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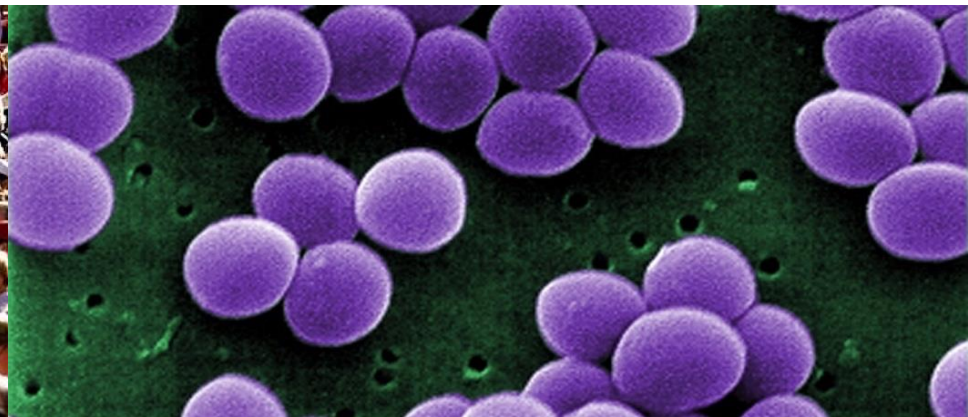
Jo McEntyre
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Life Sciences



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Interpreting human variation

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another?

What causes
susceptibility
to disease?

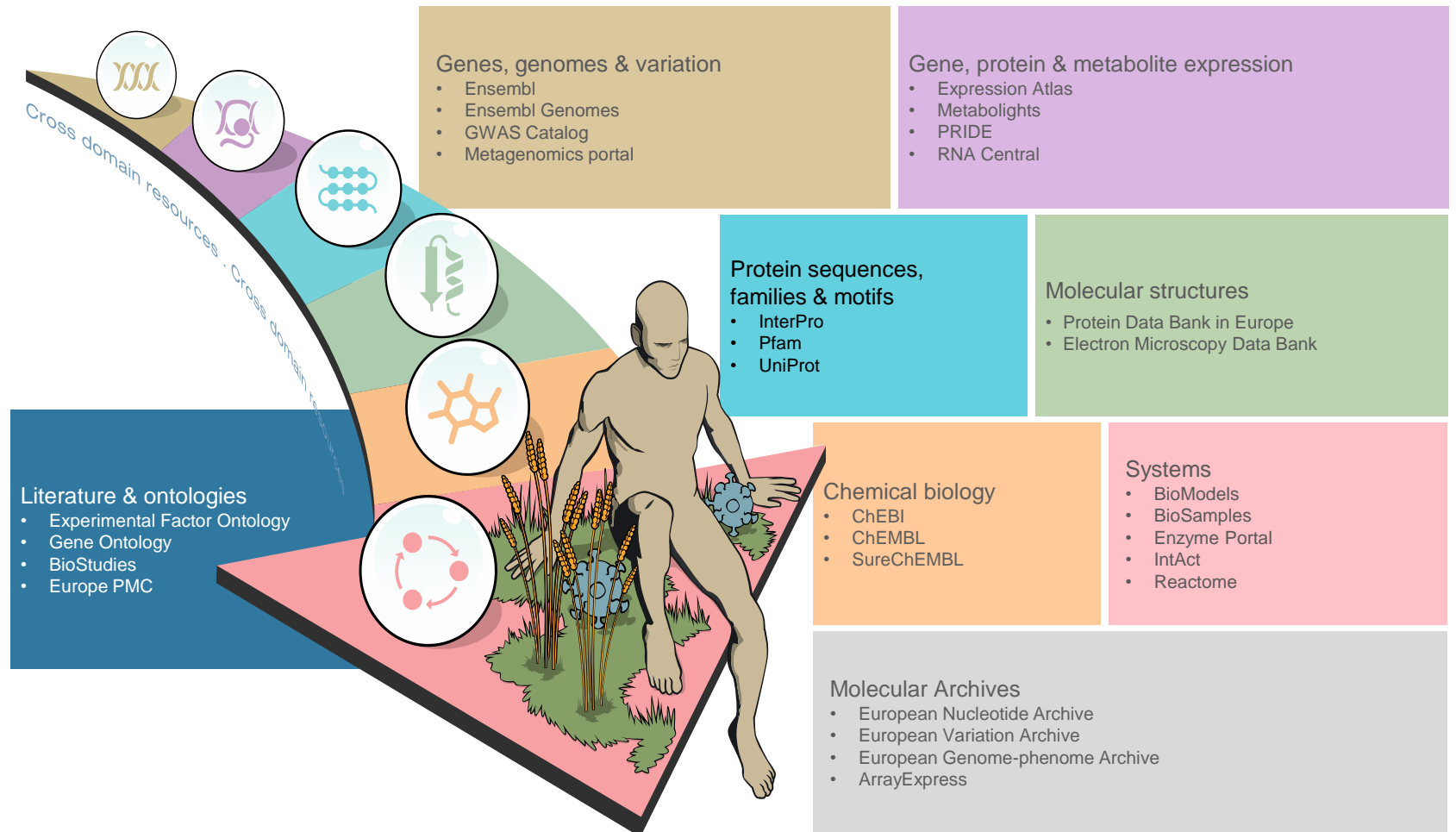
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to drugs?

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choices?



