side below the pump for all analytical models not taking this 14.8 THz gain peak into account. We demonstrate that this is due to the 14.8 THz peak being spectrally much narrower than the other gain peaks.

General information
State: Published
Organisations: Department of Photonics Engineering, Fiber Sensors and Supercontinuum Generation
Authors: Gonzalo, I. B. (Intern), Bang, O. (Intern)
Pages: 2102-2110
Publication date: 1 Sep 2018
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of the Optical Society of America B: Optical Physics
Volume: 35
Issue number: 9
ISSN (Print): 0740-3224
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 1.97 SJR 0.859 SNIP 0.875
Web of Science (2017): Impact factor 2.048
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.81 SJR 0.85 SNIP 0.936
Web of Science (2016): Impact factor 1.843
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.963 SNIP 0.923 CiteScore 1.78
Web of Science (2015): Impact factor 1.731
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.167 SNIP 1.137 CiteScore 2.09
Web of Science (2014): Impact factor 1.97
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.348 SNIP 1.286 CiteScore 2.33
Erratum to: Genome-wide association and HLA fine-mapping studies identify risk loci and genetic pathways underlying allergic rhinitis (Nature Genetics, (2018), 50, 8, (1072-1080), 10.1038/s41588-018-0157-1)

In the version of this article initially published, in Fig. 3, the y-axis numbering did not match the log scale indicated in the axis label. The error has been corrected in the HTML and PDF version of the article.

General information
State: Published
Organisations: Department of Bio and Health Informatics, National Veterinary Institute, Immunoinformatics and Machine Learning, Department of Mechanical Engineering, Department of Applied Engineering Design and Production, University
Experimental investigation on ultimate strength and failure response of composite box beams used in wind turbine blades

This study focuses on the ultimate strength and failure response of composite box beams under three-point bending. The box beams consist of spar caps and shear webs and they are typically used in wind turbine blades as load-carrying
members. Different spar cap configurations and loading directions are examined experimentally to investigate structural behavior associated with multiple nonlinearities leading to structural collapse. Global displacements, local strains and video images are recorded throughout the loading history to capture failure initiation, propagation and the strain state contributing to post-collapse characteristics. The failure mechanisms of the box beams involving geometric, material and contact nonlinearities are discussed in detail. The study shows that compressive crushing failure, driven by local buckling of shear webs, determines the ultimate strength of the box beams under flapwise loading, and adhesive joint debonding, initiated by local adhesive cracking and spar cap buckling, is the critical failure mode of the box beams under edgewise loading. The Brazier effect and shear nonlinearity contribute to the initial failure depending on the loading directions. Debonding rather than delamination characterizes post-collapse behavior of all box beams examined in this study.

**General information**
State: Published
Organisations: Department of Wind Energy, Wind Turbine Structures and Component Design, Chinese Academy of Sciences
Authors: Tang, J. (Ekstern), Chen, X. (Intern)
Pages: 19-34
Publication date: 15 Aug 2018
Main Research Area: Technical/natural sciences

**Publication information**
Journal: Composite Structures
Volume: 198
ISSN (Print): 0263-8223
Ratings:
- BFI (2018): BFI-level 2
- Web of Science (2018): Indexed yes
- BFI (2017): BFI-level 2
  - Scopus rating (2017): CiteScore 4.52 SJR 1.905 SNIP 1.939
- Web of Science (2017): Impact factor 4.101
- Web of Science (2017): Indexed yes
- BFI (2016): BFI-level 2
  - Scopus rating (2016): CiteScore 4.45 SJR 2.162 SNIP 2.044
- Web of Science (2016): Impact factor 3.858
- Web of Science (2016): Indexed yes
- BFI (2015): BFI-level 2
  - Scopus rating (2015): SJR 2.157 SNIP 2.208 CiteScore 4.25
- Web of Science (2015): Indexed yes
- BFI (2014): BFI-level 2
  - Scopus rating (2014): SJR 2.294 SNIP 2.483 CiteScore 4.03
- Web of Science (2014): Impact factor 3.318
- Web of Science (2014): Indexed yes
- BFI (2013): BFI-level 2
  - Scopus rating (2013): SJR 1.964 SNIP 2.878 CiteScore 3.7
- ISI indexed (2013): ISI indexed yes
- Web of Science (2013): Indexed yes
- BFI (2012): BFI-level 2
  - Scopus rating (2012): SJR 1.779 SNIP 2.77 CiteScore 2.85
- Web of Science (2012): Impact factor 2.231
- ISI indexed (2012): ISI indexed yes
- Web of Science (2012): Indexed yes
- BFI (2011): BFI-level 2
  - Scopus rating (2011): SJR 1.627 SNIP 2.567 CiteScore 2.68
- Web of Science (2011): Impact factor 2.24
- ISI indexed (2011): ISI indexed yes
- BFI (2010): BFI-level 2
  - Scopus rating (2010): SJR 1.528 SNIP 2.349
Breakfast in Denmark. Prevalence of Consumption, Intake of Foods, Nutrients and Dietary Quality. A Study from the International Breakfast Research Initiative

