Europe PMC: the open literature database for the life sciences and platform for innovation

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Head of Literature Services
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Life Sciences
All living things are made from the same stuff
Interpreting human variation

How and why do we differ from one another?

What causes susceptibility to disease?

How do you compare millions of genomes?

What makes some people more sensitive to drugs?

How important are lifestyle choices?
Publishing, credit and attribution in the life sciences

• Journal publishing (not monographs, preprints or conf proc)

• Impact factors

• Cutting edge
  • Article level metrics
  • Alternative forms of credit e.g. for data sets
  • Emerging interest in preprints
7000 journals
Open Access
Open Access

- Funder and institutional policies
- read (green) → reuse (gold)
- Fully open vs. hybrid journals: relative APC costs
- Europe PMC funders recommend/require Europe PMC
- Why? Trust and discoverability through standard formats and aggregation
Open Science

Open Access
Open Data
Open Peer Review
MOOCs
Massive Online Open Courses
Open Source Software
Citizen Science

Pablo Dorta-González, 2017
Europe PMC
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- a partner in PubMed Central International
- 29 Funders

Access more content

- Abstracts
  - 32 million, 27 million from PubMed
- Patents
  - 4.2 million
- NHS guidelines
  - 799
- Agricola records
  - 630,000
- Full text articles
  - 4 million

Single search interface

+ APIs
Search worldwide, life-sciences literature

HER2 breast cancer

E.g. "breast cancer" HER2 Smith J

Results

1 - 25 of 41019 results

Sort by: Relevance | Date | Times Cited

Select results 1 - 25

Neratinib Approved for HER2+ Breast Cancer.
Cancer Discov [04 Aug 2017, 7(9):OF1]
extended adjuvant treatment of early-stage HER2-positive breast cancer. The decision adds another treatment
Cited: 1 time (PMID:28778899)

Metastatic HER2+ Breast Cancer: A Potentially Curable Disease?
Cureus [05 Sep 2017, 9(9):e1654]
history of metastatic HER2-positive breast cancer, transforming it from an aggressive cancer subtype with a ... Predictor of Response to Dual HER2 Blockade in HER2-positive Early Breast Cancer) trial further evaluated
Cited: 0 times (PMID:29142802 PMCID:PMC5669532)
Collaboration with USA, and dependencies
Sub-minute Phosphoregulation of Cell Cycle Systems during Plasmodium Gamete Formation

Brandon M. Invergo, Mathieu Brochet, Lu Yu, Iyoti Choudhary, Pedro Beltrao, and Oliver Billker

Summary

The transmission of *malaria* parasites to mosquitoes relies on the rapid induction of sexual reproduction upon their ingestion into a blood meal. Haploid female and male gametocytes become activated and emerge from their host cells, and the males enter the cell cycle to produce eight microgametes. The synchronized nature of gametogenesis allowed us to investigate phosphorylation signaling during its first minute in *Plasmodium berghei* via a high-resolution time course of the phosphoproteome. This revealed an unexpectedly broad response, with proteins related to distinct cell cycle events undergoing simultaneous phosphoregulation. We implicate several protein kinases in the process, and we validate our analyses on the plant-like calcium-dependent protein kinase 4 (CDPK4) and a homolog of serine/arginine-rich protein kinases (SRPK1). Mutants in these kinases displayed distinct phosphoproteomic disruptions, consistent with differences in their phenotypes. The results reveal the central role of protein phosphorylation in the atypical cell cycle regulation of a divergent eukaryote.

Keywords: gametogenesis, proteomics, signal transduction, ARK2, CRK5

Graphical Abstract

*Plasmodium Gametogenesis*
Maximizing reuse of research

- Europe PMC is an open community platform
- Specialist scientific knowledge allows rich services and community engagement
- European science context
Beyond the PDF

- Dataset list
- Cross-ref.
- Cross-ref.
- Figure caption/graphics
- Ref. to external resources
- Reference list

Fig. source data:
- file, URL, DOI
- Supp. info tables/data:
  - file, URL, DOI

Data/institutional repositories:
- author database:
  - file, structured record
  - URL, DOI, API+Accession
Salt-inducible kinase 3, SIK3, is a new gene associated with hearing.


Department of Twin Research and Genetic Epidemiology, King’s College London, London SE1 9NH, UK.

Human Molecular Genetics (2014, 23(23):6407-6418)

Type: Article, Meta-Analysis, Research Support

DOI: 10.1093/hmg/ddu346

Abstract

Hearing function is known to be heritable, but the specific genetic variants that contribute most to the population results of hearing function from the G-EAR consortium and TwinsUK were used for meta-analysis. Hearing ability in eight population samples of Northern and Southern European ancestry (N = 4991) and the Silk Road (N = 348) was measured using pure-tone audiometry and summarized using principal component (PC) analysis. Genome-wide association analyses for PC1-3 were conducted separately in each sample assuming an additive model adjusted for age, sex and relatedness of subjects. Meta-analysis was performed using 2.3 million single-nucleotide polymorphisms (SNPs) tested against each of the three PCs of hearing ability in 4939 individuals. A single SNP lying in intron 6 of the salt-inducible kinase 3 (SIK3) gene was found to be associated with hearing PC2 (P = 3.7×10^{-8}) and further supported by whole-genome sequence in a subset. To determine the relevance of this gene in the ear, expression of the SIK3 protein was studied in mouse cochlea of different ages. SIK3 was expressed in murine hair cells during early development and in cells of the spiral ganglion during early development and adulthood. Our results suggest a developmental role of SIK3 in hearing and may be required for the maintenance of adult auditory function.
Background

Amyotrophic lateral sclerosis (ALS) is characterized by a progressive degeneration of motor neurons in brain and the spinal cord, resulting in muscle weakness. Patients eventually become paralyzed and approximately 50% die within 3 years of onset of symptoms, usually as the result of respiratory failure [1]. Although the precise mechanisms of ALS remain unclear, approximately 20% of patients with ALS have dominant mutations in the Cu/Zn superoxide dismutase 1 (SOD1) gene [2]. Transgenic mice overexpressing the mutant human SOD1 gene (mSOD1 mice) develop progressive motor neuron degeneration that resembles ALS and therefore these mice serve as an excellent animal model for the disease [3].

