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FRANCE

# Dr. Pierre Martinez

Bioinformatics of Cancer Evolutionary Dynamics

**Nationality**: French
**Birth date:** July 6th 1984

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## EDUCATION

2008-2011 **PhD** under the supervision of Prof. Franca Fraternali (Randall Division of Cell and Molecular Biophysics, King's College London, England).
"Computational Analysis of Transcription Factors Cooperation and Protein-Protein Interactions Structural Features". *CASE Award (EPSRC)* in collaboration with the Nestlé Research Centre (Dr James Holzwarth, Lausanne, Switzerland).

2007 **Master in Bioinformatics**
Sardegna Ricerche, Pula, Italy.

2001-2006 **Master in Information Technology**
EPITECH, Paris, France.

## WORK EXPERIENCE

2018- **Chargé de Recherche (Permanent PI position)**
Inserm / Cancer Research Centre of Lyon, France.
Analysis of cancer evolution and diversity.

2016-2018 **Assistant Scientist**
Cancer Research Centre of Lyon / Centre Léon Bérard, Lyon, France.
Analysis of clonal evolution of tumours.

2014-2016 **Post-doctoral Research Assistant**
Evolution and Cancer, Dr Trevor Graham's lab, Barts Cancer Institute, Queen Mary University, London, UK.
Analysis of evolutionary processes and dynamics in tumours and pre-malignant conditions.

2011-2013 **Post-doctoral Research Assistant**
Translational Cancer Therapeutics, Prof. Charles Swanton's lab, Cancer Research UK, London, UK.
Analysis of intra-tumour heterogeneity and chromosomal instability.

## AWARDS AND PRIZES

**Barts Cancer Institute & School of Medicine and Dentistry travel grants** awarded to attend IBECC 2016 in San Francisco, December 2016.
**Wellcome Trust travel grant** awarded to attend the Forecasting evolution conference in Lisbon, July 2015.
**Jass prize for best article in the Journal of Pathology** for the manuscript *Parallel evolution of tumor subclones mimics diversity between tumors* (2013), awarded in January 2015.
**EMBO short-term fellowship** awarded for a two-months stay with the Cancer Systems Biology group at the Technical University of Denmark, October 2014.
**Prize for best scientific oral presentation** at Research Progress in Barrett's Oesophagus 8th National Meeting, April 2014.
**Jenny Fordham prize for fun and enthusiasm in the Randall Division** for organizing informal scientific meetings amongst PhD students, July 2009.

## SELECTED PUBLICATIONS

**(Ψ for corresponding authors, * for joint-first authors)**

Coutant A, Cockenpot V, Muller L, […], **Martinez P$^{\Psi}$**. Spatial transcriptomics reveal pitfalls and opportunities for the detection of rare high-plasticity breast cancer subtypes. *Submitted,* 2023.

Monteiro L, Da Silva L, Lipinski B, […], **Martinez P$^{\Psi}$**. Assessing Cell Activities rather than Identities to Interpret Intra-Tumor Phenotypic Diversity and Its Dynamics. *iScience,* 2020.

Tokutomi N, Moyret-Lalle C, Puisieux A, Sugano S, **Martinez P$^{\Psi}$**. Quantifying the fitness of tissue-specific evolutionary trajectories by harnessing cancer's repeatability at the genetic level. *Evolutionary Applications,* 2019.

**Martinez P**, Mallo D, Paulson P, Li X, Sanchez C, Reid B, Graham TA, Kuhner M, Maley CC. Evolution of Barrett's Esophagus through space and time at single-crypt and whole-biopsy levels. *Nature Communications, 2018*.

**Martinez P$^{\Psi}$,** Kimberley C, Birkbak N, Marquard M, Szallasi Z, Graham TA. Quantification of within-sample genetic heterogeneity from SNP-array data. *Scientific Reports,* 2017.

**Martinez P***, Timmer MR*, […] Maley CC, Graham TA, Krishnadath KK. Dynamic clonal equilibrium and predetermined cancer risk in Barrett's oesophagus. *Nature Communications,* 2016.

Timmer MR*, **Martinez P***, […] Maley CC, Graham TA, Bergman JJ, Krishnadath KK. Derivation of genetic biomarkers for cancer risk stratification in Barrett's Oesophagus: a prospective cohort study. *Gut,* 2015.

Kanu N*, Grönroos E*, **Martinez P***, Burrell RA, Goh XY, […], Swanton C. SETD2 loss of function promotes DNA replication stress and renal cancer genome instability. *Oncogene,* 2015**.**

**Martinez P**, Graham T. Evolution and cancer. Book chapter from *Why does Evolution Matter? The Importance of Understanding Evolution*, Cambridge Scholars, 2014.

**Martinez P**, McGranahan N, Birkbak NJ, Gerlinger M, Swanton C. Computational optimisation of targeted DNA sequencing for cancer detection. *Scientific Reports*, 2013.