Breakfast is considered by many to be the most important meal of the day. This study examined the intake of nutrients and foods at breakfast among Danes and the relation to the overall dietary quality. Data were derived from the Danish National Survey on Diet and Physical Activity 2011-2013, a cross-sectional national food consumption study. A total of 3680 participants aged 6-75 years were included in the analyses of breakfast consumption. The Nutrient Rich Food Index 9.3 method was used to examine the overall dietary quality of the diet. The intake of nutrients and foods at breakfast were compared across dietary quality score tertiles by ANCOVA adjusted for energy and socio economic status. Breakfast was eaten frequently by children and adults and contributed with 18-20% of total energy intake. Breakfast was relatively high in dietary fibre, B vitamins, calcium and magnesium and low in added sugar, total fat, sodium, vitamin A and D. A decrease in the intake of added sugar, total fat and saturated fat and an increase in the intake of dietary fibre and most micronutrients were seen across tertiles of dietary quality scores. Commonly consumed foods provided at breakfast in Denmark included bread, breakfast cereals and dairy products as well as water, coffee and juice, while intakes of fruits, vegetables, cakes and soft drinks were low.

General information
State: Published
Organisations: National Food Institute, Division of Risk Assessment and Nutrition, Department of Applied Mathematics and Computer Science, Statistics and Data Analysis
Authors: Fagt, S. (Intern), Matthiessen, J. (Intern), Thyregod, C. (Intern), Kørup, K. (Intern), Biltoft-Jensen, A. P. (Intern)
Number of pages: 20
Publication date: 14 Aug 2018
Main Research Area: Technical/natural sciences

Publication information
Journal: Nutrients
Volume: 10
Issue number: 8
Article number: 1085
ISSN (Print): 2072-6643
Ratings:
BFI (2018): BFI-level 1
Coherent Manipulation of a Molecular Ln-Based Nuclear Qudit Coupled to an Electron Qubit

We demonstrate that the [Yb(trensal)] molecule is a prototypical coupled electronic qubit-nuclear qudit system. The combination of noise-resilient nuclear degrees of freedom and large reduction of nutation time induced by electron-nuclear mixing enables coherent manipulation of this qudit by radio frequency pulses. Moreover, the multilevel structure of the qudit is exploited to encode and operate a qubit with embedded basic quantum error correction.