Although ALS is characterized by motor neuron degeneration, infiltration of T lymphocytes are significant pathological and mSOD1 mice, and a role for these cells in the pathology of ALS has been suggested in the pathogenesis of ALS. In vitro experiments in mSOD1 mice suggest that neurons do not die autonomously and depends on the active participation of non-neuronal and T cells [7-9].

Microglia, resident immune effector cells in the central nervous system (CNS), display functional plasticity during activation, which involves changes in cell number, morphology, surface receptors, and production of growth factors and cytokines [10]. T-cell-derived cytokines play critical roles in the control of the microglial phenotype. For example, classically activated microglia (M1 microglia) differentiate in response to granulocyte macrophage colony-stimulating factor (GM-CSF) and are primed by interferon gamma (IFN-γ), one of the most important cytokines produced by T helper 1 (Th1) cells, in the presence of lipopolysaccharide (LPS) [10,11]. M1 microglia secrete increased proinflammatory cytokines, superoxide radicals, nitric oxide (NO), and reduced neurotrophic factors, which promote neuronal death [12]. In contrast, representative T helper 2 (Th2) cytokines, such as interleukin 4 (IL-4) and interleukin 13 (IL-13), can convert microglia, primed by macrophage colony-stimulating factor (M-CSF), to an alternatively activated M2 phenotype [13]. M2 microglia are also characterized by increased expressions of arginase 1 (Arg1), resistin-like alpha (Relnla), and chitinase 3-like 3 (C3orf75), which play important roles in tissue repair and remodeling [10]. However, the precise roles of crosstalk between T cells and microglia in the pathology of ALS remain unknown.
Open Targets: Target Validation Platform
www.targetvalidation.org
DATA? (UHH)
OVER THERE

PUBLICATIONS AND DATA

Anon, DANS
BioStudies and Europe PMC – reproducible science

Ingestion
Packaging
Integration

Databases
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BioStudies

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Life sciences databases
Generic repositories
Particules with similar LET values generate DNA breaks of different complexity and reparable: a high-resolution microscopy analysis of γH2AX/53BP1 foci

Lucie Ježková, Maria Zadneprianets, Elena Kulikova, Elena Smirnova, Tatiana Bulanova, Daniel Depes, Iva Falkova, Alla Boreyko, Eugeny Krasavin, Marie Davidkova, Stanislav S. Katsavos, Olga Valentova and Martin Falk

Different particles with similar LET and energy may generate different DNA damage with consequences for DNA double-strand break repair.

The article was first published on 12 Dec 2017
Nanoscale, 2018, 10, 1162-1179
http://dx.doi.org/10.1039/C7NR06829H

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Europe PMC Key Communities and user research
Preprints
Preprints in Biology

Too much data!

- Competition to publish in very small number of journals
Preprints

Power Analysis of Single Cell RNA-Sequencing Experiments

**(RR:PRR2010)**

This article is a preprint: it has not been peer-reviewed.

**Abstract**

Svensson V, Natarajan KN, Ly L, Miragala Pit, Laubelette C, Macaulay IC, Cevcic A, Teichmann SA

BioRxiv (08 Sep 2016)

Type: Preprint

DOI: 10.1101/073692

A later version of this preprint was published as "Power analysis of single-cell RNA-sequencing experiments," Nature methods, 2017 Apr;14(4):381-387.

**Methods**

Mouse embryonic stem (mES) cells culture

Wildtype E14 mouse ES cells (kindly provided by Pentao Liu, Wellcome Trust Sanger Institute) were cultured on gelatin coated dishes using Knockout DMEM (#10829; Gibco), 15% Fetal Calf Serum (FB-1001;500; batch tested from Labtech), 1x Penicillin-Streptomycin-Glutamine (#10378-016; Gibco), 1x MEM-NSA (11140-035; Gibco), Promocell enriched (P1950,010; Gibco) and 1000U Leukemia Inhibitory Factor (LIF, #ESG1107). Mycoplasma-free tested mES cells were passaged every 2-3 days.

\[
E_{ij} = \sum_{k} w_{ij} f_{ij} - P_{ij} \\
\mu = \sum_{j} E_{ij}/N \\
\sigma^2 = \sum_{j} (E_{ij} - \mu)^2/N - \mu^2 \\
K_{ij} = \frac{\sum w_{ij}(f_{ij} - \mu)^2}{\sigma^2}
\]

7. Bond MR, Hanover JA. A little sugar goes a long way: the cell biology of O-GlcNAc. J Cell Biol, 2015; 208: 869-880 [https://doi.org/10.1083/jcb.201501101] [Europe PMC Abstract] [Europe PMC Full Text]

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