**Martinez P***, Birkbak NJ*, Gerlinger M*, McGranahan N, Burrell RA, Rowan AJ, Joshi T, Fisher R, Larkin J, Szallasi Z, Swanton C. Parallel evolution of tumor subclones mimics diversity between tumors. *The Journal of Pathology*, 2013.

Gerlinger M*, Rowan AJ*, Horswell S*, Larkin J*, Endesfelder D*, Gronroos E*, **Martinez P***, Matthews N*, Stewart A*, […], Swanton C. Intratumor heterogeneity and branched evolution revealed by multiregion sequencing. *New England Journal of Medicine*, 2012.

## OTHER PUBLICATIONS

Gatenbee C, Baker AM, Schenck R, […], **Martinez P**, […], Graham TA, Anderson, AR. Immunosuppressive niche engineering at the onset of human colorectal cancer. *Nature Communications*, 2022.

Truchard E, Bertolus C, **Martinez P**, Thomas E, Saintigny P, Foy JP. Identification of a Gene-Expression-Based Surrogate of Genomic Instability during Oral Carcinogenesis. *Cancers*, 2022.

Pommier RM, Sanlaville A, Tonon L, Kielbassa J, Thomas E, Ferrari A, Sertier AS, Hollande F, **Martinez P**, Tissier A, Morel AP, Ouzounova M & Alain Puisieux. Comprehensive characterization of claudin-low breast tumors reflects the impact of the cell-of-origin on cancer evolution. *Nature Communications,* 2020.

Roche B, **Martinez P**. Separating the Local and Malignant Dimensions of Cancer Adaptation. *Cancer Informatics,* 2019.

Cross WCH, Kovac M, Mustonen V, Temko D, Davis H, Baker AM, […], **Martinez P**, […], Sottoriva A, Leedham SJ, Graham TA, Tomlinson IPM and The S:CORT Consortium. The evolutionary landscape of colorectal tumorigenesis. *Nature Ecology & Evolution*, 2018.

Uchuya-Castillo J, Aznar N, Frau C, **Martinez P**, […], Plateroti M. Increased expression of the thyroid hormone nuclear receptor TRα1 characterizes intestinal tumors with high Wnt activity. *Oncotarget*, 2018

Baker AM, Cross W, Curtius K, Al Bakir I, Choi CR, […], **Martinez P**, […], Hart AL, Leedham SJ, Graham TA. Evolutionary history of human colitis-associated colorectal cancer. *Gut*, 2018.

DL Lavery, **P Martinez**, LJ Gay, B Cereser, MR Novelli, M Rodriguez-Justo, [...], Jansen M. Evolution of oesophageal adenocarcinoma from metaplastic columnar epithelium without goblet cells in Barrett's oesophagus *Gut*, 2015.

Gulati S, **Martinez P**, Joshi T, […], Bates PA, Swanton C, Gerlinger M. Systematic Evaluation of the Prognostic Impact and Intratumour Heterogeneity of Clear Cell Renal Cell Carcinoma Biomarkers. *European Urology*, 2014.

Gerlinger M, Horswell S, Larkin J, Rowan AJ, Salm MP, […] **Martinez P**, […], Swanton C. Genomic architecture and evolution of clear cell renal cell carcinomas defined by multiregion sequencing. *Nature Genetics*, 2014.

Pagano B, Jama A, **Martinez P**, Akanho E, Bui T, Drake A, Fraternali F, Nikolova P. Structure and stability insights into tumour suppressor p53 evolutionary related proteins. *PLoS One,* 2013.

Gerlinger M, Santos CR, Spencer-Dene B, **Martinez P**, […], Swanton C. Genome-wide RNA interference analysis of renal carcinoma survival regulators identifies MCT4 as a Warburg effect metabolic target. *The Journal of Pathology*, 2012.

Fornili A, Autore F, Chakroun N, **Martinez P** and Fraternali F. Protein-water interactions in MD simulations: POPS/POPSCOMP solvent accessibility analysis, solvation forces and hydration sites. Book chapter from *Computational Drug Discovery and Design*, Springer Protocols 2012*.*

## TEACHING

**Lectures on Evolutionary trajectories in cancer**, Master 2 de Cancérologie, Université Paris Saclay: 2h per year (2020-).
Demonstrations for **structural bioinformatics courses**, undergraduates King's College London: 6 hours (2009).
**Lectures on cancer evolution**, year 1 medical students Queen Mary University of London: 1 hour per year (2014-2016).
**Problem-based learning**, Human Science and Public Health module, year 2 medical students, Queen Mary university of London: 14 hours (2016).
Supervision of **7 Master students** in Bioinformatics and **2 undergraduate students** (laboratory technicians).
Main supervisor of **1 PhD student** (started November 2020).