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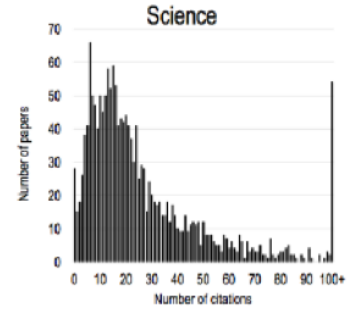
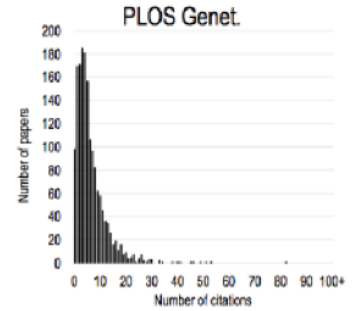
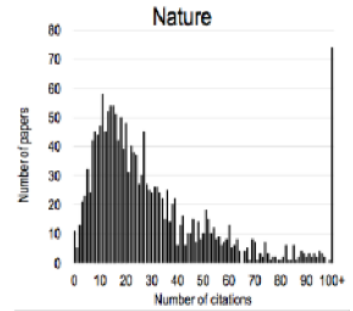
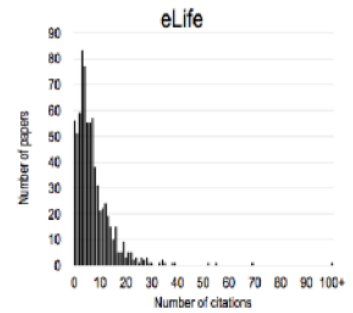


Publishing, credit and attribution in the life sciences

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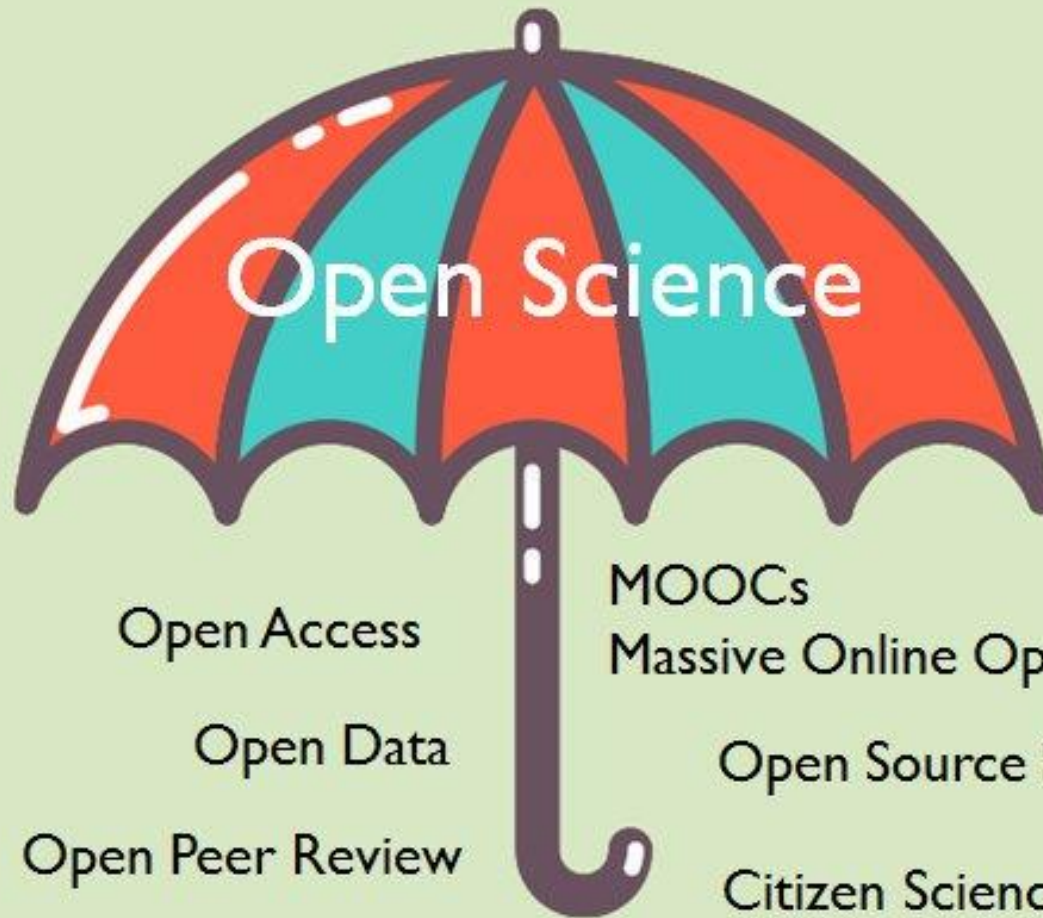
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Pablo Dorta-González, 2017