General information
State: Published
Organisations: Department of Chemistry, Organic Chemistry, University of Parma, Rutherford Appleton Laboratory, UdR Parma, University of Copenhagen
Authors: Hussain, R. (Ekstern), Allodi, G. (Ekstern), Chiesa, A. (Ekstern), Garlatti, E. (Ekstern), Mitcov, D. (Ekstern), Konstantatos, A. (Ekstern), Pedersen, K. S. (Intern), De Renzi, R. (Ekstern), Piligkos, S. (Ekstern), Carretta, S. (Ekstern)
Pages: 9814-9818
Publication date: 8 Aug 2018
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of the American Chemical Society
Volume: 140
Issue number: 31
CD4+ T cells have a major role in regulating immune responses. They are activated by recognition of peptides mostly generated from exogenous antigens through the major histocompatibility complex (MHC) class II pathway. Identification of epitopes is important and computational prediction of epitopes is used widely to save time and resources. Although there are algorithms to predict binding affinity of peptides to MHC II molecules, no accurate methods exist to predict which ligands are generated as a result of natural antigen processing. We utilized a dataset of around 14,000 naturally processed ligands identified by mass spectrometry of peptides eluted from MHC class II expressing cells to investigate the existence of sequence signatures potentially related to the cleavage mechanisms that liberate the presented peptides from their source antigens. This analysis revealed preferred amino acids surrounding both N- and C-terminuses of ligands, indicating sequence-specific cleavage preferences. We used these cleavage motifs to develop a method for predicting naturally processed MHC II ligands, and validated that it had predictive power to identify ligands from independent studies. We further confirmed that prediction of ligands based on cleavage motifs could be combined with predictions of MHC binding, and that the combined prediction had superior performance. However, when attempting to predict CD4+ T cell epitopes, either alone or in combination with MHC binding predictions, predictions based on the cleavage motifs did not show predictive power. Given that peptides identified as epitopes based on CD4+ T cell reactivity typically do not have well-defined termini, it is possible that motifs are present but outside of the mapped epitope. Our attempts to take that into account computationally did not show any sign of an increased presence of cleavage motifs around well-characterized CD4+ T cell epitopes. While it is possible that our attempts to translate the cleavage motifs in MHC II ligand elution data into T cell epitope predictions were suboptimal, other possible explanations are that the cleavage signal is too diluted to be detected, or that elution data are enriched for ligands generated through an antigen processing and presentation pathway that is less frequently utilized for T cell epitopes.
Trans fatty acids in adipose tissue and risk of myocardial infarction: A case-cohort study

Background The risk of coronary heart disease associated with intake of individual trans fatty acids (TFAs) is not clear. Adipose tissue content of TFAs is a biomarker of TFA intake and metabolism. Objective We investigated the rate of myocardial infarction (MI) associated with the adipose tissue content of total 18:1t, isomers of 18:1t (18:1 Δ6-10t and 18:1 Δ11t) and 18:2 Δ9c, 11t. Methods A case-cohort study, nested within the Danish Diet, Cancer and Health cohort (n = 57,053), was conducted, which included a random sample (n = 3156) of the total cohort and all incident MI cases (n = 2148) during follow-up (14 years). Information on MI cases was obtained by linkage with nationwide registers and validated. Adipose tissue was taken from the participants buttocks and the fatty acid composition was determined by gas chromatography. Results Women with higher adipose tissue content of total 18:1t had a 57% higher MI rate (quintiles 5 versus 1, hazard ratio, 1.57; 95% confidence interval, 1.12–2.20; P-trend = 0.011) and women with higher content of 18:1 Δ6-10t had a 76% higher MI rate (quintiles 5 versus 1, hazard ratio, 1.76; 95% confidence interval, 1.23–2.51; P-trend = 0.002). No association between 18:1 Δ11t content and MI rate was observed. In men, no associations between adipose tissue content of total 18:1t and 18:1 Δ6-10t and MI rate were observed. However, men with higher content of 18:1 Δ11t had a 48% higher MI rate (quintiles 5 versus 1, hazard ratio, 1.48; 95% confidence interval, 1.17–1.86; P-trend = 0.003). Adipose tissue content of 18:2 Δ9c, 11t was not associated with MI rate in women or men. Conclusions Adipose tissue content of 18:2 Δ9c, 11t was not associated with MI rate in women or men, whereas higher contents of isomers of 18:1t were associated with higher MI rates but the associations for individual 18:1t isomers differed, however, in women and men.

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Abundance and diversity of the faecal resistome in slaughter pigs and broilers in nine European countries

Antimicrobial resistance (AMR) in bacteria and associated human morbidity and mortality is increasing. The use of antimicrobials in livestock selects for AMR that can subsequently be transferred to humans. This flow of AMR between reservoirs demands surveillance in livestock and in humans. We quantified and characterized the acquired resistance gene pools (resistomes) of 181 pig and 178 poultry farms from nine European countries, sequencing more than 5,000 Gb of DNA using shotgun metagenomics. We quantified acquired AMR using the ResFinder database and a second database constructed for this study, consisting of AMR genes identified through screening environmental DNA. The pig and poultry resistomes were very different in abundance and composition. There was a significant country effect on the resistomes, more so in pigs than in poultry. We found higher AMR loads in pigs, whereas poultry resistomes were more diverse. We detected several recently described, critical AMR genes, including mcr-1 and optrA, the abundance of which differed both between host species and between countries. We found that the total acquired AMR level was associated with the overall country-specific antimicrobial usage in livestock and that countries with comparable usage patterns had similar resistomes. However, functionally determined AMR genes were not associated with total drug use.

