CV and publications of Dr. Alexey Larionov

PhD Oncology, MSc Bioinformatics, PgCert Academic Practices, Bachelor Medicine

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Current employment

***2013-present:* Research Associate (Bioinformatics)**
Department of Medical Genetics, School of Clinical Medicine, Cambridge University

Main tasks and responsibilities:
- Evaluate, select and develop tools and algorithms for the bioinformatics tasks required within the research group (focusing on secondary and statistical analyses)
- Evaluate and recommend IT infrastructure for the group (departmental server, HPC cluster, AWS etc).
- Support non-bioinformaticians in using my pipelines and third-party bioinformatics tools
- Contribute to preparation of manuscripts and grants applications, present results on international conferences
- Supervise postgraduate students and mark theses for the Genomic Medicine masters course provided by the Department

My current focus is (i) exploring the opportunities provided by the 100-thousand genomes dataset for genetic association analyses and (ii) supporting diverse analyses for internal datasets aimed to study heritable predisposition to cancer.

During this employment I performed analyses for a range of different projects (from small rare disease datasets to multi-thousand analyses using the 100-thousand genomes data) in different computational environments (including HPC clusters, cloud computing (AWS) and local servers). My pipeline for WES data analysis (from FASTQ to VCF) have been used for many hundreds of samples generated within the Department. My analyses down-stream of VCF included variants annotation and prioritization, rare variants association analyses, selection of variants basing on functional and biological criteria, etc. While my main practical focus within the Department has been on WES and custom panels for germline sequencing, I also teach RNA-seq data analysis in EBI Cancer Genomic course, and I follow publications on a broad range of other bioinformatics methods, with special interest in long-read sequencing technologies and machine learning.

During the current employment I contributed to several well cited papers in reputable journals (see publications since 2013) and completed several trainings in different aspects of bioinformatics (ranging from High-Performance Computing to Genetic Analysis of Multifactorial Diseases, see bioinformatics trainings section).

Along with the bioinformatics tasks carried for the present employment, occasionally I continue publishing about hormonal and targeted treatments in breast cancer (carrying over from my previous job in Edinburgh) and teach in Endocrine Physiology and Pharmacology Honors course in Edinburgh University (invited lectures and exam marking); and I am a Fellow of The Higher Education Academy (UK).

My academic activities also included reviewing and editing: I reviewed for BMC Bioinformatics, Genome Medicine, Pharmaceutical Statistics and other journals, I edited a book for Springer in 2015 (see https://publons.com/researcher/1373942/alexey-larionov/peer-review/ and http://www.springer.com/us/book/9783319179711) and I reviewed grants for CRUK and Breast Cancer Now.

Previous positions

2008-2013: **Research Fellow**
Edinburgh Cancer Research Centre, The University of Edinburgh, UK

My main task was to study transcriptional profiles of breast cancer biopsies to understand and predict response and resistance to aromatase inhibitors (a hormonal treatment) in breast cancer.
My specific tasks and responsibilities included:

- Selection of optimal sets of informative genes (based on differential gene expression between responders and non-responders)
- Design and validation of classification algorithms for response prediction (comparing regression models, SVM and decision tree- based algorithms)
- Low level microarray data analysis (mainly R-libraries for Illumina and Affymetrix RNA microarrays)
- Supervision and support for PhD, MSc and MD students within the research group
- Preparation of publications, grant applications and presenting results on international meetings

I reported scientific results obtained during that employment in multiple well cited papers and scientific meetings (see list of publications prior 2013). Along with bioinformatics and wet-lab tasks during that employment I completed MSc in Applied Bioinformatics (Cranefield University, 2012) and PgCert in Academic Practices (Edinburgh University, 2013), reviewed papers for multiple journals and reviewed grants for Genesis Oncology Trust (currently The Cancer Research Trust, New Zeeland) and Health Research Board (HRB, Ireland).