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MS
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**Alzheimer's
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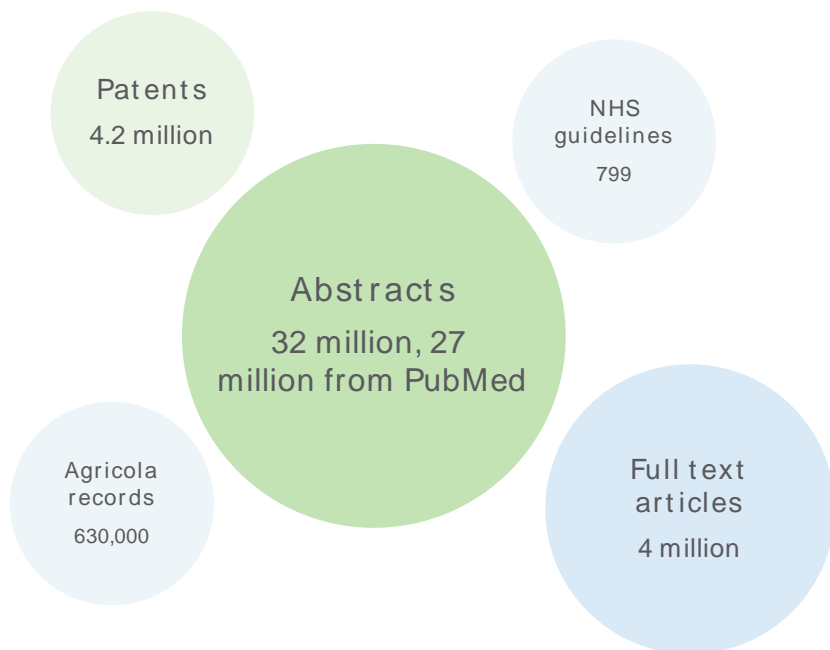
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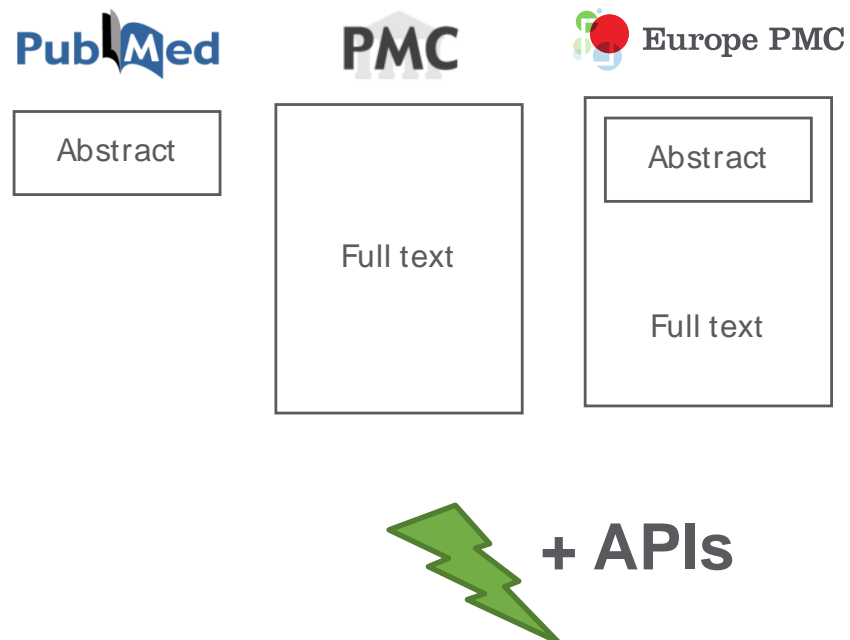
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Cancer Discov [04 Aug 2017, 7(9):OF1]

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?](#)

Prior L, Lim M, Ward C, Featherstone H, Murray H, D'Arcy C, Crown J, Gullo G

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

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Sub-minute Phosphoregulation of Cell Cycle Systems during Plasmodium Gamete Formation.

(PMID:29141230 PMCID:PMC5700370)

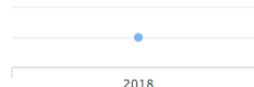
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Cell Rep. 2017 Nov 14; 21(7): 2017-2029. PMCID: PMC5700370
 Published online 2017 Nov 14. doi: [10.1016/j.celrep.2017.10.071](https://doi.org/10.1016/j.celrep.2017.10.071)

Sub-minute Phosphoregulation of Cell Cycle Systems during *Plasmodium* Gamete Formation

Brandon M. Invergo,^{1,2,6} Mathieu Brochet,^{2,4,6} Lu Yu,^{3,5} Jyoti Choudhary,^{3,5,*} Pedro Beltrao,^{1,*} and Oliver Billker^{2,7,*}

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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

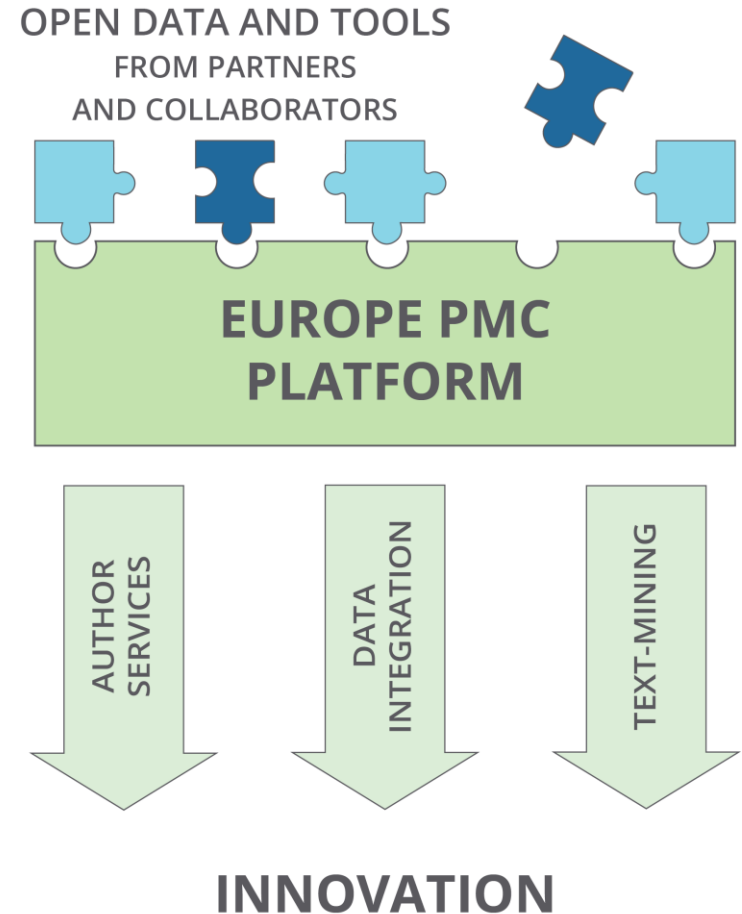
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Plasmodium Gametogenesis