## SCIENTIFIC COMMUNICATIONS

Member of the "**Technological Innovations for Health**" commission for the regional *Cancéropôle Lyon Auvergne Rhône Alpes* Scientific Committee, 2022.
Member of the organising committee for the **Dynamics and statistics of cancer evolution workshop**, Marseille, France, June 2022.
Member of the organising committee for the "**Mathematical Models of Cancer Evolution and Ecology**" symposium during the Mathematical Models of Evolution and Ecology conference, Lyon, France, July 2019.
Member of the organising committee for the **3rd International Symposium of the Cancer Research Centre of Lyon,** Lyon, France, September 2017**.**

**RECOMB Satellite Workshop on Computational Cancer Biology**, 2023 Istanbul, Turkey. Spatial transcriptomics reveal pitfalls and opportunities for the detection of rare high-plasticity breast cancer subtypes. *Contributed talk.*
**Hétérogénéité tumorale : du séquençage de l'ADN aux applications cliniques**, 2023, Société Française du Cancer, Paris, France : "Quantification de l'hétérogénéité intra-tumorale". *Invited talk.*
**CRCL International symposium**, 2019, Lyon, France: "Harnessing cancer's repeatability at the genetic level". *Contributed talk*.
**IARI symposium**, March 2019, Tokyo, Japan: "Harnessing cancer's repeatability at the genetic level". *Invited speaker*.
The **Cancer Mosaic, Traits, Strategies and Adaptations Workshop**, August 2018, Montpellier, France: "Mapping pre-neoplastic development using contingency-based fitness". *Invited speaker*.
**International Society for Evolution, Ecology and Cancer Conference,** Tempe AZ, USA, 2017: "Evolution of Barrett's Esophagus through space and time at whole-biopsy and single-crypt levels". *Contributed talk.*
**Systems Biology Conference,** November 2016, Lyon, France: "Quantification of within-sample genetic heterogeneity from SNP-array data". *Poster.*
**European Conference on Mathematical and Theoretical Biology,** July 2016, Nottingham, UK: "Predetermined malignant potential in Barrett's Oesophagus". *Invited speaker (satellite meeting).*
**Nottingham Pathology 2016,** June 2016, Nottingham, UK: "Predetermined malignant potential in Barrett's Oesophagus". *Contributed talk.*

**Research Progress in Barrett's Oesophagus 9th National Meeting**, April 2016, London, UK: "Measuring and modelling evolutionary clonal dynamics in Barrett's Oesophagus to predict cancer risk". *Contributed talk.*
**From gene to phenotype: recent advances in biology and medicine workshop,** March 2016, Warsaw, Poland. "Pan-cancer analysis of intratumoral heterogeneity". *Invited Speaker.*
**Third International Biannual Evolution and Cancer Conference,** December 2015, San Francisco, USA: "Predetermined malignant potential in Barrett's Oesophagus". *Contributed talk.*
**Cancer Research Centre of Toulouse seminar**, November 2015, Toulouse, France: "Quantifying cancer evolution and intratumour heterogeneity". *Invited speaker.*
**National Cancer Research Institute (NCRI) Cancer Conference,** November 2015, Liverpool, UK: "Longitudinal single cell clonal analysis reveals evolutionary stasis and predetermined malignant potential in non-dysplastic Barrett's Oesophagus". *Contributed talk.*
**Forecasting Evolution Conference,** July 2015, Lisbon, Portugal:
"Single-cell genetics and evolution of clonal diversity by multicolor FISH analysis in Barrett's esophagus". *Poster.*
**Evolution and Cancer Conference,** Mars 2015, Montpellier, France:
"Tracking clonal evolution over time in Barrett's Oesophagus". *Invited speaker.*
**Research Progress in Barrett's Oesophagus 8th National Meeting**, April 2014, London, UK:
"Measuring the pattern of clonal evolution in Barrett's Oesophagus using single-cell FISH data in a large longitudinally-followed cohort". *Contributed talk.*
**Second International Biannual Evolution and Cancer Conference**, June 2013, San Francisco, USA:
"Parallel evolution of tumor subclones mimics diversity between tumors". *Poster*.
**European Conference of Computational Biology**, September 2010, Ghent, Belgium:
"Computational analysis of transcription factor binding co-localization". *Poster*.

## FUNDING

Projects
2022: Institut National du Cancer « PL-BIO ». Project and Team 1 manager, €224k (412k total).
2021: Institut National du Cancer « PREVBIO ». Team 1 co-manager, €367k (415k total).
2020: Cancéropôle Lyon Auvergne Rhône Alpes « Oncostarter numérique ». Project manager, €40k.
2019: Plan Cancer Single-Cell. Project manager, €360k.
2019: Plan Cancer Maths, Informatics & Cancer. Team 2 manager, €370k (570k total).

Other
2022: Ligue Nationale Contre le Cancer « Subvention colloque » (2,375€).
2019: Cancéropôle Lyon Auvergne Rhône Alpes « Soutien aux manifestations scientifiques » (1,000€).