2002 – 2007: **Research Fellow**
Breast Research Unit, Edinburgh Western General Hospital, HNS Lothian, UK

Tasks and responsibilities: Study mechanisms and markers of endocrine resistance in breast cancer, validate micro-array gene expression results with RT-qPCR:

- Development of real-time quantitative PCR methodology for gene expression measurements in clinical samples of breast cancer
- Organizing clinical samples storage and clinical annotations
- Extraction of RNA from tumour biopsies, design and validation of PCR primers, qPCR data analysis

During that employment I performed qPCR analysis in hundreds of samples for multiple genes pre-selected from previous micro-array results. Also, I developed and published a standard curve based method for qPCR data analysis, which has already been cited 700+ times (Larionov et al, BMC bioinformatics, 2005).

2001 – 2002
Clinical Research Associate
PSI Pharma Support Inc., St. Petersburg, Russia
Monitoring patients' well-being and regulatory compliance in breast cancer clinical trials.

2000
Postdoctoral Research Fellow (fellowship awarded by the Royal Society)
Breast Research Unit, The University of Edinburgh, UK
Study local estrogen production in breast cancer tissue and in other peripheral tissues. Resulted into two well-cited 1-st author papers.

1992 – 1999
Postgraduate student (specialization in clinical oncology) then **PhD student** (oncology) then **Researcher**
N.N.Petrov Institute of Oncology, St. Petersburg, Russia

Education

2011-2013	**Postgraduate Certificate in Academic Practices** Edinburgh University, UK
2010-2012	**MSc in Applied Bioinformatics** (bursary awarded by BBSRC) Cranfield University, UK
2001-2002	**Postgraduate Certificate in computer sciences** State Polytechnical University, St. Petersburg, Russia
1994-1997	**PhD in oncology** – recognized by UK NARIC N.N.Petrov Institute of Oncology, St. Petersburg, Russia
1992-1994	**Postgraduate specialization in medical oncology** N.N.Petrov Institute of Oncology, St. Petersburg, Russia
1984-1992	**Bachelor degree in medicine** (diploma with distinction) – as recognized by UK NARIC I.P.Pavlov State Medical University, St. Petersburg, Russia

Additional bioinformatics trainings

2015	CRUK Bioinformatics Summer School: Best practices in the analysis of **RNA-Seq** and **ChIP-Seq** data (27-31 July, Cambridge)
2015	Wellcome Trust Advanced Course in Human Genome Analysis: Genetic **Analysis of Multifactorial Diseases** (11-17 July, Hinxton)
2015	Variant analysis with **GATK** (23-24 April 2015, Cambridge)
2014	**ARCHER** Summer School: Introduction to **High Performance Computing** & Programming with MPI (30 June-4 July, Edinburgh)

Other academic activities

Teaching	*Lecture and practical sessions on RNA-seq data analysis* EBI Cancer Genomics course, **2018-present** *Project supervision and marking* for MSt Genomic Medicine course, Cambridge University, **2017-present** *Invited lecturer and marking* for BSc Clin. Pharmacology course, Edinburgh University, **2012-preset** *Project supervision* for MSc Molecular Medicine course, Cranfield University, **2011**
Refereeing & editing	*Refereed papers* for Genome Medicine, Breast Cancer Research, BMC Cancer, Breast Cancer Research & Treatment, BMC Bioinformatics and for other journals (see more at https://publons.com/author/1373942/alexey-larionov#profile); Occasionally: Refereed grants (see details in employment sections after 2008); *Edited a book* for Springer (http://www.springer.com/gb/book/9783319179711) .

Publications

Articles

These are only papers published within the last employment (since 2013) or cited at least 50 times. My overall citation count is 3,407 and h-index is 23, as given by Google Scholar on 10Dec2019: https://scholar.google.co.uk/citations?hl=en&user=hGLjJ-kAAAAJ

Articles published during current employment (2013-2019)

Fewings E, … **Larionov** A *et al* (**2019**) Malta (MYH9 Associated Elastin Aggregation) Syndrome: Germline Variants in MYH9 Cause Rare Sweat Duct Proliferations and Irregular Elastin Aggregations. *J Invest Dermatol.* https://doi.org/10.1016/j.jid.2019.03.1151 **Cited 1 time**