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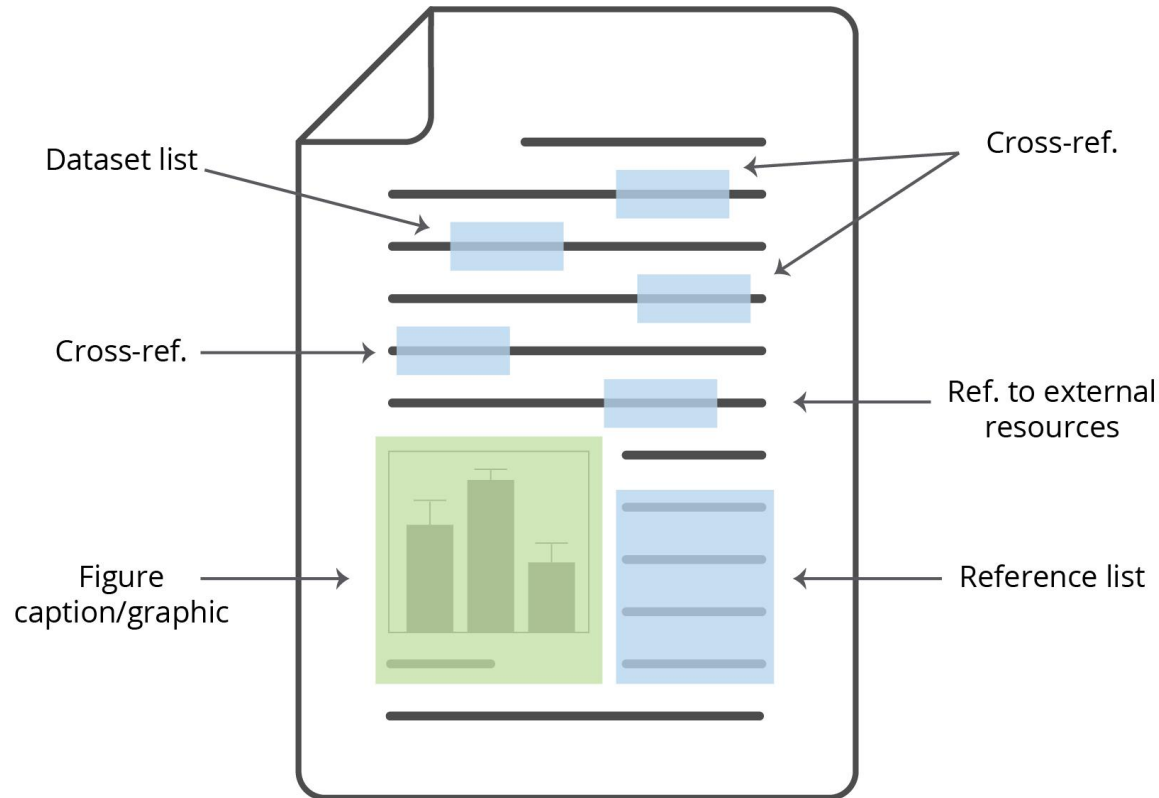


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Integrating Open Data



- Salt-inducible kinase 3, SIK3, is a new gene associated with hearing. (PMID:25060954 PMID:PMC4222365)

Abstract Citations BioEntities Related Articles External Links

Wolber LE, Girotto G, Buniello A, Vuckovic D, Pirastu N, Lorente-Cánovas B, Rudan I, Hayward C, Polasek O, Ciullo M, Mangino M, Steves C, Concas MP, Cocca M, Spector TD, Gasparini P, Steel KP, Williams FM

Department of Twin Research and Genetic Epidemiology, Imperial College London, London, UK.

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

Type: Journal Article, Meta-Analysis, Research Support
DOI: 10.1093/hmg/ddu346

Frances Williams

Imperial College London

Author Profile

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Abstract

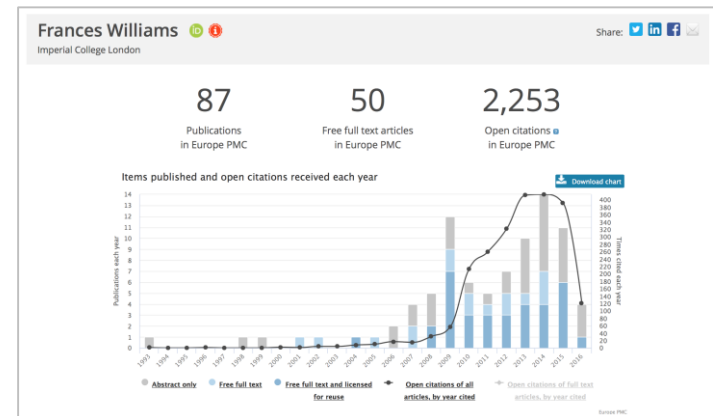
Hearing function is known to be heritable, but few genetic variants have been identified to date in the adult population. Association results of hearing function from the G-EAR consortium and TwinsUK were used for meta-analysis. Hearing ability in eight population samples of Northern and Southern European ancestry (n = 4591) 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.

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Background

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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 2% 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 appropriate animal model for the disease [3].

Although ALS is characterized by motor neuron degeneration, infiltration of T lymphocytes are significant pathological features and mSOD1 mice, and a role for these cells in the pathogenesis. Experiments in mSOD1 mice suggest that neurons do not degenerate autonomously and depends on the active participation of microglia 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 [12]. M2 microglia are also characterized by increased expressions of arginase 1 (Arg1), resistin-like alpha (Retnla), and chitinase 3-like 3 (Ym1), 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.

