# CV and publications of Dr. Alexey Larionov

*PhD in Molecular Oncology, MSc in Bioinformatics, PgCert in Academic Practices, Bachelor in 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 servers, HPC clusters, 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.

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.

My pipelines for WES data analysis (from FASTQ to VCF) have been used for 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. Over the last 5 years I implemented my pipelines 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). 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.

During the current employment I contributed to several well cited papers in reputable journals (see publications within last 5 years) 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, I continue publishing and teaching about hormonal and targeted treatments in breast cancer (carrying over from the previous job in Edinburgh University). Also, I supervise MSc projects and mark theses for MPhil Genomic Medicine course in Cambridge, I teach in Endocrine Physiology and Pharmacology Honors course in Edinburgh University (lecturing and exam marking); and I am a Fellow of The Higher Education Academy (UK).

My academic activities also include reviewing and editing: I reviewed for BMC Bioinformatics, Genome Medicine, Pharmaceutical Statistics and other journals and 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 ).

## 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 predict response and understand mechanisms of resistance to aromatase inhibitors (a modality of hormonal treatment) in breast cancer. Specific tasks 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 in the research group
- Preparation of publications, grant applications and presenting results on international meetings

I reported the results obtained in that employment in multiple well cited papers and scientific meetings (see list of publications). 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).

***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 qPCR:

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

During that employment I performed qPCR analysis on hundreds of samples for tens of genes pre-selected from 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, 2006).

***2001 – 2002***

**Clinical Research Associate**

PSI Pharma Support Inc., St. Petersburg, Russia

Monitoring patients' well-being and regulatory compliance in a breast cancer clinical trial.

***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 tissues and in other peripheral tissues. Resulted into two well-cited 1-st author publications.

***1992 – 1999***

**Postgraduate student** (Medical oncology) then **PhD student** (Molecular 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 experimental oncology** – as 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; *Edited a book* for Springer about endocrine resistance in breast cancer (http://www.springer.com/gb/book/9783319179711 ) .

## Publications

### Articles

These are only papers published within the last 5 years or cited at least 50 times. Citation counts are given by Google Scholar 28May2019: https://scholar.google.co.uk/citations?hl=en&user=hGLjJ-kAAAAJ.

**Papers within last 5 years:**

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. *Journal of Investigative Dermatology* doi:10.1016/j.jid.2019.03.1151

**Larionov** AA (**2018**) Current therapies for human hpidermal growth factor receptor 2-positive metastatic breast cancer patients. *Front. Oncol.* 8:89, doi:10.3389/fonc.2018.00089. **Cited 12 times**

Fewings E, **Larionov** A *et al* (**2018**) Whole exome sequencing to detect germline pathogenic variants in PALB2 and other cancer-predisposing genes in CDH1 mutation negative diffuse gastric cancer families. *The Lancet Gastroenterology & Hepatology,* doi:10.1016/S2468-1253(18)30079-7 **Cited 8 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*. 165:228, PMID: 27343990. **Cited 4 times**

Toi M, … **Larionov** A, *et al* (**2015**) Personalization of loco-regional care for primary breast cancer patients. *Future Oncol*. 11:1297, PMID: 25952777 and 25952778 (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*. 33:2270, PMID: 26033813 **Cited 54 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*. 17:35, PMID: 25888249 **Cited 6 times**

Arthur LM, ... **Larionov** AA, et al (**2014**) Molecular changes in lobular breast cancers in response to endocrine therapy. *Cancer Res*. 74:5371, PMID: 25100562 **Cited 22 times**

Sokolenko AP, ... **Larionov** AA, *et al* (**2014**) High prevalence of GPRC5A germline mutations in BRCA1-mutant breast cancer patients. *Int J Cancer*. 134:2352, PMID: 24470238. **Sited 19 times**

**Most cited earlier papers**

Miller WR and **Larionov** AA (**2012**) Understanding the mechanisms of aromatase inhibitor resistance. *Breast Cancer Res* 14:201 PMID: 22277572, **Cited 72 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*. 130:2867, PMID: 21815139. **Sited 57 times**

Hrstka R, … **Larionov** A *et al* (**2010**) The pro-metastatic protein anterior gradient-2 predicts poor prognosis in tamoxifen-treated breast cancers. *Oncogene*. 29(34):4838-4847. PMID: 20531310, **Cited 86 times**

Miller WR and **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*. 12:R52 PMID: 20646288, **Cited 58 times**

Creighton CJ, … **Larionov** AA *et al* (**2009**) Residual breast cancers after conventional therapy display mesenchymal as well as tumor-initiating features. *PNAS* 106(33):13820-13825 PMID: 19666588, **Cited 1099 times**

Miller WR, **Larionov** A *et al* (**2009**) Gene expression profiles differentiating between breast cancers clinically responsive or resistant to letrozole. *J Clin Oncol* 27:1382 PMID: 19224856 **Cited 98 times**

Miller WR, **Larionov** A *et al* (**2007**) Changes in breast cancer transcriptional profiles after treatment with the aromatase inhibitor, letrozole. *Pharmacogenetics and Genomics*. 17:813 PIMD: 17885619, **Cited 88 times**

Mackay A, … **Larionov A** *et al* (**2007**) Molecular response to aromatase inhibitor treatment in primary breast cancer. *Breast Cancer Research*. 9(3):14. PMID: 17555561, **Cited 114 times**

**Larionov** A *et al* (**2005**) A standard curve based method for relative real time PCR data processing. *BMC Bioinformatics* 6:62 PMID: 15780134, **Cited 731 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*. 5:7. PMID: 16156888, **Cited 155 times**

**Larionov** A *et al* (**2003**) Aromatase in skeletal muscle. *J Steroid Biochem Mol Biol* 84:485 PMID: 12732294, **Cited 65 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*. 105:161, PMID: 12381480, **Cited 74 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**