Larionov AA (**2018**) Current therapies for human hpidermal growth factor receptor 2-positive metastatic breast cancer patients. *Front Oncol.* 8:89, https://doi.org/10.3389/fonc.2018.00089 **Cited 23 times**

Fewings E, **Larionov** A *et al* (**2018**) Germline pathogenic variants in PALB2 and other cancer-predisposing genes in families with hereditary diffuse gastric cancer without CDH1 mutation: a whole-exome sequencing study. *Lancet Gastroenterol Hepatol.* https://doi.org/10.1016/S2468-1253(18)30079-7 **Cited 14 times**

Flageng MH, **Larionov** A, *et al* (**2017**) Treatment with aromatase inhibitors stimulates the expression of epidermal growth factor receptor-1 and neuregulin 1 in ER positive/HER-2/neu non-amplified primary breast cancers. *J Steroid Biochem Mol Biol*. https://doi.org/10.1016/j.jsbmb.2016.06.011 **Cited 4 times**

Toi M, … **Larionov** A, *et al* (**2015**) Personalization of loco-regional care for primary breast cancer patients. *Future Oncol*. https://doi.org/10.2217/fon.15.65 and https://doi.org/10.2217/fon.15.66 (parts 1 and 2) **Cited 5 times**

Turnbull AK, ... **Larionov** AA, *et al* (**2015**) Accurate prediction and validation of response to endocrine therapy in breast cancer. *J Clin Oncol*. https://doi.org/10.1200/JCO.2014.57.8963 **Cited 66 times**

López-Knowles E ... **Larionov** A *et al* (**2015**) Integrative analyses identify modulators of response to neoadjuvant aromatase inhibitors in patients with early breast cancer. *Breast Cancer Res*. https://doi.org/10.1186/s13058-015-0532-0 **Cited 7 times**

Arthur LM, ... **Larionov** AA, et al (**2014**) Molecular changes in lobular breast cancers in response to endocrine therapy. *Cancer Res*. https://doi.org/10.1158/0008-5472.CAN-14-0620 **Cited 25 times**

Sokolenko AP, ... **Larionov** AA, *et al* (**2014**) High prevalence of GPRC5A germline mutations in BRCA1-mutant breast cancer patients. *Int J Cancer*. https://doi.org/10.1002/ijc.28569 **Cited 19 times**

Kuligina ESh, … **Larionov** AA, *et al* (**2013**) Value of bilateral breast cancer for identification of rare recessive at-risk alleles: evidence for the role of homozygous GEN1 c.2515_2519delAAGTT mutation. *Fam Cancer* https://doi.org/10.1007/s10689-012-9575-x **Cited 19 times**

Most cited earlier articles (published before 2013, cited at least 50 times)

Miller WR & **Larionov** AA (**2012**) Understanding the mechanisms of aromatase inhibitor resistance. *Breast Cancer Res.* https://doi.org/10.1186/bcr2931 **Cited 76 times**

Sokolenko AP, ... **Larionov** AA, *et al* (**2012**) High prevalence and breast cancer predisposing role of the BLM c.1642 C>T (Q548X) mutation in Russia. *Int J Cancer*. https://doi.org/10.1002/ijc.26342 **Sited 64 times**

Hrstka R, … **Larionov** A *et al* (**2010**) The pro-metastatic protein anterior gradient-2 predicts poor prognosis in tamoxifen-treated breast cancers. *Oncogene*. https://doi.org/10.1038/onc.2010.228 **Cited 95 times**

Miller WR & **Larionov** A (**2010**) Changes in expression of oestrogen regulated and proliferation genes with neoadjuvant treatment highlight heterogeneity of clinical resistance to the aromatase inhibitor, letrozole. *Breast Cancer Res*. https://doi.org/10.1186/bcr2611 **Cited 61 times**

Creighton CJ, … **Larionov** AA *et al* (**2009**) Residual breast cancers after conventional therapy display mesenchymal as well as tumor-initiating features. *PNAS* https://doi.org/10.1073/pnas.0905718106 **Cited 1,170 times**