Gene-Disease OpenTargets

SOD1	—	ALS
OpenTargets		OpenTargets

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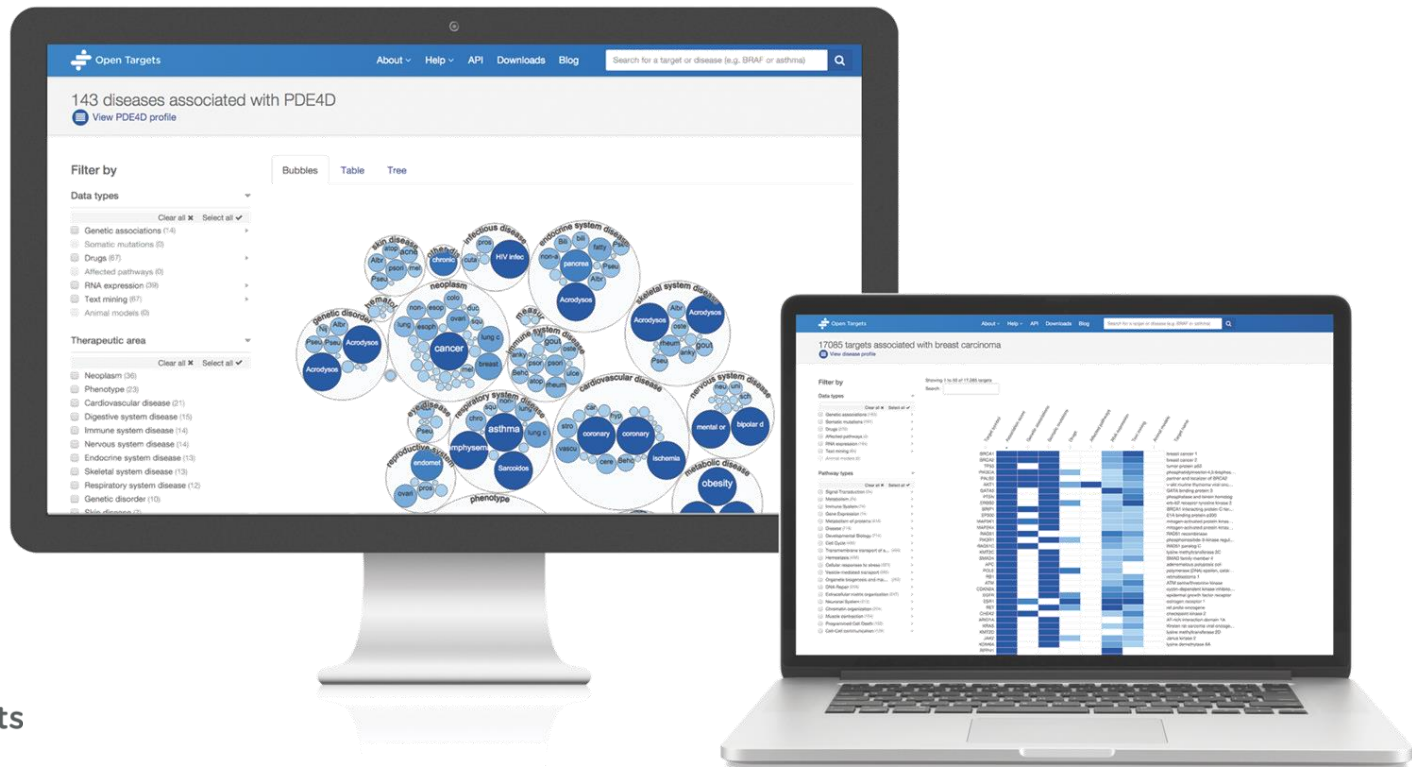
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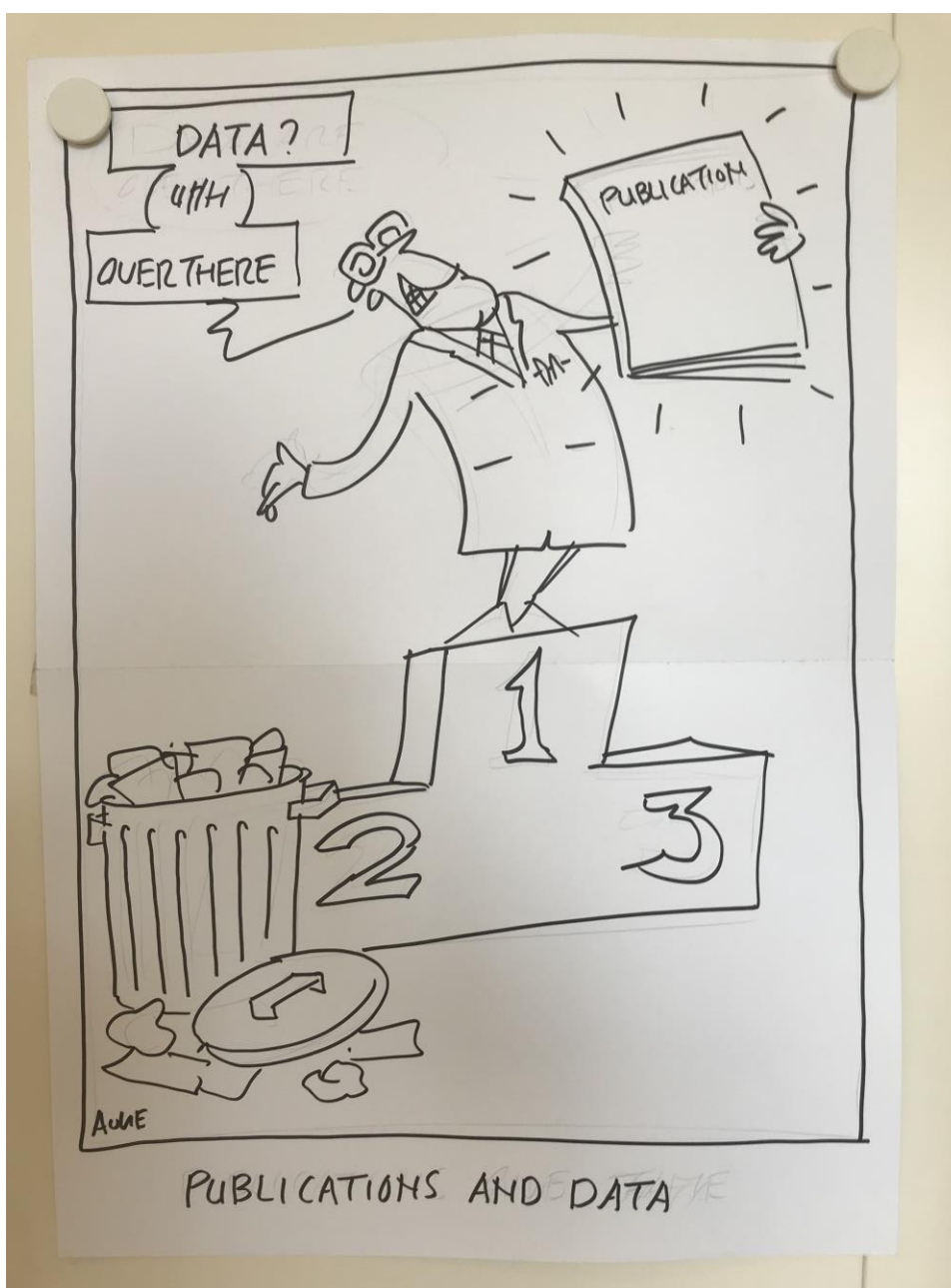