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First record of the non-indigenous jellyfish Blackfordia virginica (Mayer, 1910) in the Baltic Sea
Marine invasions are of increasing concern for biodiversity conservation worldwide. Gelatinous macrozooplankton contain members, which have become globally invasive, for example the ctenophore Mnemiopsis leidyi or the hydromedusae Blackfordia virginica. B. virginica is characterised by a large salinity tolerance, with a brackish-water habitat preference, and by a metagenic life history strategy with an alternation between sexually reproducing planktonic medusae and asexually reproducing benthic polyps to complete the life cycle. In this study we analysed 8 years of ichthyoplankton survey data (2010-2017) from the Kiel Canal and 14 ichthyoplankton summer surveys in the central Baltic Sea (2008-2017). We report the first presence of B. virginica in northern Europe, namely from the southwestern Baltic Sea and the
Kiel Canal. In the Kiel Canal, B. virginica was first sporadically sighted in 2014 and 2015 and has developed persistent populations since summer 2016. Changes in size-frequency distributions during summer 2016 indicate active recruitment in the Kiel Canal at salinities between 7 and 13 and temperatures > 14 °C. Close vicinity to and direct connection with the southwestern Baltic Sea, where B. virginica was observed during 2017, indicate that the Baltic Sea and other brackish-water habitats of Northern Europe are at risk for colonisation of this non-indigenous species. Our results highlight that monitoring activities should consider gelatinous macrozooplankton for standard assessments to allow for the detection of non-indigenous species at an early stage of their colonisation.

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Scopus rating (2010): SJR 0.781 SNIP 0.83
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Parasites in Myodes glareolus and their association with diet assessed by stable isotope analysis

Vertebrates are hosts to numerous parasites, belonging to many different taxa. These parasites differ in transmission, being through either direct contact, a faecal-oral route, ingestion of particular food items, vertical or sexual transmission, or by a vector. Assessing the impact of diet on parasitism can be difficult because analysis of faecal and stomach content are uncertain and labourious; and as with molecular methods, do not provide diet information over a longer period of time. We here explored whether the analysis of stable isotopes in hair provides insight into the impact of diet and the presence of parasites in the rodent Myodes glareolus. Twenty-one animals were examined for parasites and their hair analysed for stable isotopes (C and N). A positive correlation between δ15N and one species of intestinal parasite was observed in females. Furthermore, several ectoparasites were negatively correlated with δ15N, indicating that infections are further associated with foraging habits (size and layout of the home range, length and timing of foraging, interaction with other rodents, etc.) that set the rodents in direct contact with infected hosts. Although a limited number of animals were included, it seemed that the isotope values allowed for identification of the association between diet and parasite occurrence in this rodent. We therefore propose that this method is useful in providing further insight into host biology, feeding preferences and potential exposure to parasites species, contributing to the understanding of the complex relationship between hosts and parasites.
Workshop on acceleration of the validation and regulatory acceptance of alternative methods and implementation of testing strategies

This report describes the proceedings of the BfR-RIVM workshop on validation of alternative methods which was held 23 and 24 March 2017 in Berlin, Germany. Stakeholders from governmental agencies, regulatory authorities, universities, industry and the OECD were invited to discuss current problems concerning the regulatory acceptance and implementation of alternative test methods and testing strategies, with the aim to develop feasible solutions. Classical validation of alternative methods usually involves one to one comparison with the gold standard animal study. This approach suffers from the reductionist nature of an alternative test as compared to the animal study as well as from the animal study being considered as the gold standard. Modern approaches combine individual alternatives into testing strategies, for which integrated and defined approaches are emerging at OECD. Furthermore, progress in mechanistic toxicology, e.g. through the adverse outcome pathway approach, and in computational systems toxicology allows integration of alternative test battery results into toxicity predictions that are more fine-tuned to the human situation. The road towards transition to a mechanistically-based human-focused hazard and risk assessment of chemicals requires an open mind towards stepping away from the animal study as the gold standard and defining human biologically based regulatory requirements for human hazard and risk assessment.

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