Miller WR, **Larionov** A *et al* (**2009**) Gene expression profiles differentiating between breast cancers clinically responsive or resistant to letrozole. *J Clin Oncol.* https://doi.org/10.1200/JCO.2008.16.8849
    Cited 100 times

Miller WR, **Larionov** A *et al* (**2007**) Changes in breast cancer transcriptional profiles after treatment with the aromatase inhibitor, letrozole. *Pharmacogenet Genomics*. https://doi.org/10.1097/FPC.0b013e32820b853a
    Cited 94 times

Mackay A, … **Larionov A** *et al* (**2007**) Molecular response to aromatase inhibitor treatment in primary breast cancer. *Breast Cancer Res*. https://doi.org/10.1186/bcr1732 **Cited 117 times**

Larionov A *et al* (**2005**) A standard curve based method for relative real time PCR data processing. *BMC Bioinformatics* https://doi.org/10.1186/1471-2105-6-62 **Cited 769 times**

Tomlinson VAL, … **Larionov** A et al (**2005**) Translation elongation factor eEF1A2 is a potential oncoprotein that is overexpressed in two-thirds of breast tumours. *BMC Cancer*. https://doi.org/10.1186/1471-2407-5-113
    Cited 163 times

Larionov A *et al* (**2003**) Aromatase in skeletal muscle. *J Steroid Biochem Mol Biol.* https://doi.org/10.1016/S0960-0760(03)00059-1 **Cited 67 times**

Berstein L, ... **Larionov** A *et al* (**2002**) Neoadjuvant therapy of endometrial cancer with the aromatase inhibitor letrozole: endocrine and clinical effects. *Eur J Obstet Gynecol Reprod Biol*. https://doi.org/10.1016/S0301-2115(02)00147-1 **Cited 78 times**

Book chapters

Larionov A (**2016**) Novel translational research of neo-adjuvant endocrine therapy. Chapter in *Personalized Treatment of Breast Cancer*. Editors: Masakazu Toi, Eric Winer, John Benson, Suzanne Klimberg. Springer, ISBN: 978-4-431-55551-3

Larionov A & Miller WR (**2015**) Prediction of Response to Aromatase Inhibitors in Breast Cancer. Chapter in *Resistance to Aromatase Inhibitors in Breast Cancer*. Editor: Alexey A Larionov, Series: *Resistance to Targeted Anti-Cancer Therapeutics*. Springer, ISBN: 978-3-319-17971-1

Sims A, **Larionov** A, *et al*. (**2013**) Use of microarray analysis to investigate EMT gene signatures. Chapter in *Adhesion Protein Protocols*. Editor Amanda S. Coutts, Springer ISBN 978-1-62703-538-5

Book edited

A. Larionov (editor) (**2015**) Resistance to aromatase inhibitors in breast cancer.
    Springer, ISBN: 978-3-319-17971-1

Conference talks

Larionov A (**2014**) Recent findings from translational research of neoadjuvant endocrine therapy. Invited lecture. Kyoto Breast Cancer Consensus Conference, 20-22 February 2014, **Kyoto, Japan**

Larionov A (**2013**) An invited faculty member for biomarker discovery panel discussion. Controversies in Breast Cancer conference, 9-10 February 2013, **Kolkata, India**

Larionov A (**2010**) Molecular heterogeneity of endocrine resistance in breast cancer: profiling of clinical specimens. Oral presentation in BIT Life Sciences' 3rd World Cancer Congress-Breast Cancer Conference: 25-27April 2010, **Shanghai, China**

Larionov A *et al* (**2007**) Reproducibility and interpretation of quantitative gene expression measurements in breast cancer biopsies. Oral presentation in the 10th Nottingham International Breast Cancer Conference, 18 – 20 September, 2007, **Nottingham, UK**

Larionov A *et al* (**2004**) Data processing in real time PCR. Oral presentation in the 1st International qPCR Symposium & Application Workshop Transcriptomics, Clinical Diagnostics & Gene Quantification, 3rd - 6th March, 2004, **Freising-Weihenstephan, Germany**