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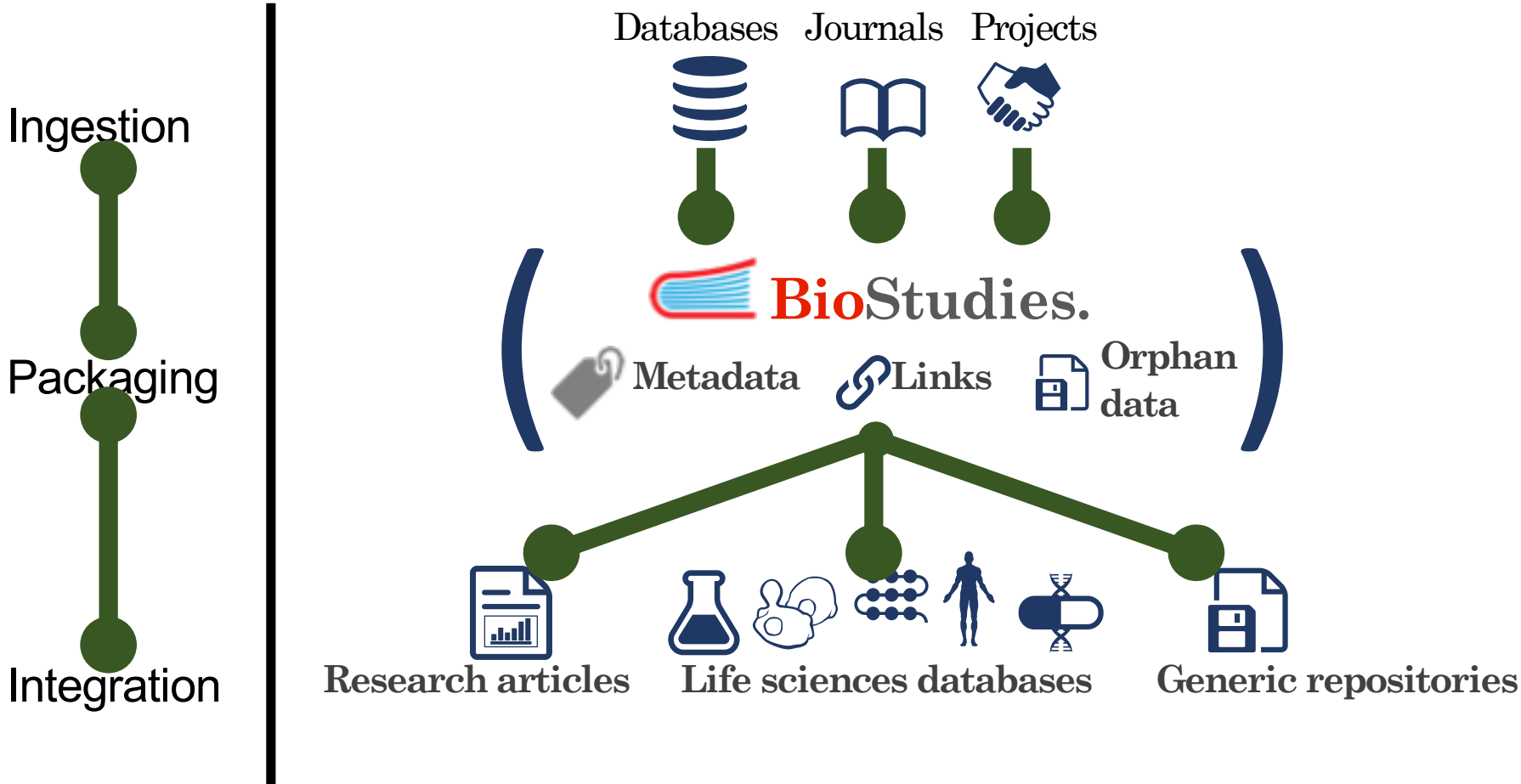
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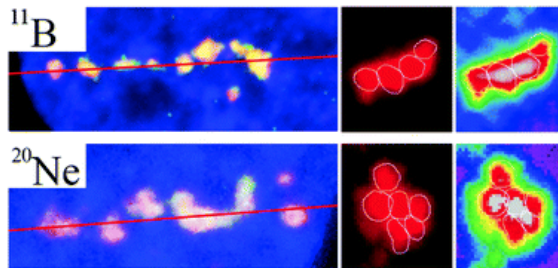




Particles with similar LET values generate DNA breaks of different complexity and reparability: a high-resolution microscopy analysis of γ H2AX/53BP1 foci

Lucie Jezkova, Mariia Zadneprianetc, Elena Kulikova, Elena Smirnova, Tatiana Bulanova, Daniel Depes, Iva Falkova, Alla Boreyko, Evgeny Krasavin, Marie Davidkova, Stanislav Olga Valentova and Martin Falk

Different particles with similar LET and energy may generate different types of 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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Feasibility and constraints of particle targeting using the antigen-antibody interaction. (PMID:24170264 PMID:PMC4047836)

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Tokárová V¹, Pittermannová A, Král V, Řezáčová P, Štěpánek F

Affiliations

Nanoscale [29 Oct 2013, 5(23):11490-11498]

Type: Research Support, Non-U.S. Gov't, research-article, Journal Article

DOI: [10.1039/c3nr04340a](https://doi.org/10.1039/c3nr04340a)

Abstract

This work is concerned with the surface modification of fluorescent silica nanoparticles by a monoclonal antibody (M75) and the specific bioadhesion of such particles to surfaces containing the PG domain of carbonic anhydrase IX (CA IX), which is a trans-membrane protein specifically expressed on the surfaces of several tumor cell lines. The adhesion strength of antibody-bearing silica nanoparticles to antigen-bearing surfaces was investigated under laminar flow conditions in a microfluidic cell and compared to the adhesion of unmodified silica nanoparticles and nanoparticles coupled with an unspecific antibody. Adhesion to cancer cells using flow cytometry was also investigated and in all cases the adhesion strength of M75-modified nanoparticles was significantly stronger than for the unmodified or unspecific nanoparticles, up to several orders of magnitude in some cases. The specific modification of nano- and microparticles by an antibody-like protein therefore appears to be a feasible approach for the targeting of tumor cells.

Supporting Data

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Data behind this article

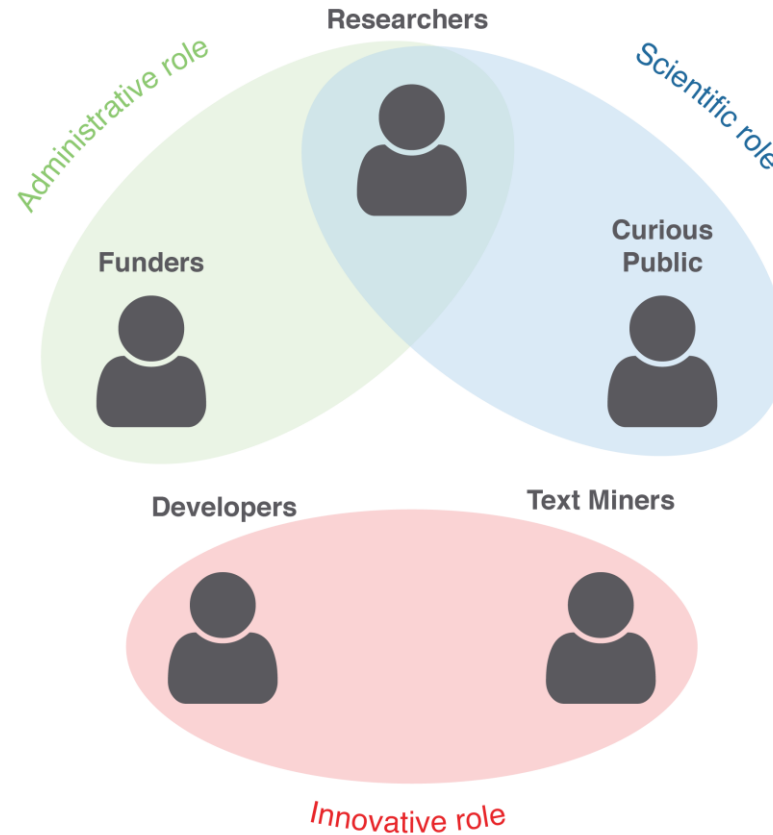
Funding

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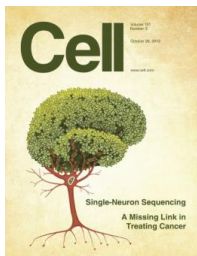
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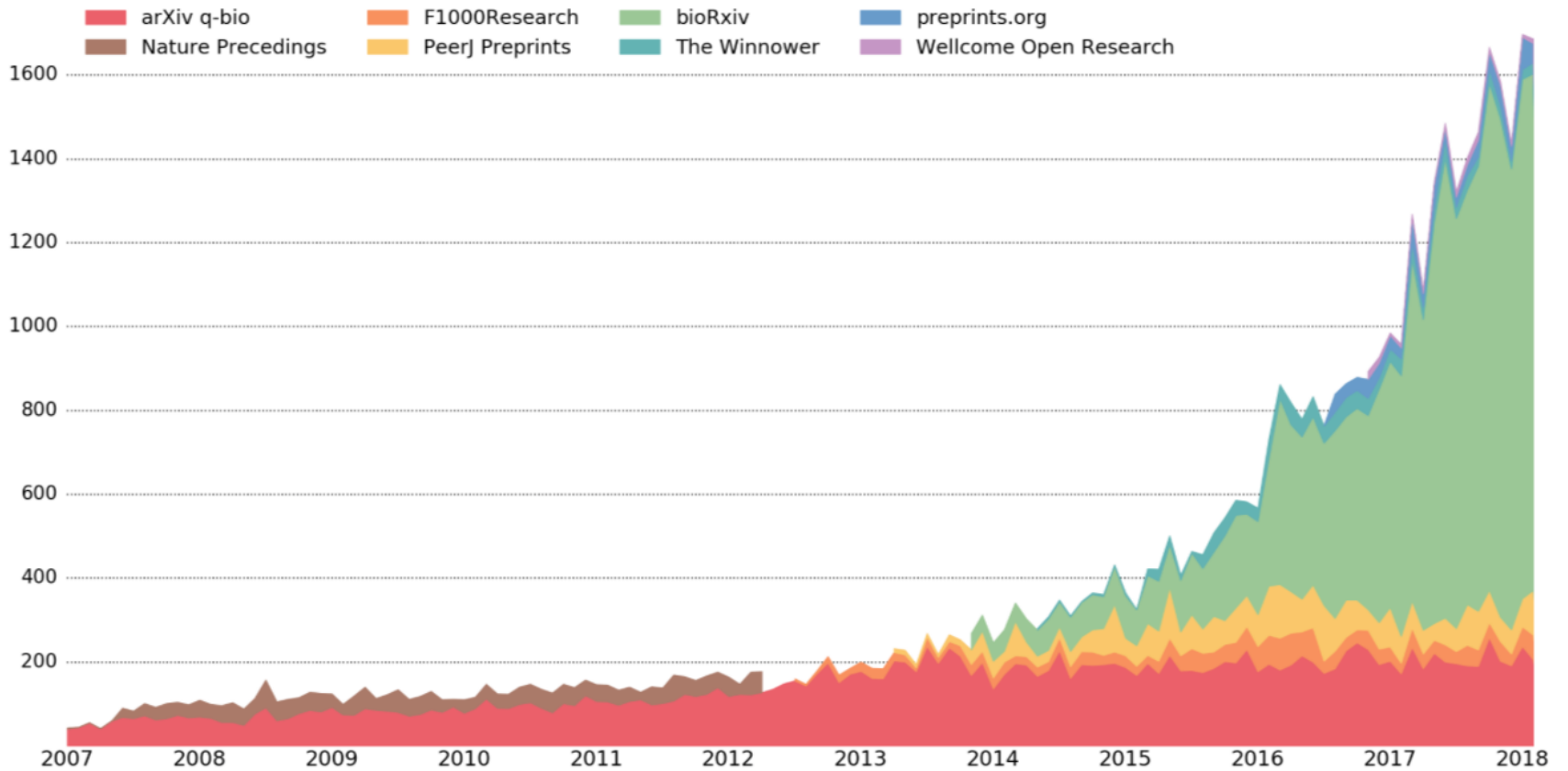
Too much data!

- Competition to publish in very small number of journals





Preprints per Month



Jordan Anaya

Preprints

Power Analysis of Single Cell RNA-Sequencing Experiments

(PPR:PPR7010)

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

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Svensson V, Natarajan KN, Ly L, Miragaia RJ, Labalette C, Macaulay IC, Cvejic A, Teichmann SA

BioRxiv [08 Sep 2016]

Type: Preprint

DOI: [10.1101/073692](https://doi.org/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 NEAA (11140-035; Gibco), 2-mercaptoethanol (31350-010; Gibco) and 1000U Leukemia Inhibitory Factor (LIF; #ESG1107). Mycoplasma-free tested mES cells were passaged every 2-3 days.

$$E_{ij} = \sum_L w_L (f_{ijL} - P_L)$$

$$\mu_i = \sum_j E_{ij} / N$$

$$\sigma_i^2 = \sum_j (E_{ij}^2 / N) - \mu_i^2$$

$$K_{Hij} = \frac{\sum_L w_L (f_{ijL} - \mu_L)}{\sigma_j}$$

- 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]
- Chepelianskii AD. Towards physical laws for software architecture. 2010
- Choi I, Kim R, Lim H-W, Kaestner KH, Won K-J. 5-hydroxymethylcytosine represses the activity of enhancers in embryonic stem cells: a new epigenetic signature for gene regulation. BMC Genomics, 2014; 15: 670 <https://doi.org/10.1186/1471-2164-15-670> [Europe PMC Abstract] [Europe PMC Full Text]
- Doerge CA, Inoue K, Yamashita T, Rhee DB, Travis S, Fujita R, Guarnieri P, Bhagat G, Vanti WB, Shih A, Levine RL, et al. Early-stage epigenetic modification during somatic cell reprogramming by Parp1 and Tet2. Nature, 2012; 488: 652-655 <https://doi.org/10.1038/nature11333> [Europe PMC Abstract] [Europe PMC Full Text]

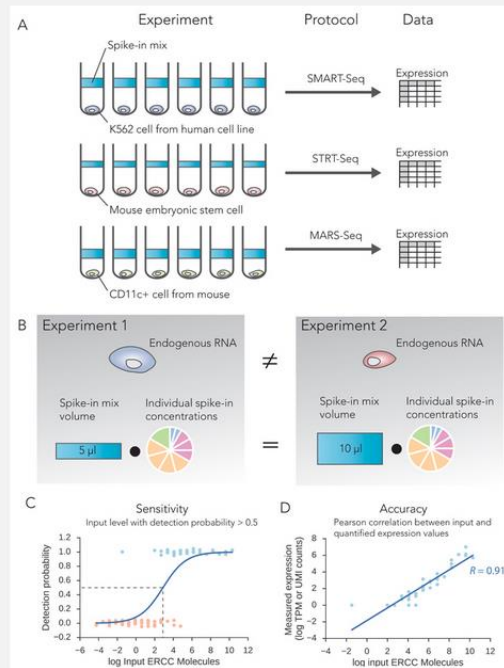
Figure 1: Overview of protocol comparison strategy.

(A) The data we use are from different protocols and investigate diverse cell types.

(B) Comparing protocols by looking at properties relating to the cells would be distorted by the diverse cell types involved. Since the same standard spike-in mix has been used in all of them, albeit at different concentrations, we can base our assessment on these synthetic RNA molecules.

We define two global technical performance metrics based on these: (C) Spike-in sensitivity: the number of spike-in molecules which need to be present in a sample before there is at least 50% chance of detecting them. This is inferred by logistic regression.

(D) Spike-in quantification accuracy: How well preserved the log-linear relation between input spike-ins is when quantifying the measured expression. We formulate this as the Pearson correlation between input molecules and output expression.



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NC3Rs
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FWF
Der Wissenschaftsfonds.

ACTION ON HEARING LOSS

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Marie Curie
Care and support through terminal illness

British Heart Foundation

The Dunhill Medical Trust

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